

Introduction to Emergent Math Lessons

This resource is designed to assist you in providing math instruction to students who are emergent learners in math. These students are most likely still working on developing their attention during instruction, mode of communication, engagement during instruction, and underlying math concepts.

When providing instruction to emergent learners, the most important thing to remember is to provide high quality modeling and the opportunity for students to engage, respond, and develop their thinking skills. Adults in the classroom should refrain from completing the tasks for the student. If a student does not respond, use this as an opportunity to experiment with light, sound, touch, and movement to engage the student in the task. Provide a fun and engaging learning environment. Use math instruction as another opportunity to improve communication.

The lessons are organized into the following categories: Attributes, Set/Separateness, Patterns, Composing/Decomposing, and Part/Whole. Within each category, the lessons are then divided into Initial Precursor lessons and Distal Precursor lessons.

Information you provide during the First Contact Survey or through observations you make during instruction will help you determine which set of lessons you should begin. Generally, students who have little or no ability to communicate or are just beginning to use the Core Vocabulary will begin with the Initial Precursor level. Most of the lessons focus on teacher modeling and opportunities to seek engagement from the student. The skills and concepts relate to foundational skills that can apply across subjects/content areas. Students who have shown some success with the Core Vocabulary and are developing their initial math and communication skills should be provided instruction at the Distal Precursor level. These lessons focus on more math related concepts and skills, but the teacher will continue to provide large amounts of modeling during instruction.

Each lesson is laid out in the following order.

Purpose: The learning targets as well as Essential Elements are described in this section. Most lessons address Essential Elements at multiple grade levels within a grade band. This will allow teachers to provide instruction to small groups that include students at different grade levels.

Materials: All materials required for the lesson will be listed here. Hyperlinks to materials made specifically for the lesson as well as outside links to other resources are also provided. In the case of concrete materials, links for purchasing or referencing those materials are also listed.

Anchor Activity: This is an opportunity to build background knowledge or connect to previous lessons. The teacher will also state the purpose of the lesson and teach/model the concepts/skills.

Think and Do: The student will be presented with an activity similar to the one modeled by the teacher during the Anchor Activity. The student will complete the activity as independently as possible with little to no adult direction.

Apply: During this phase, the student will have the opportunity to communicate their thinking strategies and receive feedback from the teacher.

Teacher/Student Actions: Directions are stated in black. Teacher comments are denoted in **purple bold**, and possible student comments are denoted in **teal bold**.

AAC Suggestions: This column includes the words from [36 Location Universal Core Communication Board](http://www.project-core.com/36-location/) that can be modeled for students during instruction. (<http://www.project-core.com/36-location/>)

Notes: This column provides links and Think Abouts when providing the instruction that may be specific to certain parts of the lesson. Examples include how to modify for students with vision or physical limitations or ways to progress through future lessons on the same topic.

Resources are also provided for Formative Assessment. This can be found at the bottom of each lesson plan or in the main topic folder. A copy can be made for each student for each topic area. This provides a way to track how the student is progressing in regards to responses and accuracy. This may be used as a way to create an IEP goal and/or progress monitoring.

**EMERGENT SET 3
(HS Target EEs)**

Attribute Lesson Plans



Initial Precursor

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Complete Shared Reading of the book below to introduce the concept of pairs https://shared.tarheelreader.org/shared/read/animals-in-pairs</p> <p>Refer to examples on the student (e.g. shoes, arms, eyes, legs, etc.) and/or the animals looking alike and doing similar things and use the word pair</p>	<p>*Note: The shared reading link has a core vocab bar across the bottom and suggestions for comments in the top left corner.</p>	<p>*Note: The shared reading link has a core vocab bar across the bottom and suggestions for comments in the top left corner.</p> <p>Visually impaired students will need a braille version or a large tactile version.</p> <p>PAIR vocabulary card is available in the folder PAIR vocabulary card https://docs.google.com/document/d/10I3yrQiVYWC2O8kEKjsPISWRldhm2kZqrZvle_fPWE/edit)</p>
<p>Establish a purpose</p> <p>Say: "We put things in pairs to organize them. We look at their attributes (color, shape, size, amount) to help us put them in pairs. Today we will put things in pairs."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Same</p>	
<p>Teach and model the concept</p> <p>Place the two highlighters and the two notebooks (not paired up) on the table along with the Blank T-Chart.</p> <p>"I see two highlighters and two notebooks. The highlighters are yellow and look like cylinders. There are two of them. When we have two of the same thing we have a pair. I can organize them on this T-chart." Model placing one highlighter in each box across from each other.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Same, put, here, on, it</p>	<p>Visually impaired students will need to touch the items as you describe them to allow for them to make connections.</p> <p>This is an opportunity to gain joint attention through using the items in novel ways, or</p>

<p>"I also see two notebooks. They are both rectangular and black with spirals on top."</p> <p>*Note: <i>Fit your description to the items you have.</i></p> <p>"There are two of them that are the same. When we have two of the same thing we have a pair. I can organize these on the T-chart." Model placing one notebook in each box across from each other.</p> <p>You may repeat this with another set of items.</p>		<p>using movement, sound, touch, or light.</p>
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place two sets of pairs (not already paired together) in front of the student along with the T-chart.</p> <p><u>Say:</u> "Put these items in pairs on the T-chart like I did with the highlighters and notebooks."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Put, here</i></p>	<p>Provide ample wait time based on your knowledge of the student's needs.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should place the items in pairs on the T-chart.</p>		<p>There should be no adult coaching at this time other than prompts to complete the task if necessary.</p> <p>Note on the Formative Assessment document how the student performed.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "Tell me how you chose to pair them like that."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>It, here, same, different, look, on</i></p>	<p>Allow ample wait time. Refrain from commenting at this time.</p>

<p>Get feedback</p> <p>Refer to your model and do a Think Aloud to compare the student's work to the correct answer or model.</p> <p>Example: "I see you looked at each item and found the second item that looked like the first. You found two different pairs. In each pair are two items that looked alike."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Same, different, look</p>	<p>This is time to compare against the model as a way to re-teach the concept.</p>
<p>Make explicit what the students were thinking and doing</p> <p>Explain how you saw the student work through the problem. For example: "I saw you look at the items and note that these two had the same color (shape, etc.). Then you put them next to each other in the T-chart because they were the same. You made a pair."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Same, different</p>	<p>Describe the thought process rather than re-teach at this point. Think about how the student arrived at the answer, rather than what answer the student arrived at.</p>
<p>Formative Assessment (option)</p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Classify Objects



Purposes

Students will develop understanding of words that describe to group items and then represent them on a simple graph.

This is lesson 1 of 2.

- Lesson 2 is available here:
 - **IP: HS Order Objects**
https://docs.google.com/document/d/1SulcA9GX5fq5N0nHPFjp6k_sKuEVsaHx9HEGrb6gQil/edit
- **M.EE.S-ID.1-2** Given data, construct a simple graph (table, line, pie, bar, or picture) and interpret data.
- **M.EE.S-ID.3** Interpret general trends on a graph or chart

Materials

- Items that can be grouped together based on attributes - Refer to the collections list for the appropriate grade level found here:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- **Blank bar graph.** If you need a template, find one here:
<https://www.timvandevall.com/templates/blank-bar-graph-template/>
- CORE vocabulary board and/or AAC device for each student
- Copy of the Formative Assessment for the student
- For this example lesson: 2 identical balls, 2 identical envelopes, 3 clothespins, 3 highlighters

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
Activate prior knowledge or build new knowledge For each item, allow the student to look at, touch, and manipulate the items while the adult describes the item (attempt to elicit descriptors from the student) and its uses.	Model using student's form of communication. For example: AAC, Braille, signing.	This step is very important to allow the student to explore items that might be novel. This will help the student be

<p>For example: "This is a ball. We use it to play. It is round"</p>	<p><i>Look, on, here, same, different, turn, that</i></p>	<p>focused during the instruction.</p> <p>It also allows the teacher to work on joint attention for students who are still struggling in this area. Use movement, light, sound, intonation of voice to gain attention.</p> <p>Opportunities for language development and practice with finding words in their AAC device beyond the Core vocabulary are also provided during this time.</p>
<p><i>Establish a purpose</i></p> <p>"Today we will organize these things based on their attributes, then make a graph to show how we classified them."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Same, different, look, on</i></p>	
<p><i>Teach and model the concept</i></p> <ul style="list-style-type: none"> Remove all items except for 3 clothespins and 2 balls. Place the items in a group. Model a Think Aloud as you group them based on an attribute. "I see that all these (clothespins) are straight and these are round (balls). I can put all of the clothespins in one group and all of the balls in another group because they are different. I have organized my things into groups." Model making a bar graph by labeling the side with the item names, then counting the items in each group. "There are 1-2-3" 	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, same, here, on, it</i></p>	<p>For students who are visually impaired, provide a tactile version of the graph. Ex: Place the items on a larger form of the graph.</p> <p>Picture cards are provided in the folder.</p>

<p>clothespins. I will color in one block for each clothespin to show how many clothespins I have. There are 1-2 balls. I will color in one block for each ball that I have. I have organized and classified my things. I made the bar graph so I can show others how many I have and I can compare the groups."</p> <ul style="list-style-type: none"> • Repeat once or twice more with other items. 		
THINK AND DO		
<p><i>Students think about what to do:</i></p> <ul style="list-style-type: none"> • <i>(Part 1)</i> Place 2 envelopes and 3 highlighters (make sure they are not already grouped) in front of the student. • Direct the student to look at the items and put them in a group based on an attribute they choose. "Here are some envelopes and highlighters. Organize them in two different groups." • <i>(Part 2)</i> Once the items have been organized, provide feedback on this portion of the activity as described in the apply section for lesson part 1. • Then provide the student with a blank (or partially filled in with labels) bar graph template. • <i>Say:</i> "Now let's make a bar graph to classify your objects into groups. Which group would you like to graph first?" • Wait for student to indicate his/her choice. <i>(See notes about choice making.)</i> • "How should we label that group?" You may provide two choice cards, one labeled with a picture and a word for "envelope" and one with a picture and word for highlighter. <i>(See folder for graphics.)</i> • How many do we have? • Which boxes should we color in? • Repeat for the second group. 	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Some, put</i></p>	<p>You may offer a template (two circles or squares) that gives them a specific area in which to place each set of items.</p> <p>If the student does not make a choice, use this as an opportunity to work on joint attention and choice making. Use light, sound, and movement to gain attention to the choices. Repeat the direction to make a choice. At the first indication of making a movement or sound, connect that to the choice you believe the student was indicating. In other words, attribute meaning to their vocalization or movement.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model 		<p>Allow processing time. Student may use pointing, eye gaze,</p>

<ul style="list-style-type: none"> Find the matching shapes Put them in order Interpret the data, etc. Describe/share answer <ul style="list-style-type: none"> (Part 1) Allow the student to group the items according to his/her choice. If there is no response from the student after additional prompts to begin, move on to the Apply portion of the lesson and use Think Aloud/modeling. (Part 2) If the student does not make a choice for any of the questions above, provide wait time, prompt again, provide more wait time, and then if there is still no response, complete a Think Aloud for only that question before moving on to the next question. <i>(See notes for another option when student does not make a choice.)</i> Example Think Alouds: "I will choose to graph the envelopes first. First I count them, 1-2, and then I color one box for each envelope above the label on the graph, 1 (color) and 2 (color). Then I need to graph the highlighters. First I count the highlighters. 1-2-3 highlighters. Then I color one box for each highlighter above the highlighter label on the graph. 1 (color) - 2 (color) - 3 (color) . My graph is done." 		<p>touching, peer assisted scanning, etc.</p> <p>Adults are not to provide any coaching at this point. Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Only direction prompts may be repeated.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask</u> the student to tell what they did. If no response (give plenty of wait time), then model a Think Aloud using the student's mode of communication.</p> <p>Example: "I knew I needed to graph each group of the same thing. I had to count how many in each group. I counted 2 envelopes so I colored two boxes above the envelope label. I counted 3 highlighters so I colored 3 boxes above the highlighter label."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Put, here, on, look, same, different, do</i></p>	

<p>Student should tell how they decided (thinking process) on their answer.</p> <p>Example: “First I had to put things that were the same in one group. Then I made another group of things that were the same. Envelopes and highlighters are different shapes so they had to go into different groups. Then I had to make my graph show how many were in the different groups. Graphs are pictures that show how many of each group. I can use a graph to classify and compare things.”</p>		
<p><i>Get feedback</i></p> <p>Provide feedback. If there was no answer, then model using a Think Aloud.</p> <p>Example: “To make a graph we need to know how many of each thing we have. We put the things in groups that have the same attributes like shape or color. We label our graph for each group. Then we count how many are in each group and record that on our graph.”</p> <p>Bring attention to the thinking process more than the correctness of the answer in the beginning. Try to look for connections demonstrating that the student understands the concept.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Put</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student’s thinking process went, expanding on their description of the process. Model the correct language.</p> <p>Example: “I see you looked at the envelopes and highlighters. You saw that the envelopes were rectangles and the highlighters were cylinders so you made two different groups. You put all of the envelopes in one group because they had the same shape. You put all of the highlighters in a different group because</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, look, same, different, put</i></p>	

they all had the same shape. You knew you had to count each group so you could color in the correct number of boxes for each group."		
<p>Formative Assessment (option)</p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Compare Objects for Sameness



Purposes

The students will have opportunities to notice how 2 items are the same.

- **M.EE.S-CP.1-5** Identify when events are independent or dependent.
- **M.EE.S-IC.1-2** Determine the likelihood of an event occurring when the outcomes are equally likely to occur.

Materials

- Ideas for materials to use can be found here:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: 2 metal spoons varying in size, 2 bent paper clips varying in size
- CORE vocabulary board and/or AAC device for each student
- Copy of the Formative Assessment for the student

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>For each item, allow the student to look at, touch, and manipulate the items while the adult describes the item (attempt to elicit descriptors from the student) and its uses.</p> <p>For example: "These are spoons. They are both used to eat, but they are different in size."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Same, different</p>	<p>This step is very important to allow the student to explore items that might be novel. This will help the student be focused during the instruction.</p> <p>It also allows the teacher to work on joint attention for students who are still struggling in this area. Use movement, light, sound, intonation of voice to gain attention.</p>

		Opportunities for language development and practice with finding words in their AAC device beyond the Core vocabulary are also provided during this time.
<i>Establish a purpose</i> "Today we will compare two items and look for how they might be the same."	Model using student's form of communication. For example: AAC, Braille, signing. <i>Look, same</i>	
<i>Teach and model the concept</i> Present the two paper clips. "Here are two paper clips. They are different sizes, but I can look closer and see how they are the same. Both paper clips are silver. Their color is the same. Both paper clips can hold papers together (demonstrate if possible). Both paper clips are bent."	Model using student's form of communication. For example: AAC, Braille, signing. <i>Look, same, different</i>	For vision impaired students, ensure they have an opportunity to feel each of the paper clips and hear the descriptions while they are holding them.
THINK AND DO		
<i>Students think about what to do:</i> Present the 2 metal spoons to the student. <u>Say:</u> "Compare these spoons. Tell me how they are the same."	Model using student's form of communication. For example: AAC, Braille, signing. <i>Same, look</i>	
<i>Students do:</i> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer 		Allow wait time for processing based on your knowledge of the student's needs. There should be no adult coaching at this time, other than prompts to respond or

<p>The student should attempt to describe how the spoons are the same.</p> <p>If there is no response, refer to the suggestions in the notes to the right, then move on to the Apply section.</p>		<p>to work on joint attention (see below).</p> <p>If the student does not respond, use this as an opportunity to work on joint attention through the use of light, movement, touch and sound to bring the student's attention to the object.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How did you know what was the same?"</p> <p>We are looking for the actions they went through to get the answer. Example: "I looked at it." or "I felt it."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, same</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p><i>Get feedback</i></p> <p>Compare the student's comments to the items. "Yes, both are the same because we eat with them. They are both silver. They both are round at the end with a straight handle."</p> <p>Call attention to the accuracy of the student's comments by comparing to the actual item.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, same, do, here, it</i></p>	<p>This is another opportunity to work on joint attention through the use of light, sound, movement, and touch.</p>
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do. Example: "I saw you look at the spoons and then touch them. I think you were looking for things that might be the same in their color, shape, size and texture or how they feel."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, same, do, here, it</i></p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p>		

- ☐ Attended/response incorrect
- ☐ Attended/response partially correct
- ☐ Attended/response fully correct

Contrast Objects



Purposes

Students will have opportunities to notice how 2 objects are different.

- **M.EE.S-CP.1-5** Identify when events are independent or dependent.
- **M.EE.S-IC.1-2** Determine the likelihood of an event occurring when the outcomes are equally likely to occur.

Materials

- Ideas for materials to use can be found here:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson - 2 metal spoons varying in size, 2 bent paper clips varying in size
- CORE vocabulary board and/or AAC device for each student
- Copy of the Formative Assessment for the student

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>For each item, allow the student to look at, touch, and manipulate the items while the adult describes the item (attempt to elicit descriptors from the student) and its uses.</p> <p>For example: “These are spoons. They are both used to eat, but they are different in size.”</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Same, different</p>	<p>This step is very important to allow the student to explore items that might be novel. This will help the student be focused during the instruction.</p> <p>It also allows the teacher to work on joint attention for students who are still struggling in this area. Use movement, light, sound, intonation of voice to gain attention.</p>

		Opportunities for language development and practice with finding words in their AAC device beyond the Core vocabulary are also provided during this time.
<i>Establish a purpose</i> "Today we will compare two items and look for how they might be different."	Model using student's form of communication. For example: AAC, Braille, signing. <i>Look, different</i>	
<i>Teach and model the concept</i> Present the two paper clips. "Here are two paper clips. They are both silver and can be used to hold papers together" (demonstrate if possible). If I look closer I can see that they are also different. One is bigger than the other (demonstrate). One is smaller than the other (demonstrate)." 	Model using student's form of communication. For example: AAC, Braille, signing. <i>Different, look</i>	For vision impaired students, ensure they have an opportunity to feel each of the paper clips and hear the descriptions while they are holding them.
THINK AND DO		
<i>Students think about what to do:</i> Present the 2 metal spoons to the student. <u>Say:</u> "Compare these spoons. Tell me how they are the different."	Model using student's form of communication. For example: AAC, Braille, signing. <i>Look, different</i>	
<i>Students do:</i> <ul style="list-style-type: none"> ● Solve the problem ● Build the model ● Find the matching shapes ● Put them in order ● Interpret the data, etc. ● Describe/share answer 		Allow wait time for processing based on your knowledge of the student's needs. There should be no adult coaching at this time, other than prompts to respond or

<p>The student should attempt to describe how the spoons are different.</p> <p>If there is no response, refer to the suggestions in the notes to the right, then move on to the Apply section.</p>		<p>to work on joint attention (see below).</p> <p>If the student does not respond, use this as an opportunity to work on joint attention through the use of light, movement, touch and sound to bring the student's attention to the object.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p>Ask: "How did you know what was different?"</p> <p>We are looking for the actions they went through to get the answer. Example: "I looked at it." or "It felt different."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, different</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p><i>Get feedback</i></p> <p>Compare the student's comments to the items. "Yes, the spoons are different sizes. That is how they are different."</p> <p>Call attention to the accuracy of the student's comments by comparing to the actual item.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, different, do, here, it</i></p>	<p>This is another opportunity to work on joint attention through the use of light, sound, movement, and touch.</p>
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do. Example: "I saw you look at the spoons and then touch them. I think you were looking for things that might be different in their color, shape, size, and texture or how they feel."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, different, do, here, it</i></p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Purposes

The students will be grouping 2 or more items based on an attribute and then participating in the creation of a bar graph or line plot.

This is lesson 1 of 2 related lessons.

- Lesson 2 is available here:
 - **IP: HS Classify objects**
https://docs.google.com/document/d/1nvSZAjn7hZ0lUvYm2km3z8x_lzoRzauNiXnr0xdN25Q/edit
- **M.EE.S-ID.1-2** Given data, construct a simple graph (table, line, pie, bar, or picture) and interpret data.
- **M.EE.S-ID.3** Interpret general trends on a graph or chart
- **M.EE.A-REI.10-12** Interpret the meaning of a point on the graph of a line. For example, on a graph of pizza purchases, trace the graph to a point and tell the number of pizzas purchased and the total cost of the pizzas
- **M.EE.F-BF.1** Select the appropriate graphical representation (first quadrant) given a situation involving constant rate of change.
- **M.EE.F-IF.1-3** Use the concept of function to solve problems.
- **M.EE.F-IF.4-6** Construct graphs that represent linear functions with different rates of change and interpret which is faster/slower, higher/lower, etc.
- **M.EE.F-LE.1-3** Model a simple linear function such as $y=mx$ to show that these functions increase by equal amounts over equal intervals.

Materials

- Items that can be grouped together based on attributes. Refer to the collections list for the appropriate grade level found here:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: (HS List) 2 identical napkins, 2 plastic spoons, 3 gloves, 3 dominoes
- **Blank bar graph.** If you need a template, find one here:
<https://www.timvandevall.com/templates/blank-bar-graph-template/>
- CORE vocabulary board and/or AAC device for each student
- Copy of the Formative Assessment for the student

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>For each item, allow the student to look at, touch, and manipulate the items while the adult describes the item (attempt to elicit descriptors from the student) and its uses.</p> <p>For example: “This is a napkin. We use it to wipe our face and hands. It is a square and it is white.” Repeat for each item.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p>Look, on, here, same, different, turn, that</p>	<p>This step is very important to allow the student to explore items that might be novel. This will help the student be focused during the instruction.</p> <p>It also allows the teacher to work on joint attention for students who are still struggling in this area. Use movement, light, sound, intonation of voice to gain attention.</p> <p>Opportunities for language development and practice with finding words in their AAC device beyond the Core vocabulary are also provided during this time.</p>
<p>Establish a purpose</p> <p>“Today we will organize these things based on their attributes, then make a graph to show how we classified them.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p>Same, different, look, on</p>	
<p>Teach and model the concept</p> <ul style="list-style-type: none"> Remove all items except for 3 dominoes and 2 napkins. Place the items in a group. 	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p>	<p>For students who are visually impaired, provide a tactile version of the graph. For example, put the</p>

<ul style="list-style-type: none"> Model a Think Aloud as you group them based on an attribute. "I see that all these (dominoes) are black and white and these are just white (napkins). I can put all of the dominoes in one group and all of the napkins in another group because they are different. I have organized my things into groups." Model making a bar graph by labeling the side with the item names, then counting the items in each group. "There are 1-2-3 dominoes. I will color in one block for each domino to show how many domino I have. There are 1-2 napkins. I will color in one block for each napkin that I have. I have organized and classified my things. I made the bar graph so I can show others how many I have and I can compare the groups." Repeat once or twice more with other items. 	<p><i>Look, same, here, on, it</i></p>	<p>actual dominoes and napkins on the graph. This may require a larger version of the graph.</p>
THINK AND DO		
<p><i>Students think about what to do:</i></p> <ul style="list-style-type: none"> Place 2 spoons and 3 gloves in front of the student. Make sure the items are not already grouped. Direct the student to look at the items and put them in a group based on an attribute they choose. "Here are some spoons and gloves. Organize them in two different groups." 	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Some, put</i></p>	<p>You may offer a template (two circles or squares) that gives them a specific area in which to place each set of items.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> Solve the problem Build the model Find the matching shapes Put them in order Interpret the data, etc. Describe/share answer <ul style="list-style-type: none"> Allow the student to group the items according to his/her choice. 		<p>Allow processing time. Student may use pointing, eye gaze, touching, peer assisted scanning, etc.</p> <p>Adults are not to provide any coaching at this point.</p> <p>Adults should observe the student's</p>

<ul style="list-style-type: none"> • If there is no response from the student after additional prompts to begin, move on to the Apply portion of the lesson and use Think Aloud/modeling. 		<p>responses and make notes (refer to FA below).</p> <p>Only direction prompts may be repeated.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask</u> the student to tell what they did. If no response (give plenty of wait time), then model a Think Aloud using the student's mode of communication.</p> <p>Example: "I see you looked at all of the items and found the ones that looked alike. You put all of the spoons in one group because they were white. You put all of the gloves in another group because they were all red."</p> <p>Student should tell how they decided (thinking process) on their answer.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Same, different, put, look</i></p>	<p>These Think Alouds will reference the description of the thinking process - the how vs the what was done.</p>
<p><i>Get feedback</i></p> <p>Provide feedback. If there was no answer, then model using a Think Aloud. Example: "First I looked at the spoons and gloves. I saw these (indicate the spoons) were all white, and I use them to eat. They were different from the gloves. I put all of those in one group because they all looked the same. Then I saw the gloves (indicate the gloves) which are soft and red, and we use them to keep our hands warm. They are different from the white hard spoons. I put them in a separate group."</p> <p>Bring attention to the thinking process more than the correctness of the answer in the beginning. Try to look for connections demonstrating that the student understands the concept.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Same, different, put, look</i></p>	

<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student's thinking process went, expanding on their description of the process. Model the correct language. Example:</p> <p><i>"You looked at the items and saw how some were the same and some were different. The spoons were white and hard and the gloves were red and soft. You also said the spoons were used for eating and the gloves were used for keeping your hands warm. You put all of the spoons together because they had the same shape and use. You put all of the gloves together because they all had the same shape and use."</i></p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Different, here, same, it, you</i></p>	
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Recognize Attribute Values



Purposes

Students will be able to state the attributes (color, size, texture) of items such as squares, triangles, circles, rectangles, cylinders, ellipses, rhombuses, parallel lines, perpendicular lines, line segments, and angles.

- **M.EE.G.CO.1** Know the attributes of perpendicular lines, parallel lines, and line segments, angles, and circles
- **M.EE.G-GPE.7** Find perimeter and area of squares and rectangles to solve real-world problems.
- **M.EE.S-ID.4** Calculate the mean of a given data set (limit the number of data points to fewer than five).

Materials

- Here is a link to information helpful for designing other learning opportunities for developing shapes knowledge. You will need to set up a free account.
https://learningtrajectories.org/index.php/learning_trajectories/get_trajectory_details/15
- Resource for items to use during this instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: large red circle, small blue square, large triangle with texture (Ideas: add glue spots or attach small pom poms)

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>For each item, allow the student to look at, touch, and manipulate the items while the adult describes the item (attempt to elicit descriptors from the student) and its uses.</p> <p>For example: “These are different shapes. We can use shapes to make things like pictures or buildings.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p>Look, on, here, same, different, turn, that</p>	<p>This step is very important to allow the student to explore items that might be novel. This will help the student be focused during the instruction.</p> <p>It also allows the teacher to work on</p>

<p>A similar alternate anchor activity is the Feely Bag routine: https://www.google.com/url?q=https://www.youtube.com/watch?v%3DJoD4TFxA8gY%26t%3D2s&sa=D&ust=1595425313649000&usg=AFQjCNFQ9p_voOFRf_P74yB7dm4z-0FjhQ</p>		<p>joint attention for students who are still struggling in this area. Use movement, light, sound, intonation of voice to gain attention.</p> <p>Opportunities for language development and practice with finding words in their AAC device beyond the Core vocabulary are also provided during this time.</p>
<p><i>Establish a purpose</i></p> <p>“Today we will recognize shapes by their attribute values.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, on</i></p>	
<p><i>Teach and model the concept</i></p> <p>“We can recognize shapes by how they look and feel. Some shapes have sides and others don’t. We can choose a shape based on its color or how it feels when we touch it. Some shapes are big and some shapes are small.”</p> <p>Place the circle and the square on the table. Complete the Think Aloud below.</p> <p>“I am looking at a shape that has no sides. It is round and red. Looking at my choices, I think about what ‘no sides’ means. Sides are straight and usually smooth. Round means it is curved. I am thinking of other things that can be red, like apples, so that I remember what red looks like. (Point to the circle.) This shape has curved sides and is red. That is the shape I am thinking of.”</p> <p>Repeat the process with the square.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, on</i></p>	<p>For students who are visually impaired, allow them to feel the shape while you describe it.</p>

THINK AND DO

Students think about what to do:

Place the square and the triangle in front of the student.

Say: **"I see a shape that has 4 sides and is blue. Point to the shape I described."**

Model using student's form of communication. For example: AAC, Braille, signing.

You, do, look, it

Provide appropriate wait time based on your knowledge of the student's needs.

If the student does not make a choice, use this as an opportunity to work on joint attention and choice making. Use light, sound, and movement to gain attention to the choices. Repeat the direction to make a choice. At the first indication of making a movement or sound, connect that to the choice you believe the student was indicating. In other words, attribute meaning to their vocalization or movement.

Students do:

- Solve the problem
- Build the model
- Find the matching shapes
- Put them in order
- Interpret the data, etc.
- Describe/share answer

The student should select the small blue square.

There should be no adult coaching at this time. Just provide wait time and prompts as necessary to focus the student on the task.

APPLY

Students describe what was done.

Ask: **"Why did you point to the square?"**

Model using student's form of communication. For example: AAC, Braille, signing.

If the student does not provide a response, then use this as an opportunity to develop joint attention

<p>If no response (give plenty of wait time), then model a Think Aloud (see below for example) using the student's mode of communication.</p>	<p>Why, it</p>	<p>through the use of light, movement, touch, and sound to encourage the student to attend to the objects.</p>
<p>Get feedback</p> <p>Compare the student's response to the item and reasonableness of the answer.</p> <p>Example Think Aloud: "Yes, that is the square. It has 4 sides (count each side while saying it aloud). It is also the color blue."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>It, look</p>	
<p>Make explicit what the students were thinking and doing</p> <p>Explain how the student's thinking process went, expanding on their description of the process. Model the correct language.</p> <p>Example: "You looked at both shapes to find the attributes that were the same as the ones given. You counted the sides and matched the color."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, look, it, same</p>	
<p>Formative Assessment (option)</p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Recognize "Different"

Purposes

To increase the student's ability to recognize items that are different and apply this understanding to geometry concepts. This lesson can also be adapted/modified to focus on attending and noticing what is new.

- **M.EE.G.CO.1** Know the attributes of perpendicular lines, parallel lines, and line segments, angles, and circles
- **M.EE.G-CO.4-5** Given a geometric figure and a rotation, reflection, or translation of that figure, identify the components of the two figures that are congruent.
- **M.EE.G-CO.6-8** Identify corresponding congruent and similar parts of shapes.
- **M.EE.G-MG.1-3** Use properties of geometric shapes to describe real-life objects

Materials

- Select a variety of geometric shapes (include multiple shapes that are the same) to work with. The link provided has lists of items that will be used in the testlets. It is recommended that you include these items in your instruction.
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- CORE vocabulary board and/or AAC device for each student
- Copy of the Formative Assessment for the student
- For this example lesson: 2 sets of perpendicular lines, 2 set of parallel lines, 2 cubes, 2 cylinders (each item in a pair should be identical)

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Allow students to interact with the geometric shapes/representations you have chosen.</p> <p>As the student is interacting with the items, use attribute values to describe them in multiple ways.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Look, it, same, different</p>	<p>This is an opportunity to work on joint attention with the students who are still struggling with attending. Experiment with light, sound, touch, and movement to gain attention to the items. Be creative</p>

		in presenting the items.
<p>Establish a purpose</p> <p>Say: "Today we will practice finding things that are different."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Different</p>	
<p>Teach and model the concept</p> <p>Place two different shapes in front of the student. For example, say: "These are parallel lines. They run next to each other and will never touch. These are perpendicular lines. They cross each other and touch at one point. Parallel lines and perpendicular lines are different."</p> <p>Repeat the process with the other shapes. Presenting two or more shapes that are different. Describe them by noting their attributes such as number of sides, size, and color.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Different</p>	
THINK AND DO		
<p>Students think about what to do:</p> <p>Present the student with 3 items, 2 of which are the same.</p> <p>Point to the group and say: "Which one is different?"</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Different</p>	
<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>Student should indicate an answer.</p>		<p>Allow processing time.</p> <p>Student may use pointing, eye gaze, touching, peer assisted scanning, etc.</p> <p>Adults are not to provide any coaching at this point.</p>

		<p>Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Only direction prompts may be repeated.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How did you know it was different?"</p> <p>Student should tell how they decided (thinking process) on their answer.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>How, different, look, It, same, not</i></p>	<p>Allow for appropriate wait time. If no response, this is an opportunity to work on joint attention and gaining a response.</p> <p>Experiment with light, sound, touch, and movement to gain attention to the items. Be creative in presenting the items.</p>
<p><i>Get feedback</i></p> <p>Provide feedback. Compare the student's answer to the correct answer.</p> <p>For example: "These two are rounded on the edges, while this one is straight or sharp. These two are the same. This one with the straight or sharp edge is different."</p> <p>Bring attention to the thinking process more than the correctness of the answer in the beginning. Try to look for connections demonstrating that the student understands the concept.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, it, same, different</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student's thinking process went, expanding on their description of the process. Model the correct language.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	

Example: "You looked at the items and noticed what was the same and what was different."	<i>Same, look, it</i>	
<i>Formative Assessment (option)</i> <input type="checkbox"/> Did not attend/no response <input type="checkbox"/> Attended/no response <input type="checkbox"/> Attended/response incorrect <input type="checkbox"/> Attended/response partially correct <input type="checkbox"/> Attended/response fully correct		

Recognize "Same"



Purposes

To increase the student's ability to recognize items that are the same and apply this understanding to geometry concepts. This lesson can also be adapted/modified to focus on attending and noticing what is new.

- **M.EE.G.CO.1** Know the attributes of perpendicular lines, parallel lines, and line segments, angles, and circles
- **M.EE.G.CO.4-5** Given a geometric figure and a rotation, reflection, or translation of that figure, identify the components of the two figures that are congruent.
- **M.EE.G.CO.6-8** Identify corresponding congruent and similar parts of shapes.
- **M.EE.G-MG.1-3** Use properties of geometric shapes to describe real-life objects

Materials

- Select a variety of geometric shapes (include multiple shapes that are the same) to work with. The link provided has lists of items that will be used in the testlets. It is recommended that you include these items in your instruction.
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson:
 - 2 sets of perpendicular lines (**Perpendicular lines cards**)
<https://docs.google.com/document/d/1IDz9qK5bS8VCyzEIPj-Whl-Hhlue8ZQHZoYaeMLkknQ/edit>
 - 2 set of parallel lines (**Parallel lines cards**)
https://docs.google.com/document/d/1AQDkdqecr36SpFZpOCrjvhyn4zmVBC5SjA_ZxasaGbY/edit
 - 2 cubes
 - 2 cylinders (each item in a pair should be identical)
- CORE vocabulary board and/or AAC device for each student
- Copy of the Formative Assessment for the student

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Allow students to interact with the geometric shapes you have chosen.</p> <p>As the student is interacting with the items, use attribute values to describe them in multiple ways.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Look, it, same, different</p>	<p>This is an opportunity to work on joint attention with the students who are still struggling with attending. Experiment with light, sound, touch, and movement to gain attention to the items. Be creative in presenting the items.</p>
<p>Establish a purpose</p> <p>Say: "Today we will practice finding things that are the same."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Same</p>	
<p>Teach and model the concept</p> <p>Place two identical perpendicular lines in front of the student. Say: "These are two sets of perpendicular lines. They are the same. They both have two lines that cross each other. They touch right here" (point to the origin) They are the same."</p> <p>Repeat the process with the other shapes. Presenting two or more shapes that are the same. Describe them by noting their attributes such as number of sides, size, and color.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Same, here</p>	
THINK AND DO		
<p>Students think about what to do:</p> <p>Present the student with 3 items, 2 of which are the same.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	

Point to one of the 2 that are the same and ask the student: "Show me the one that is the same."	Same	
<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>Student should indicate an answer.</p>		<p>Allow processing time.</p> <p>Student may use pointing, eye gaze, touching, peer assisted scanning, etc. Adults are not to provide any coaching at this point.</p> <p>Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Only direction prompts may be repeated.</p>
APPLY		
<p>Students describe what was done.</p> <p><u>Ask:</u> "How did you know it was the same?"</p> <p>Student should tell how they decided (thinking process) on their answer.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>How, same, it</p>	
<p>Get feedback</p> <p>Provide feedback. Compare the student's answer to the correct answer.</p> <p>Example: "This one has curved sides and this one has straight sides. The first one also has straight sides. These two are the same."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Same, it</p>	

<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student's thinking process went, expanding on their description of the process. Model the correct language.</p> <p>Example: "I looked at the sides and saw these had curved sides and this one didn't. These two are the same."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, it, do, same</i></p>	
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Distal Precursor

Purposes

Students will begin to develop proportional understanding to work toward describing events as independent or dependent (i.e., probability). Students will be able to classify (i.e., group) items based on their size (e.g., compare two or more items and determine which is larger or smaller), amount (e.g., numbers larger or smaller than a given number), and distance between numbers (e.g., skip counting by 2, 5, or 10).

- **M.EE.S-CP.1-5** Identify when events are independent or dependent.
- **M.EE.S-ID.4** Calculate the mean of a given data set (limit the number of data points to fewer than five).

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of materials that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: 3D shapes of both large and small sizes (cone, cube, pyramid, cylinder, rectangular prism, sphere)
- <https://tarheelreader.org/2010/04/14/shapes-in-3d-3/>
- <https://tarheelreader.org/2010/04/14/shapes-in-3d/>

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Shared reading activity using one of the Tar Heel reader books listed above.</p> <p>This is an opportunity to review the different 3D shapes. Go on a 3D shape hunt in the classroom. Who can find the most cylinders? Cubes?</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, look, same, different</p>	<p>For students with vision impairments, allow them to feel different items and decide if it is 3D or 2D.</p> <p>Students with physical limitations may use eye gaze or peer assisted scanning to find items.</p>

<p><i>Establish a purpose</i></p> <p>“Today we will learn to classify objects using a T-chart.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Put, here, same, different, look</i></p>	<p>Exchange T-chart for Venn diagram or number line based on the task’s requirements. Student should learn to use all three strategies to classify.</p>
<p><i>Teach and model the concept</i></p> <p>Place the 3D shapes in front of the students and allow them to interact with the materials. Review the names of the shapes as they are interacting with them.</p> <p>Place the T-chart in front of the students. Say: “Here is a T-chart. We can use it to group or classify our shapes. Today we will group our shapes by size. Some of the shapes are small and some of the shapes are large. The chart is labeled at the top <u>small</u> on this side and <u>large</u> on this side. Watch. I will find both of my spheres. One is small and one is larger. I will put the smaller one in the small column and the larger one in the large column.” Repeat this with all of the shapes following a similar script (See notes for vocabulary to use as you add shapes).</p> <p>Another option is to <u>not</u> provide the rule, but to begin the groups and model how you decide to use the attributes of the given objects to decide if a shape/object belongs in that group. (See notes for vocabulary to use as you add shapes).</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Some, all, here, same, different, more, not, you, look, I, put</i></p>	<p>Educators should also take care to use words like will, won’t, might, likely, unlikely (e.g., “these will go in the same group”, “these won’t go in the same group”) when working with sets. While students do not need to say these words, they do need to learn the meanings.</p> <p>You could also sort them by other attributes. For example sort them by those that have edges and those that don’t. If your shapes are different colors, you could sort by color.</p> <p>In future lessons, use different items. For example, healthy foods vs unhealthy foods or fiction vs non-fiction books.</p>
<p>THINK AND DO</p>		
<p><i>Students think about what to do:</i></p> <p>Place 4-6 items (several that are small and several that are larger) in front of the student along with a T-chart that is labeled <u>small</u> and <u>large</u>.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p>	<p>Provide a tactile T-chart or boxes for students that have vision impairments.</p>

<p><u>Say:</u> “Put these into groups based on their size. This column is for small items and this column is for large items.”</p> <p><i>(Another option is to not provide the rule and put 1-2 items in a group and have the student finish the grouping as mentioned in the teaching phase above.)</i></p>	<p><i>Put, here, it, more, not, same, different</i></p>	
<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should sort the items into one of the two columns.</p>		<p>Allow wait time for processing based on your knowledge of the student’s needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>The student may use eye gaze and/or verbal/AAC to direct an adult.</p> <p>Use this time to observe and record notes about the student’s responses.</p>
APPLY		
<p>Students describe what was done.</p> <p>Ask: “How did you know?”</p> <p>We are looking for the actions they went through to get the answer. Example: “It more.” “It not more.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p>Why</p>	<p>Allow wait time based on your knowledge of the student’s needs.</p>
<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: “Great job sorting! All of the small items are together. All of the large items are together.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p>	

<p>If the student is not correct, re-teach/model, following the teaching script above.</p>	<p><i>Same, different, here, it, more, not</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: “You looked at the size of each item and compared it to other items. Then you decided if it was larger or smaller. All of these are the small items. All of these are the larger items. Great job classifying!”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Same, different, here, it, more, not, you</i></p>	<p>Expand on the student’s language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Explain Coordinate Pairs (Ordered Pairs)



Purposes

Students will be able to identify pattern rules and make a matching set (pattern) using objects, symbols and numbers. Students will begin to use their counting skills to figure out where to mark a point by counting how far along and how far up the x- and y-axes. Students will be able to identify the x-coordinate in an ordered pair and identify where on the x-axis that coordinate will be placed. Students will be able to identify the y-coordinate in an ordered pair and identify where on the y-axis that coordinate will be placed.

- **M.EE.A-REI.10-12** Interpret the meaning of a point on the graph of a line. For example, on a graph of pizza purchases, trace the graph to a point and tell the number of pizzas purchased and the total cost of the pizzas
- **M.EE.F-BF.1** Select the appropriate graphical representation (first quadrant) given a situation involving constant rate of change.
- **M.EE.F-IF.1-3** Use the concept of function to solve problems.
- **M.EE.F-IF.4-6** Construct graphs that represent linear functions with different rates of change and interpret which is faster/slower, higher/lower, etc.
- **M.EE.F-LE.1-3** Model a simple linear function such as $y=mx$ to show that these functions increase by equal amounts over equal intervals.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
 - For this example lesson:
 - Pattern blocks (concrete or virtual)
 - **Pattern Shapes by the Math Learning Center**
<https://apps.mathlearningcenter.org/pattern-shapes/>
 - **Coordinate grids yx -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 10 9 8 7 6 5 4 3 2**
https://www.eduplace.com/math/mthexp/g5/visual/pdf/vs_g5_37.pdf
 - **Graphing Worksheets | Single Quadrant Ordered Pairs Worksheets**
https://www.math-aids.com/Graphing/Single_Quadrant_Ordered_Pairs.html
 - **Graphing Worksheets | Single Quadrant Graphing Characters Worksheets**
https://www.math-aids.com/Graphing/Single_Quadrant_Graphing_Characters.html

- Small objects that can be placed on the grids (M&M's, skittles, buttons, googly eyes, etc.)
- **Coordinates TChart**
https://docs.google.com/document/d/1e_YdvefjnmomlivpiAgMiqhOGwieJa7hgevsqg_jNmU/edit
- **Tips to Create Large Print and Tactile Graphs for Students with Visual Impairments**
<https://www.pathstoliteracy.org/blog/creating-large-print-and-tactile-graphs>

(***Note:** It is helpful if the student already has some familiarity with copying patterns and making pairs. **IP: 6-8 Arrange Objects in pairs** may be a helpful lesson to start with. Students should also have some familiarity with line graphs and their structure: **DP: 6-8 Recognize structure of a line plot (dot plot).**)

- <https://docs.google.com/document/d/1IFCeBgqq24xagtjdVc49-3QLo1DjDql3toH4S7y3LfE/edit>
- https://docs.google.com/document/d/129F_uovvq_S6FkOTqEfSPeSqCUVh20ff3Og4hhUyL5E/edit

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Make patterns with the pattern blocks for the students to match.</p> <p>For example, lay out the following pattern in a vertical orientation. You may wish to use the Coordinates TChart</p> <p>Green triangle, purple triangle, orange square, green triangle, purple triangle, orange square. The student will then put the matching shape next to it and move down the line.</p> <p>Use the terminology of <i>pairs</i>.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Look, here, it, go, same, different</p>	<p>For students with vision impairments, ensure that your pattern does not rely on color. For example, right triangle, square, hexagon, etc.</p>
<p>Establish a purpose</p> <p>"Today we will learn about coordinate pairs."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	

<p>Teach and model the concept</p> <p>Show a line graph to the students. Review the parts of the line graph including the title, labels, the x-axis and the y-axis.</p> <p>For example: “Here is a line graph. This is the title or what it is showing us. This line across the bottom is the x-axis. The numbers tell us how many. The line that goes up here is the y-axis. It also has numbers and tells us how many in this direction. We use coordinate pairs to know where to put our dots. Coordinate pairs are two different numbers.”</p> <p>Model finding a point. Touch the point with a finger on one hand. “Here is a point. I can label it with a number from the x-axis.” (Model counting over to the right. Write the number on the Coordinates TChart.) “I can label it with a number from y-axis.” (Model counting up the side. Write the number on the Coordinates TChart.)</p> <p>Model with several more points.</p> <p>Use one of the picture graphing activities to model placing points on the coordinate grid.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p>	<p>For students with vision impairments, provide a tactile version of the coordinate grid. Glue and glitter or sand is an easy option to provide raised lines. Also see Tips to Create Large Print and Tactile Graphs for Students with Visual Impairments.</p> <p>Consider using a large scale version on the floor to allow students to physically move around the grid and find/place the points</p>
THINK AND DO		
<p>Students think about what to do:</p> <p>Place a blank coordinate grid in front of the student.</p> <p>Give the student a coordinate pair.</p> <p>Say: “Put a dot (or whatever marker the student is using) on the grid using this coordinate pair.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p>Put, it, here, look</p>	<p>In the beginning, use small numbers as coordinate pairs. Only use the largest number to which the student can count independently. This may mean the grid only goes to 5 on both axes. As the student begins to count higher, you may enlarge the grid to include those numbers.</p>

		Consider using a large scale version on the floor to allow students to physically move around the grid and find/place the points.
<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should place the marker on the coordinate grid using the given coordinates and counting.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe and record notes about the student's responses.</p> <p>*Students with physical limitations may use eye gaze, pointing, partner-assisted scanning, or verbal/AAC to direct an adult.</p>
APPLY		
<p>Students describe what was done.</p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "I look." "I go up."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Why</p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes, you went 5 spaces to the right on the x-axis and 3 spaces up on the y-axis."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	

<p>If the student was incorrect, re-teach/model using the teaching script above.</p>	<p><i>You, look, it here, up, not</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: <i>“You looked at the two numbers. You used the first number to go to the right on the x-axis. You used the second number to go up on the y-axis. Great job!”</i></p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, look, here, it, get, make, on</i></p>	<p>Expand on the student’s language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Match Same 2-Dimensional Shape with Different Size/Orientation



Purposes

The student will be able to analyze shapes and recognize when two dimensional shapes are the same when they are in a different orientation or of a different size.

This is lesson two of two lessons.

- Lesson one can be found here:
 - **DP: HS Match same 2D shape with same size, same orientation**
https://docs.google.com/document/d/1v2ztOPEJeud1Bpsxf-jXQDVTQbsUTzuS2au_WFWCD1I/edit
- **M.EE.G-CO.4-5** Given a geometric figure and a rotation, reflection, or translation of that figure, identify the components of the two figures that are congruent.
- **M.EE.G-CO.6-8** Identify corresponding congruent and similar parts of shapes.
- **M.EE.G-MG.1-3** Use properties of geometric shapes to describe real-life objects

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative assessment for each student
- Shapes of different sizes (2 big and 2 small of each shape) - rectangle, square, circle, triangle, rhombus
- Here is more information about spatial visualization and imagery foundational skills:
https://learningtrajectories.org/index.php/learning_trajectories/get_trajectory_detail/s/12

*(*Note: This lesson can also be done with a variety of items such as crackers, silverware, writing utensils, articles of clothing, etc.)*

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Complete the shared reading activity. Link is provided in the notes.</p> <p>Comments should relate to how the cats are different. It could include descriptions of their positions and colors.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Different</p>	<p>https://shared.tarheelreader.org/shared/read/cats-in-all-shapes-and-sizes</p>
<p>Establish a purpose</p> <p><u>Say:</u> "Today we will find two shapes that are the same, but they may have a different size or are in a different position."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	
<p>Teach and model the concept</p> <p>Place three shapes in front of the student. For example, a large square, a small square, a large circle. Allow the student to interact with the shapes. Compare all three shapes noting the differences and similarities. For example: "Here is a large square. It has four sides that are all the same length. Here is a small square. It also has 4 sides that are all the same length. Here is a large circle. It has no sides. It is a different shape."</p> <p>Lay the shapes down in front of the student (squares are in the same orientation). Model selecting the two squares that have the same shape but a different size. For example: "This large square and this small square both have the same shape. They are both squares. The circle is different."</p> <p>Repeat with several more combinations.</p>	<p>Model using Core board or AAC device</p> <p>It, same, look, different, more, not more</p>	<p>This is an opportunity to work on joint attention and engagement through the use of light, sound, touch, and movement.</p> <p>For most students, you may need to work on different size and different orientation in separate sessions.</p> <p>This example lesson only addresses different sizes as written. If you wish to work on orientation, then begin with same size shapes, but orient them differently by tilting them a bit. When comparing, demonstrate how the shapes can be turned</p>

		<p>and laid on top of each other.</p> <p>Once they are understanding, then you can combine the skills.</p>
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place a large and a small shape of one kind with a different shape in front of the student. Allow the student to interact with the shapes while you talk about the attributes of the shapes.</p> <p>Point to one of the two similar shapes. <u>Say:</u> “Point to the shape that is similar to this one.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, same, look</i></p>	<p>Provide ample wait time based on knowledge about the student’s processing needs.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should indicate the shape that has the same name.</p>		<p>Provide wait time appropriate for that student.</p> <p>Adults are not to provide any coaching at this point.</p> <p>Adults should observe the student’s responses and make notes (refer to FA below). If the student has physical limitations, eye gaze, a pushing stick, or verbal/AAC to direct an adult may be used.</p> <p>If there is no response, use this as an opportunity to improve joint attention and engagement through the use of light, sound, touch and movement.</p>

APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How did you decide?"</p> <p>Student may say: "I look." "It same." "It more." "It not more."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, do</i></p>	<p>Adults are not to provide any coaching at this point.</p> <p>Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Only direction prompts may be repeated.</p>
<p><i>Get feedback</i></p> <p>Provide feedback.</p> <p>If the student is correct, acknowledge it and move on to the next step. For example: "Great job! Both of these have 4 sides. They are different sizes, but they are both squares. They are similar."</p> <p>If the student is incorrect, reteach the concept using the script in the teaching section. Pay special attention to noting the attributes that make the shapes similar and dissimilar given the choices.</p> <p>For example: "This shape has 4 sides and this shape has 3 sides. They are the same size, but they have a different number of sides. They are different shapes. Squares have 4 sides. Triangles have 3 sides. Squares and triangles are different shapes."</p>	<p>Use the student's method of communication to share feedback.</p> <p><i>Same, different, look, on, it, here</i></p>	<p>Bring attention to the thinking process more than the correctness of the answer in the beginning. Try to look for connections demonstrating that the student understands the concept.</p>
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student's thinking process went, expanding on their description of the process. Model the correct language.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Same, do, look, it, on</i></p>	

<p>For example: "I say you look at the size of the shapes. I saw you look/feel the sides. You found the two shapes that had the same shape. Great job!"</p>		
<p><i>Formative Assessment (option)</i></p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Match Same 2-Dimensional Shape with Same Size/Orientation



Purposes

The student will be able to analyze shapes and recognize when two dimensional shapes are the same when they are in the same orientation or size.

This is one of 2 lessons.

- The second lesson can be found here:
 - **DP: HS Match same 2D shape with different size/orientation**
<https://docs.google.com/document/d/1puERim7grmG1g03tfqA4dG7P9-C9O0PnrAqLIWpOZ4Y/edit>
- **M.EE.G-MG.1-3** Use properties of geometric shapes to describe real-life objects

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative assessment for each student
- Shapes of different sizes (2 big and 2 small of each shape): rectangle, square, circle, triangle, rhombus
- Here is more information about spatial visualization and imagery foundational skills:
https://learningtrajectories.org/index.php/learning_trajectories/get_trajectory_detail/s/12

(*Note: This lesson can also be done with a variety of items such as crackers, silverware, writing utensils, articles of clothing, etc.)

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
Activate prior knowledge or build new knowledge Complete shared reading activity, noting the pictures that are exactly the same.	Model using student's form of communication. For example: AAC, Braille, signing. Same, different	https://shared.tarheelreader.org/shared/read/same-same

<p><i>Establish a purpose</i></p> <p><u>Say:</u> "Today we will find two shapes that are the same size and are in the same position."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	
<p><i>Teach and model the concept</i></p> <p>Place 2 identical large squares in the same orientation in front of the student. "These squares are the same. They are the same shape and size." Lay them on top of one another to show how they match up. Allow the student to interact with the two shapes to feel how they are the same.</p> <p>Place one of the large squares back on the table and add one small square. While holding up the remaining large square, say: "I will find the matching square. I need to find the one that is the same." Hold the shape next to each of the other shapes and compare the size. For example: "This square is bigger than that square. It is not the same. It is different." Or: "This square is the same size as that square. They can fit right on top of each other. They are the same. This one is the match."</p> <p>Repeat several more times, modeling as above.</p>	<p>Model using Core board or AAC device.</p> <p><i>Same, look, here, different</i></p>	<p>This is also an opportunity to work on joint attention and engagement through the use of light, sound, touch, and movement.</p>
<p>THINK AND DO</p>		
<p><i>Students think about what to do:</i></p> <p>Place two different shapes in front of the student. Allow the student to interact with the shapes. Talk about the attributes of the shapes.</p> <p>Hold up another shape that matches the size and orientation of one of the two shapes.</p> <p><u>Say:</u> "Show me which shape is the same."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>What, same</i></p>	<p>Provide ample wait time based on knowledge of the student's processing needs.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes 	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	<p>Adults are not to provide any coaching at this point.</p>

<ul style="list-style-type: none"> • Put them in order • Interpret the data, etc. • Describe/share answer 		<p>Prompting and repeating of directions as needed.</p> <p>Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Students with physical limitations may use eye gaze, a pushing stick, and/or verbal/AAC to direct an adult.</p> <p>If there is no response from the student, this is an opportunity to work on joint attention and engagement through the use of light, sound touch, and movement.</p>
<p>Student should indicate the matching shape (same size, same orientation)</p>		
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How did you decide?"</p> <p>Student should tell how they decided (thinking process) on their answer.</p> <p>They may respond with: "I look." "It on."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why, you, it</i></p>	<p>Adults are not to provide any coaching at this point.</p> <p>Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Only direction prompts may be repeated.</p>
<p><i>Get feedback</i></p> <p>Provide feedback.</p> <p>If the student is correct then acknowledge the answer and move on to the next step. For</p>	<p>Use the student's method of communication to share feedback.</p>	<p>Bring attention to the thinking process more than the correctness of the answer in the beginning. Try to look</p>

<p>example: “Yes. It matches the size and orientation. Great job!”</p> <p>If the student is incorrect, lay the shapes on top of each other and note how they don’t match. Allow the student to feel the differences. Repeat the above teaching script.</p>	<p><i>Same, it, look</i></p>	<p>for connections demonstrating that the student understands the concept.</p>
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student’s thinking process went, expanding on their description of the process. Model the correct language.</p> <p>For example: “I saw you look and feel the shapes. You chose the one that was the same size. It fit exactly on the other one. It is also in the same orientation. Great job finding the match!”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Same, look, it, on</i></p>	
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Match Same 3-Dimensional Shape with Different Size/Orientation



Purposes

The student will be able to analyze 3D shapes and recognize when three dimensional shapes are the same when they are in a different orientation or of a different size.

This is lesson two of two lessons.

- Lesson one can be found here:
 - **DP: HS Match same 3D shape with same size, same orientation**
https://docs.google.com/document/d/1S1khbltXAlQyS8F-mbEPBYwNVfF_BopMOdj2dmBaty8/edit
- **M.EE.G-MG.1-3** Use properties of geometric shapes to describe real-life objects
- **M.EE.G-CO.4-5** Given a geometric figure and a rotation, reflection, or translation of that figure, identify the components of the two figures that are congruent.
- **M.EE.G-CO.6-8** Identify corresponding congruent and similar parts of shapes.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative assessment for each student
- 3D Shapes of different sizes (2 big and 2 small of each shape): cone, pyramid, cube, rectangular prism, cylinder
- Here is more information about spatial visualization and imagery foundational skills:
https://learningtrajectories.org/index.php/learning_trajectories/get_trajectory_detail/s/12

*(*Note: This lesson can also be done with a variety of items such as crackers, silverware, writing utensils, articles of clothing, etc.)*

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Complete the shared reading activity. Link is provided in the notes.</p> <p>Comments should relate to how the cats are different. It could include descriptions of their positions and colors.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Different</p>	<p>https://shared.tarheelreader.org/shared/read/cats-in-all-shapes-and-sizes</p>
<p>Establish a purpose</p> <p><u>Say:</u> "Today we will find two shapes that are the same, but they may have a different size or are in a different position."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	
<p>Teach and model the concept</p> <p>Place three shapes in front of the student. For example, a large square, a small square, a large circle. Allow the student to interact with the shapes. Compare all three shapes noting the differences and similarities. For example: "Here is a large cube. It has six faces that are all the same size. Here is a small cube. It also has 6 faces that are all the same size. Here is a large cylinder. It has circles on each end. It is a different shape."</p> <p>Lay the shapes down in front of the student (squares are in the same orientation). Model selecting the two squares that have the same shape but a different size. For example: "This large cube and this small cube both have the same shape. They are both cubes. The cylinder is different."</p> <p>Repeat with several more combinations.</p>	<p>Model using Core board or AAC device</p> <p>It, same, look, different, more, not more</p>	<p>This is an opportunity to work on joint attention and engagement through the use of light, sound, touch, and movement.</p> <p>For most students, you may need to work on different size and different orientation in separate sessions.</p> <p>This example lesson only addresses different sizes as written. If you wish to work on orientation, then begin with same size shapes, but orient them differently by tilting them a bit. When comparing, demonstrate how the shapes can be turned</p>

		<p>and laid on top of each other.</p> <p>Once they are understanding, then you can combine the skills.</p>
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place a large and a small shape of one kind with a different shape in front of the student. Allow the student to interact with the shapes while you talk about the attributes of the shapes.</p> <p>Point to one of the two similar shapes. <u>Say:</u> “Point to the shape that is similar to this one.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, same, look</i></p>	<p>Provide ample wait time based on knowledge about the student’s processing needs.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should indicate the shape that has the same name.</p>		<p>Provide wait time appropriate for that student.</p> <p>Adults are not to provide any coaching at this point.</p> <p>Adults should observe the student’s responses and make notes (refer to FA below). If the student has physical limitations, eye gaze, a pushing stick, or verbal/AAC to direct an adult may be used.</p> <p>If there is no response, use this as an opportunity to improve joint attention and engagement through the use of light, sound, touch and movement.</p>

APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How did you decide?"</p> <p>Student may say: "I look." "It same." "It more." "It not more."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, do</i></p>	<p>Adults are not to provide any coaching at this point.</p> <p>Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Only direction prompts may be repeated.</p>
<p><i>Get feedback</i></p> <p>Provide feedback.</p> <p>If the student is correct, acknowledge it and move on to the next step. For example: "Great job! Both of these have 6 faces. They are different sizes, but they are both cubes. They are similar."</p> <p>If the student is incorrect, reteach the concept using the script in the teaching section. Pay special attention to noting the attributes that make the shapes similar and dissimilar given the choices.</p> <p>For example: "This shape has 6 faces and this shape has 2 faces in the shape of a circle. They are the same size, but they have different shapes for their faces. They are different shapes. cubes have 6 sides. Cylinders have 2 faces. Cubes and cylinders are different shapes."</p>	<p>Use the student's method of communication to share feedback.</p> <p><i>Same, different, look, on, it, here</i></p>	<p>Bring attention to the thinking process more than the correctness of the answer in the beginning. Try to look for connections demonstrating that the student understands the concept.</p>
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student's thinking process went, expanding on their description of the process. Model the correct language.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Same, do, look, it, on</i></p>	

For example: "I saw you look at the size of the shapes. I saw you look/feel the sides. You found the two shapes that had the same shape. Great job!"		
<i>Formative Assessment (option)</i> <input type="checkbox"/> Did not attend/no response <input type="checkbox"/> Attended/no response <input type="checkbox"/> Attended/response incorrect <input type="checkbox"/> Attended/response partially correct <input type="checkbox"/> Attended/response fully correct		

Match Same 3-Dimensional Shape with Same Size/Orientation



Purposes

The student will be able to analyze 3-D shapes and recognize when three dimensional shapes are the same when they are in the same orientation or size.

This is one of 2 lessons.

- The second lesson can be found here:
 - **DP: HS Match same 3D shape with different size/orientation**
<https://docs.google.com/document/d/10vq0zDUgCBH5hp7fks1bS87GeiYoWR4yl0bAhjizu9U/edit>
- **M.EE.G-CO.6-8** Identify corresponding congruent and similar parts of shapes.
- **M.EE.G-MG.1-3** Use properties of geometric shapes to describe real-life objects

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative assessment for each student
- 3D Shapes of different sizes (2 big and 2 small of each shape): cone, pyramid, cube, rectangular prism, cylinder
- Here is more information about spatial visualization and imagery foundational skills:
https://learningtrajectories.org/index.php/learning_trajectories/get_trajectory_detail/s/12

(***Note:** This lesson can also be done with a variety of items such as crackers, silverware, writing utensils, articles of clothing, etc.)

Lesson Plan	AAC Suggestions	Notes
Teacher/Student Actions		
ANCHOR		
Activate prior knowledge or build new knowledge Complete shared reading activity, noting the pictures that are exactly the same.	Model using student's form of communication. For example: AAC, Braille, signing.	https://shared.tarheelreader.org/shared/read/same-same

	Same, different	
<p>Establish a purpose</p> <p><u>Say:</u> "Today we will find two shapes that are the same size and are in the same position."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	
<p>Teach and model the concept</p> <p>Place 2 identical large cubes in the same orientation in front of the student. "These cubes are the same. They are the same shape and size." Lay them on top of one another to show how they match up. Allow the student to interact with the two shapes to feel how they are the same.</p> <p>Place one of the large cubes back on the table and add one small cube. While holding up the remaining large cube, say: "I will find the matching cube. I need to find the one that is the same." Hold the shape next to each of the other shapes and compare the size. For example: "This cube is bigger than that cube. It is not the same. It is different." Or: "This cube is the same size as that cube. They can fit right on top of each other. They are the same. This one is the match."</p> <p>Repeat several more times, modeling as above.</p>	<p>Model using Core board or AAC device.</p> <p>Same, look, here, different</p>	<p>This is also an opportunity to work on joint attention and engagement through the use of light, sound, touch, and movement.</p>
THINK AND DO		
<p>Students think about what to do:</p> <p>Place two different shapes in front of the student. Allow the student to interact with the shapes. Talk about the attributes of the shapes.</p> <p>Hold up another shape that matches the size and orientation of one of the two shapes.</p> <p><u>Say:</u> "Show me which shape is the same."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>What, same</p>	<p>Provide ample wait time based on knowledge of the student's processing needs.</p>
<p>Students do:</p> <ul style="list-style-type: none"> Solve the problem 		<p>Adults are not to provide any coaching at this point.</p>

<ul style="list-style-type: none"> • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>Student should indicate the matching shape (same size, same orientation)</p>		<p>Prompting and repeating of directions as needed.</p> <p>Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Students with physical limitations may use eye gaze, a pushing stick, and/or verbal/AAC to direct an adult.</p> <p>If there is no response from the student, this is an opportunity to work on joint attention and engagement through the use of light, sound touch, and movement.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How did you decide?"</p> <p>Student should tell how they decided (thinking process) on their answer. They may respond with: "I look." "It on."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why, you, it</i></p>	<p>Adults are not to provide any coaching at this point.</p> <p>Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Only direction prompts may be repeated.</p>
<p><i>Get feedback</i></p> <p>Provide feedback.</p> <p>If the student is correct then acknowledge the answer and move on to the next step. For</p>	<p>Use the student's method of communication to share feedback.</p>	<p>Bring attention to the thinking process more than the correctness of the answer in the beginning. Try to look</p>

<p>example: "Yes. It matches the size and position. Great job!"</p> <p>If the student is incorrect, lay the shapes on top of each other and note how they don't match. Allow the student to feel the differences. Repeat the above teaching script.</p>	<p><i>Same, it, look</i></p>	<p>for connections demonstrating that the student understands the concept.</p>
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student's thinking process went, expanding on their description of the process. Model the correct language.</p> <p>For example: "I saw you look and feel the shapes. You chose the one that was the same size. It fit exactly on the other one. It is also in the same orientation. Great job finding the match!"</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Same, look, it, on</i></p>	
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Recognize Angle



Purposes

Students will be able to identify an angle based on its attributes.

- **M.EE.G.CO.1** Know the attributes of perpendicular lines, parallel lines, and line segments, angles, and circles

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this lesson: Pictures of angles, lines, rays, points, line segments; items that have angles (books, notebooks, door jam, whiteboards, windows, boxes, etc.)
- **Angle diagram**
<https://docs.google.com/document/d/1kZkKQUhscutF-U2TwoSn9c9W8ChQrMjZWfQL6p-7OsM/edit>
- **Is it an angle?** (cut apart)
<https://docs.google.com/document/d/1M0eEQLf0gWBjnZsONvXnXggMsZ4eWXXhvwRknxmjO0/edit>
- **Angle TChart**
<https://docs.google.com/document/d/1H2HAdyCfccHTYrIhd95kYfLFphj8VAO824wOBF96IM8/edit>

***Note:** Students should already know line, point and ray:

- **DP: HS Recognize Line**
<https://docs.google.com/document/d/1WUKGPK4hSFOC4YBoZj2U6nB7eQyu4YWWCXeT7splwM/edit>
- **DP: HS Recognize Point**
<https://docs.google.com/document/d/1M1mamdn6iY2X4fFy8gfC5EEQSp5vj8Hj4SGjM4ObLFk/edit>
- **DP: HS Recognize Ray**
https://docs.google.com/document/d/1F26oto-20ziEjOWA8J4ogrT19iwXEhIXk_nuNfP_skw/edit

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Go on a class treasure hunt to find lines, line segments, points, and rays. A mix of real objects and 'hidden' pictures can be used.</p> <p>Pencils, door jams, books, zippers, are all examples of items that could be used.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Here, it, stop, on, go</p>	<p>When using pictures, make them tactile with glue and string to allow students with vision impairments to feel them. Students with physical limitations, may have items placed within their reach to explore.</p>
<p>Establish a purpose</p> <p>"Today we will learn about angles."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Look, do</p>	
<p>Teach and model the concept</p> <p><u>Say:</u> "Angles can be found everywhere. When you see a corner. That is an angle." Walk around the classroom and/or show students examples of angles. Also point out items that do not have angles, such as a ball and other round objects.</p> <p>Show the Angle diagram. Use the examples to show each of the kinds of angles. You may also draw them. "Angles can be made of 2 rays that meet at one point. Remember a ray has an endpoint on one side. The other side goes on forever in one direction. Put 2 rays together and we have an angle. An angle can be made of 2 line segments stopping at the same endpoint. An angle can also be made from 2 lines that cross at a single point."</p> <p>Place the Angle TChart and the Is it an angle? pieces on the table. Model with two or three of the pieces through a think aloud.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	<p>Other options for practice include going on a "field trip." Point out or have students find things and decide if it has angles or no angles. During the field trip students and/or adults could take pictures and use them to make a reference book for the classroom.</p> <p>Students with vision impairments will need tactile versions of the diagram. These can be easily made by using glue and string along the lines and then a small round item like a</p>

<p>For example: “This is an angle. It has two rays that meet at one endpoint. I will put it in the Angle column. This is a circle. There are no straight lines or corners. It is not an angle.”</p>		<p>button for the endpoint. All students should have opportunities to feel the shape of the angles.</p> <p>Hand-under-hand could be used for students who require physical support. Provide opportunities for the students to feel you drawing the angles. You may also provide writing utensils and paper/whiteboards so the students can practice mark-making.</p>
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place the Is it an angle? Pieces two at a time in front of the student. One should be an angle and one should not be an angle.</p> <p><u>Say:</u> “Point to the angle.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, it, do, get</i></p>	<p>Other options for Think and Do include going on a “field trip.” Point out items and have the student decide if it has angles or no angles. They could have Yes/No response cards or use their Core board to respond.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should indicate the angle.</p>		<p>Allow wait time for processing based on your knowledge of the student’s needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p>

		<p>Use this time to observe and record notes about the student's responses.</p> <p>The student may use eye gaze or peer-assisted scanning to select their choice.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "On here. Go. Stop (indicating the end point and then the rays going out.)."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes that is an angle."</p> <p>If the student was incorrect, re-teach/model following the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You did it.</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: "You found the picture that had an endpoint with two lines extending out. That is an angle."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>On, here, go, it, look, stop</i></p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Recognize Line



Purposes

Students will be able to identify a line by its attributes (a line has arrows on both ends).

- **M.EE.G.CO.1** Know the attributes of perpendicular lines, parallel lines, and line segments, angles, and circles

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Pictures of lines, other items that have lines in them such as graphs, maps, books.
- **Is it a Line, ray, or point?** (examples of lines, rays, and points)
<https://docs.google.com/document/d/1OeUGp3wmQ31taqxBm7pGHAGlxCOB0GSPvbHfuYp8dg4/edit>
- <https://shared.tarheelreader.org/shared/read/dodge-city-bus-system-2>
- <https://shared.tarheelreader.org/shared/read/gymnasiums>
- **Creatability**
<https://experiments.withgoogle.com/collection/creatability>

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Choose one or both of the listed activities. You may alternate each time you present the lesson.</p> <p><u>Shared Reading</u>: Complete a shared reading activity using one of the listed books or select another that is appropriate for your students. Comments should be related to the lines drawn/shown in the pictures. Have them trace</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Here, it, on, you, look, go</p>	<p>https://shared.tarheelreader.org/shared/read/dodge-city-bus-system-2</p> <p>https://shared.tarheelreader.org/shared/read/gymnasiums</p> <p>Mark-making is an important developmental skill</p>

<p>the lines with their fingers. Take a field trip to the gym to find similar lines. Follow them in the gym.</p> <p><u>Art Time</u>: Provide paper and other drawing materials such as crayons, colored pencils, markers, finger paints, etc. Creatability may provide access to certain students. After allowing some drawing time, point out the use of lines in their drawings. Describe their attributes such as 'thick,' 'thin,' 'wavy,' long,' etc.</p>		<p>that provides a foundation for math and literacy skills.</p> <p>Encourage all students to use a variety of writing utensils to make marks. Work with your OT to modify/adapt the utensils to the needs of your students.</p>
<p><i>Establish a purpose</i></p> <p><i>"Today we will learn to identify lines."</i></p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, look, here</i></p>	
<p><i>Teach and model the concept</i></p> <p>While holding up one of their drawings or a picture (or maybe even when you are in the gym), <u>say</u>: <i>"We use lines every day. We walk in a line. We follow lines to the cafeteria. We draw lines or look at lines to decide what shape is drawn. In math, lines have arrows at each end (Show a picture of a line)."</i></p> <p>Show examples and non-examples. For example:</p> <p>Show a point. <u>Say</u>: <i>"This is one point. There are no arrows. This is not a line. This is a point."</i></p> <p>Show a ray. <u>Say</u>: <i>"This has only one arrow. This is not a line. It is a ray."</i></p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	<p>For students with vision impairments, provide tactile examples. Glue and glitter or sand can be used to raise the figures for the student to feel them.</p> <p>Be cognizant of which figures you have directly taught. If point or ray has not been directly taught do not use that vocabulary in this lesson as it may cause confusion. Instead point out the lack of defining attributes.</p>

THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Present the student with 2-3 choices of geometric shapes/figures with at least one line. (For example: point, line, and ray.)</p> <p><u>Say:</u> "Show me the line."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, look, get</i></p>	<p>For students with vision impairments, provide tactile choices. Glue and glitter or sand can be used to raise the figures for the student to feel them.</p> <p>You may also wish to have the students identify lines in concrete objects such as books, other pictures, graphs, etc.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>Students should indicate the correct choice.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe and record notes about the student's responses.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "It goes, not stop."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>

<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: “Yes, that is a line.”</p> <p>If the student was incorrect, re-teach/model following the teaching script above.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p>You, did, it</p>	
<p>Make explicit what the students were thinking and doing</p> <p>Describe what you saw the student do.</p> <p>Example: “You looked at the choices. You found the one that had arrows at both ends. Great job finding the line!”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p>Same, look, here, it, on, go</p>	<p>Expand on the student’s language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p>Formative Assessment (option)</p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Recognize Measurable Attributes



Purposes

When given shapes, students will be able to recognize the attributes of the shape, such as length, height, and area using words such as big/small, tall/short, wide/narrow.

- **M.EE.G-GPE.7** Find perimeter and area of squares and rectangles to solve real-world problems.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of materials that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: A variety of shapes in different sizes, widths, and areas. You may use a mixture of pattern blocks, paper cut-outs of shapes, pictures, etc.
- **Big/Small Shapes** (a few shapes of different sizes to get you started with identifying big/small)
https://docs.google.com/document/d/1C5lwbuR0PFrX_nI7TTx4w4nQF6eFNf-KojNzJqY86GE/edit

(Please note that students should already be familiar with measurable attributes before presenting this lesson. If they need a review or more instruction refer to **IP: K-5 Attribute Introduction Lesson Routine**)

- https://docs.google.com/document/d/1_crmZ7rkmBMjD4kTj384_g3fBFAMShdOtFFt465QQP8/edit

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
Activate prior knowledge or build new knowledge <u>I Spy</u> : Practice receptive understanding of a variety of attributes by playing "I Spy."	Model using student's form of communication. For example: AAC, Braille, signing. Look, it, go	Depending on the level of students, you may wish to just have them find a small item or keep describing it until they find it.

For example: "I spy with my little eye, something small." Students should then find something small.		For students with physical limitations, you may wish to put several items within their reach that fit the attributes you will be targeting.
<i>Establish a purpose</i> "Today you will learn to describe shapes using attributes that we can measure."	Model using student's form of communication. For example: AAC, Braille, signing. <i>You, look, same, different, more, not</i>	
<i>Teach and model the concept</i> Lay out the shapes that you will be using for the lesson. Allow the students to interact with the materials for a few minutes. You may review the shape names and vocabulary such as sides and angles if these have been introduced. Select a set of shapes (big/small). <u>Say:</u> "Shapes can be big or small. When we look at a shape we can describe it in several ways. For example, I can say this shape is red. It has four sides. The sides are all the same length. I can also describe it using words that tell the size of the shape. Here are two squares. This square is big. (Point to the big square.) This square over here is small. (Point to the small square.) We can tell someone which square we want by telling the size of the square. (Lay out several squares, at least one big square and several smaller squares.) I can say I want the big square. I look at all of the squares and find the one that has more space than the others. This square is big. These other squares are smaller." Repeat the big versus small comparison with several other shapes, using the above script as a guide.	Model using student's form of communication. For example: AAC, Braille, signing. <i>More, not, same, different, here, it</i>	Vision impaired students should have cut out shapes/pattern blocks or textured shapes to feel for comparison. In the first few repetitions of the lesson, only focus on one set of attributes at a time. For example, teach only big versus small then teach only wide versus narrow, and finally teach tall versus short. Once all three have been taught, you may ask for all three to be recognized in one session. This example will focus on big versus small.

THINK AND DO

Students think about what to do:

Lay at least two shapes of different sizes in front of the student (one big and one small).

Point to the larger shape and say: **"Tell me about the shape."**

Point to the smaller shape and say: **"Tell me about the shape."**

Model using student's form of communication. For example: AAC, Braille, signing.

You, look, what, different

In other lessons, substitute the attribute you have taught.

For some students, you may need to have them practice in a more receptive manner such as giving them choices of the words to use rather than the whole Core Vocabulary board or ask them to find the 'big' or 'small' shape through pointing.

The goal is to have them use their form of communication to describe the shape using the target terms.

Students do:

- Solve the problem
- Build the model
- Find the matching shapes
- Put them in order
- Interpret the data, etc.
- Describe/share answer

The students should tell you big (more) or small (not more) as it pertains to the target shape.

Allow wait time for processing based on your knowledge of the student's needs.

There should be no adult coaching at this time, other than prompts to respond or to work.

Use this time to observe and make notes about the student's responses.

The student should use their form of communication or as described above indicate by pointing,

		eye gaze, or peer-assisted scanning in the early stages of learning.
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> “How do you know?”</p> <p>We are looking for the actions they went through to get the answer. Example: “I look.” “It same.” “It different.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student’s needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: “Yes, that shape is big.”</p> <p>If the student is incorrect, then re-teach/model using the teaching script above.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, look, it</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: “You looked at both shapes. You compared them. This one takes up more space. This shape is big.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, look, it, same, different, more, not</i></p>	<p>Expand on the student’s language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Recognize Outcomes of an Event



Purposes

Students will develop proportional understanding while working toward describing events as independent or dependent. Students will be able to classify (i.e., group) items based on their size (e.g., compare two or more items and determine which is larger or smaller), amount (e.g., numbers larger or smaller than a given number), and distance between numbers (e.g., skip counting by 2, 5, or 10).

- **M.EE.S-IC.1-2** Determine the likelihood of an event occurring when the outcomes are equally likely to occur.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of materials that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: 3D shapes of both large and small sizes (cone, cube, pyramid, cylinder, rectangular prism, sphere)
- <https://tarheelreader.org/2010/04/14/shapes-in-3d-3/>
- <https://tarheelreader.org/2010/04/14/shapes-in-3d/>

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Complete a shared reading activity using one of the Tar Heel reader books listed above.</p> <p>This is an opportunity to review the different 3D shapes. Go on a 3D shape hunt in the classroom. Who can find the most cylinders? Cubes?</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, look, same, different</p>	<p>For students with vision impairments, allow them to feel different items and decide if it is 3D or 2D.</p> <p>Students with physical limitations may use eye gaze or peer assisted scanning to find items.</p>

<p><i>Establish a purpose</i></p> <p>“Today we will learn to decide where to place objects using a T-chart and their attributes.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Put, here, same, different, look</i></p>	<p>Exchange T-chart for Venn diagram or number line based on the task’s requirements.</p>
<p><i>Teach and model the concept</i></p> <p>Place the 3D shapes in front of the students and allow them to interact with the materials. Review the names of the shapes as they are interacting with them.</p> <p>Place the T-chart in front of the students. Say: “Here is a T-chart. We can use it to group or classify our shapes. Today we will group our shapes by size. Some of the shapes are small and some of the shapes are large. The chart is labeled at the top <u>small</u> on this side and <u>large</u> on this side. Watch. I will find both of my spheres. One is small and one is larger. I will put the smaller one in the small column and the larger one in the large column.”</p> <p>Repeat this with all of the shapes following a similar script.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Some, all, here, same, different, more, not, you, look, I, put</i></p>	<p>Exchange T-chart for Venn diagram or number line based on the task’s requirements.</p> <p>You could also sort them by other attributes. For example sort them by those that have edges and those that don’t. If your shapes are different colors, you could sort by color.</p> <p>In future lessons, use different items. For example, healthy foods vs unhealthy foods or fiction vs non-fiction books.</p> <p>Educators should also take care to use words like “will”, “won’t”, “might”, “likely”, and “unlikely” when talking about events (e.g., “The traffic lights will change from red to green. The traffic lights won’t change from red to blue.”, “A ball is likely to bounce when it is dropped.”, “It is unlikely I will travel to the moon.”).</p>

THINK AND DO

Students think about what to do:

Place 4-6 items (several that are small and several that are larger) in front of the student along with a T-chart that is labeled small and large.

Say: “Put these into groups based on their size. This column is for small items and this column is for large items.”

Model using student’s form of communication. For example: AAC, Braille, signing.

Put, here, it, more, not, same, different

Provide a tactile T-chart or boxes for students that have vision impairments.

Students do:

- Solve the problem
- Build the model
- Find the matching shapes
- Put them in order
- Interpret the data, etc.
- Describe/share answer

The student should sort the items into one of the two columns.

Allow wait time for processing based on your knowledge of the student’s needs.

There should be no adult coaching at this time, other than prompts to respond or to work.

The student may use eye gaze and/or verbal/AAC to direct an adult.

Use this time to observe and record notes about the student’s responses.

APPLY

Students describe what was done.

Ask: “How did you know?”

We are looking for the actions they went through to get the answer. Example: “It more.” “It not more.”

Model using student’s form of communication. For example: AAC, Braille, signing.

Why

Allow wait time based on your knowledge of the student’s needs.

Get feedback

If the student was correct, acknowledge it and move on to the next step. For example: “Great

Model using student’s form of communication. For

<p>job sorting! All of the small items are together. All of the large items are together."</p> <p>If the student is not correct, re-teach/model, following the teaching script above.</p>	<p>example: AAC, Braille, signing.</p> <p><i>Same, different, here, it, more, not</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: "You looked at the size of each item and compared it to other items. Then you decided if it was larger or smaller. All of these are the small items. All of these are the larger items. Great job classifying!"</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Same, different, here, it, more, not, you</i></p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Recognize Point



Purposes

Students will be able to identify a point based on its attributes (a point is a dot on a line).

NOTE: Recognizing point should only be taught in the context of a lesson on lines, line segments, and angles.

- **M.EE.G.CO.1** Know the attributes of perpendicular lines, parallel lines, and line segments, angles, and circles

Materials

- Copy of Core Vocabulary Board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- **Example graphs:**
https://docs.google.com/document/d/1Fv5HO9-yk_kXR0uRThgif441bLGqH9aMdSZ6uvbpd4Y/edit

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Present a variety of lines to the students. Ask the students to find the starting and ending points of the lines, rays, and line segments.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Here, finished, stop, go, look</p>	<p>The lines can be on paper or on the floor. Make sure the points are highly visible or tactile depending on the needs of the student.</p> <p>If students are unable to identify the beginning and ending points of the lines, consider reteaching the following lesson before moving on. DP:</p>

		<p>K-5 Recognize point https://docs.google.com/document/d/1K2djO2uCRxVuyXzJ-m1PhL-Lks9njQYtLlchTdsdil8/edit</p> <p>Students can use eye gaze, peer-assisted scanning, or verbal/AAC to direct an adult.</p>
<p><i>Establish a purpose</i></p> <p>“Today, we will learn that points are found on graphs.”</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, put, on, here</i></p>	
<p><i>Teach and model the concept</i></p> <p>Lay out several line graphs, for the students to review. Talk about the parts of the graph such as the title and labels.</p> <p><u>Say:</u> “A point is a dot on a graph. Points can represent numbers or amounts. Points also represent positions.”</p> <p>Indicate a point on one of the graphs. “This dot here is a point. This dot up here is also a point.”</p> <p>Indicate non-examples: “The label here is not a point on a graph. The label tells us what the graph is about. The label does not represent numbers.”</p> <p>Show a graph with an angle, shape, or ray. Indicate the points at the vertices of the angle or shapes and the point that begins the ray. Model finding these points while describing the figures.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>On, it, here, look, different, not</i></p>	<p>Students with vision impairments will need tactile graphs. Glue and any small round item can be used to adapt the graph.</p> <p>Use a wide variety of line graphs and coordinate grids with many different shape lines and geometric figures across repetitions of this lesson.</p>

For example: "This point here is the starting point for this ray." Or: "There are points at each of the corners or vertices of this square."		
THINK AND DO		
<i>Students think about what to do:</i> Place a graph (line graph) in front of the student. <u>Say:</u> "Show me a point."	Model using student's form of communication. For example: AAC, Braille, signing. <i>Look, get, here</i>	Students with vision impairments will need tactile graphs. Glue and any small round item can be used to adapt the graph.
<i>Students do:</i> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer The student should indicate one of the points on the graph.		Allow wait time for processing based on your knowledge of the student's needs. There should be no adult coaching at this time, other than prompts to respond or to work. Use this time to observe and record notes about the student's responses. The student may use eye gaze, peer-assisted scanning, or verbal/AAC to direct an adult.
APPLY		
<i>Students describe what was done.</i> <u>Ask:</u> "How do you know?" We are looking for the actions they went through to get the answer. Example: "It here." "I look." "On here."	Model using student's form of communication. For example: AAC, Braille, signing. Why	Allow wait time based on your knowledge of the student's needs.

<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes, that is a point on this graph."</p> <p>If the student is incorrect, re-teach/model using the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>It, on, here</p>	
<p>Make explicit what the students were thinking and doing</p> <p>Describe what you saw the student do.</p> <p>Example: "You looked on the graph. You found the dots on the square. Those are points. Points show where (numbers/items) can be found on a graph."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, look, on, it here</p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p>Formative Assessment (option)</p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Recognize Ray



Purposes

Students will be able to identify a ray based on its attributes (a ray is a line that has a well-defined starting point).

- **M.EE.G.CO.1** Know the attributes of perpendicular lines, parallel lines, and line segments, angles, and circles

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Pictures of rays, other items that have rays in them such as graphs, maps, books.
- **Is it a Line, ray, or point?**
https://docs.google.com/document/d/1OeUGp3wmQ31taqxBm7pGHaGlxCOb0GSPv_bHFuYp8dg4/edit
- **What's the point of Geometry? Euclid explains it nice and easy!** (video)
https://www.youtube.com/watch?v=_KUGLOiZyK8
- <https://shared.tarheelreader.org/shared/read/a-rainy-morning> (shared reading book)

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Watch video about Euclid and points/lines.</p> <p>Or</p> <p>Complete a shared reading activity with <i>A Rainy Morning</i>. Make connections to the sun's rays streaming down. They start at the sun (fixed</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Here, go, stop, on, it, look</p>	<p>This may be a review of points and lines.</p> <p>Students with vision impairments should be provided with tactile versions of the points and lines. Glue and small round objects or glitter can</p>

point) and come down to shine on us. Go outside if possible and feel the sun's rays.		be used to make the models tactile. https://shared.tarheelreader.org/shared/read/a-rainy-morning
<i>Establish a purpose</i> <i>"Today we will learn to identify rays."</i>	Model using student's form of communication. For example: AAC, Braille, signing. <i>Look, start, finish, go, you</i>	
<i>Teach and model the concept</i> Show examples and non-examples. For example: Show a ray. <u>Say:</u> <i>"A ray is like a line. A ray has one starting point. A ray goes in one direction. There is one arrow to show in which direction the ray goes. This is a ray."</i> Show a point. <u>Say:</u> <i>"This is one point. There are no arrows. This is not a line or a ray. This is a point."</i> Show a line. <u>Say:</u> <i>"This is a line. A line goes in both directions. A line has arrows on both sides."</i> Model with other pictures.	Model using student's form of communication. For example: AAC, Braille, signing. <i>Here, on, it, stop, finished, go</i>	For students with vision impairments, provide tactile examples. Glue and glitter or sand can be used to raise the figures for the student to feel them. Be cognizant of which figures you have directly taught. If point or ray has not been directly taught do not use that vocabulary in this lesson as it may cause confusion. Instead point out the lack of defining attributes.
THINK AND DO		
<i>Students think about what to do:</i> Provide the student with three choices which includes one diagram of a ray. <u>Say:</u> <i>"Show me the ray."</i>	Model using student's form of communication. For example: AAC, Braille, signing. <i>Look, get, it</i>	Include rays in many different contexts.

<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should indicate the ray.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe and record the student's responses.</p> <p>The student may use eye gaze, peer assisted scanning, or verbal/AAC to direct an adult.</p>
APPLY		
<p>Students describe what was done.</p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "It go here." "It finished." "It stop." "I look."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Why</p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes, that is a ray."</p> <p>If the student is incorrect, re-teach/model using the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, look, it, here</p>	
<p>Make explicit what the students were thinking and doing</p> <p>Describe what you saw the student do.</p> <p>Example: "You looked for the figure with one arrow. The ray has a starting point. A ray</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure</p>

goes in one direction. Great job finding the ray!"	<i>You, look, it, here, stop, finished, go</i>	and reinforce the thinking process.
Formative Assessment (option) <input type="checkbox"/> Did not attend/no response <input type="checkbox"/> Attended/no response <input type="checkbox"/> Attended/response incorrect <input type="checkbox"/> Attended/response partially correct <input type="checkbox"/> Attended/response fully correct		

Recognize Right Angles



Purposes

Students will be able to identify right angles based on their attributes (measures exactly 90 degrees).

- **M.EE.G.CO.1** Know the attributes of perpendicular lines, parallel lines, and line segments, angles, and circles

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this lesson: Pictures of angles, lines, rays, points, line segments; items that have angles (books, notebooks, door jam, whiteboards, windows, boxes, etc.)

*(Students should already be able to recognize an angle among other geometric figures. If they are not proficient with that skill consider re-teaching the following lesson **DP: 6-8 Recognize angle***

<https://docs.google.com/document/d/1vz38ogm5C6TOtHD26emWMCxVu5CFZGDkDya3vpWKQKY/edit>

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Go on a class treasure hunt to find a variety of angles. A mix of real objects and 'hidden' pictures can be used.</p> <p>Once 8-10 angles have been 'collected,' the students should sort them into categories of their choosing. Ideally they will have corners (right angles), small angles (acute angles), and larger angles (obtuse angles).</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Here, it, stop, on, go, open, more, not</p>	<p>When using pictures, make them tactile with glue and string to allow students with vision impairments to feel them. Students with physical limitations, may have items placed within their reach to explore.</p>

<p>Establish a purpose</p> <p>"Today we will learn about angles."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Look, do</p>	
<p>Teach and model the concept</p> <p><u>Say:</u> "Right angles can be found everywhere. When you see a corner, that is a right angle. A right angle measures exactly 90 degrees."</p> <p>Walk around the classroom and/or show students examples of right angles. Also point out items that do not have right angles, such as a ball and other round objects. For each item, note if the angle is small, large or a corner like the door jam.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Go, on, here, it, stop</p>	<p>Other options for practice include going on a "field trip." Point out or have students find things and decide if it has right angles or no right angles. Students and/or adults can take pictures of the angles to make a reference book for the classroom.</p> <p>All students should have opportunities to feel the shape of the angles.</p> <p>Hand-under-hand could be used for students who require physical support. Provide opportunities for the students to feel you drawing the angles. You may also provide writing utensils and paper/whiteboards so the students can practice mark-making.</p>
<p>THINK AND DO</p>		
<p>Students think about what to do:</p> <p>Place several geometric figures in front of the student. Only one choice should include a right angle.</p>	<p>Model using student's form of communication. For</p>	<p>Other options for Think and Do include going on a "field trip." Point out items and</p>

<p><u>Say:</u> "Point to the right angle."</p>	<p>example: AAC, Braille, signing.</p> <p><i>Look, it, do, get</i></p>	<p>have the student decide if it has angles or no angles. They could have Yes/No response cards or use their Core board to respond.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should indicate the right angle.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe and record notes about the student's responses.</p> <p>The student may use eye gaze or peer-assisted scanning to select their choice.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "It up." It open." "Not more open."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes that is a right angle."</p> <p>If the student was incorrect, re-teach/model following the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You did it.</i></p>	

<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: “You found the picture that had an endpoint with two lines extending out. That is an angle. It makes a corner, just like the door. The angle is a right angle.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>On, here, go, it, look, stop</i></p>	<p>Expand on the student’s language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Recognize Structure of a Line Graph



Purposes

Students will be able to identify a line graph. Students will actively participate in the creation of line graph by placing dots for each response to the research question.

- **M.EE.S-ID.1-2** Given data, construct a simple graph (table, line, pie, bar, or picture) and interpret data.
- **M.EE.S-ID.3** Interpret general trends on a graph or chart

Materials

- Copy of Core Vocabulary board for each student
- Copy of formative assessment for each student
- List of materials that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- **Survey Questions to get you started** (You may also collect other kinds of data, such as hops per minute or shapes identified per minute, etc.)
https://docs.google.com/document/d/1ERKOZyl_R3m24haNooP1vxAkBDJwBL_YaA1gTfQbDo/edit
- **Bar Graph/Picture Graph or Not?**
<https://docs.google.com/document/d/1mBMWGeR6625LdX2I5aMMoSQu2aQjk24YXTtwHkoHF5E/edit>
- **Example graphs:**
https://docs.google.com/document/d/1Fv5HO9-yk_kXR0uRThgif441bLGqH9aMdSZ6uvbpd4Y/edit
- **Data Graphs (Bar, Line, Dot, Pie, Histogram)** (online graph creator)
<https://www.mathsisfun.com/data/data-graph.php>

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
Activate prior knowledge or build new knowledge Provide items to sort or a survey question for the students to ask peers and adults.	Model using student's form of communication. For example: AAC, Braille, signing.	

Once the items have been sorted or the surveys have been collected, move on to the next portion of the lesson.	You, do, it, here, like, not	
Establish a purpose “Today we will learn about line graphs.”	Model using student’s form of communication. For example: AAC, Braille, signing. We, go, here, it	
Teach and model the concept Using the sorted materials or the survey results, model creating a line graph. Describe it as you create it. For example: “We use line graphs when we collect data several times. Line plots or line graphs are made with dots and lines. (Model creating the graph using your collected data as you describe the parts.) We have an x-axis that goes across the bottom with a label. We have a y-axis which goes up and down on the side with a label. We look at both sides to decide where the point or dot goes. We put each point on the graph. Then we connect the points. This helps us see which way the graph goes.”	Model using student’s form of communication. For example: AAC, Braille, signing. Here, it, same, different, more, on, look	
THINK AND DO		
Students think about what to do: Place at least two, but no more than three graphs in front of the student. At least one should be the target type, for example, line graph. <u>Say:</u> “Show me the line graph.”	Model using student’s form of communication. For example: AAC, Braille, signing. You, look, where, it	For students with vision impairments, use tactile graphs using tiles, textured fabric, or other items. The structure of the graph (labels and rows/columns should be raised as well).
Students do: <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes 		Allow wait time for processing based on your knowledge of the student’s needs.

<ul style="list-style-type: none"> • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should indicate the correct target graph.</p>		<p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe and record the student's responses.</p> <p>The student may use peer-assisted scanning, eye gaze, or verbal/AAC to direct an adult.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "It go here (indicating across)." "It same. It different."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes. This is a line graph."</p> <p>If the student was incorrect, re-teach or model following the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You did it.</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: "You looked for the dots and lines. You know line graphs have dots that are connected with a line. Great job finding the line graph."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>It, go, here, same different, look</i></p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>

Formative Assessment (option)

- ☐ Did not attend/no response
- ☐ Attended/no response
- ☐ Attended/response incorrect
- ☐ Attended/response partially correct
- ☐ Attended/response fully correct

Recognize Structure of a Picture/Bar Graph



Purposes

Students will be able to identify a picture or bar graph. Students will actively participate in the creation of picture and bar graphs by placing representations or coloring in boxes for each response to the research question.

- **M.EE.S-ID.1-2** Given data, construct a simple graph (table, line, pie, bar, or picture) and interpret data.
- **M.EE.S-ID.3** Interpret general trends on a graph or chart

Materials

- Copy of Core Vocabulary board for each student
- Copy of formative assessment for each student
- List of materials that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- **Bar Graph/Picture Graph or Not?** Collection of various graphs for the students to decide if it is a bar graph or not. As you make various kinds of graphs, it is suggested that you keep them as samples for the future to use during practice activities or progress monitoring.
https://docs.google.com/document/d/1mBMWGeR6625LdX2I5aMMoSQu2aQjk24YX_TwhkoHF5E/edit
- Items to sort for the creation of a picture or bar graph (Ex: toys, types of books, snack items students like)
- **Survey Questions to get you started** (You may also collect other kinds of data.)
https://docs.google.com/document/d/1ERKOZyl_R3m24haNooP1vxAkBDJwBL_YaA1gTfQbDo/edit

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Provide items to sort or a survey question for the students to ask peers and adults.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	

Once the items have been sorted or the surveys have been collected, move on to the next portion of the lesson.	<i>You, do, it, here, like, not</i>	
<i>Establish a purpose</i> <i>“Today we will learn about picture graphs.”</i>	Model using student’s form of communication. For example: AAC, Braille, signing. <i>You, I, make, it</i>	When you work on a bar graph, change the wording.
<i>Teach and model the concept</i> Using the sorted materials or the survey results, model creating a bar graph or a picture graph. Bar graphs are made up of bars showing how many responses or items are in each group. Picture graphs are made up of pictures that represent an amount of each item. Select one of the types to create. For this example we will make a picture graph. Example: <i>“To make a picture graph we first need to decide on the pictures. In this case, we sorted some fruits into 3 different categories. We have apples, bananas, and oranges. We will use a picture of an apple, a picture of a banana, and a picture of an orange on our picture graph. I will label the categories along the side here. (Model writing in the labels.) Now we need to count how many fruits are in each category. Let’s start with apples. 1-2-3. 3 apples. I will put 3 pictures of an apple across the row that says apples. (Model gluing/attaching the pictures.) Each apple picture represents each apple we counted. Now we need to count the bananas. 1-2-3-4. 4 bananas. I will put 4 pictures of a banana across the row that says bananas. Finally, we will count the oranges. 1-2. 2 oranges. I will put 2 pictures of an orange across the row that says oranges. Notice the picture graph uses pictures of the items we sorted. It has rows. This is a picture graph.”</i>	Model using student’s form of communication. For example: AAC, Braille, signing. <i>Here, it, same, different, more, on, look</i>	In future lessons directly teach the other type of graph. Modeling the creation of different kinds of graphs should be provided on a regular basis to provide context. The students will then practice identifying the different types of graphs. For students with vision impairments, use tactile graphs using tiles, textured fabric, or other items. The structure of the graph (labels and rows/columns should be raised as well).

THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place at least two, but no more than three graphs in front of the student. At least one should be the target type, for example, picture graph.</p> <p><u>Say:</u> “Show me the picture graph.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, look, where, it</i></p>	<p>For students with vision impairments, use tactile graphs using tiles, textured fabric, or other items. The structure of the graph (labels and rows/columns should be raised as well).</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should indicate the correct target graph.</p>		<p>Allow wait time for processing based on your knowledge of the student’s needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe and record the student’s responses.</p> <p>The student may use peer-assisted scanning, eye gaze, or verbal/AAC to direct an adult.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> “How do you know?”</p> <p>We are looking for the actions they went through to get the answer. Example: “It go here (indicating across).” “It same. It different.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student’s needs.</p>

<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes. This is a picture graph."</p> <p>If the student was incorrect, re-teach or model following the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You did it.</p>	
<p>Make explicit what the students were thinking and doing</p> <p>Describe what you saw the student do.</p> <p>Example: "You looked for the pictures. You know picture graphs have pictures and go across. Great job finding the picture graph."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>It, go, here, same different, look</p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p>Formative Assessment (option)</p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Recognize Structure of a Pie Chart



Purposes

Students will be able to identify a pie chart. Students will actively participate in the creation of pie charts by placing representations for each response to the research question.

- **M.EE.S-ID.1-2** Given data, construct a simple graph (table, line, pie, bar, or picture) and interpret data.
- **M.EE.S-ID.3** Interpret general trends on a graph or chart

Materials

- Copy of Core Vocabulary board for each student
- Copy of formative assessment for each student
- List of materials that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- **Bar Graph/Picture Graph or Not?** Collection of various graphs for the students to decide if it is a bar graph or not. As you make various kinds of graphs, it is suggested that you keep them as samples for the future to use during practice activities or progress monitoring.
<https://docs.google.com/document/d/1mBMWGeR6625LdX2I5aMMoSQu2aQjk24YXTtwhkoHF5E/edit>
- Items to sort for the creation of a picture or bar graph (Ex: toys, types of books, snack items students like)
- **Survey Questions to get you started** (You may also collect other kinds of data.)
https://docs.google.com/document/d/1ERKOZyl_R3m24haNooP1vxAkBDJwBL_YaA1gTfQbDo/edit

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
Activate prior knowledge or build new knowledge Provide items to sort or a survey question for the students to ask peers and adults.	Model using student's form of communication. For example: AAC, Braille, signing. You, do, it, here, like, not	

<p>Once the items have been sorted or the surveys have been collected, move on to the next portion of the lesson.</p> <p>You may also wish to complete a Predictable Chart Writing activity about pies. "I like ____ pie."</p>		
<p><i>Establish a purpose</i></p> <p>"Today we will learn about pie charts."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, I, make, it</i></p>	
<p><i>Teach and model the concept</i></p> <p>Using the sorted materials or the survey results, model creating a pie chart.</p> <p><u>Say:</u> "We are going to use our data to make a special kind of graph. It is called a pie chart. A Pie Chart looks like a pie. We use a pie chart to show how much of a whole each category represents. If we want to show how many people like each kind of pie, we can use a pie chart. We add up all of the responses. There are ten of us so that is the total. Five of us like cherry. Two of us like apple. Three of us like pumpkin. Five is half of ten so I can color in half of my circle with red to represent cherry. Three of us like pumpkin. That is about one-third of us, so I will color in one-third of the circle in orange. Two of us like apple, so I will color in the last section with yellow. There is a pie chart showing the different kinds of pie we like to eat."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Here, it, same, different, more, on, look</i></p>	<p>Pie Chart (https://www.mathsisfun.com/data/pie-chart.html)</p> <p>Please note that the students are not expected to understand or complete the math to create the pie chart. It should be modeled for them; however, so use small quantities to model.</p> <p>Model using other topics besides preferences for pies to ensure that students understand a pie chart can be used to show data related to other topics.</p> <p>For students with vision impairments, use tactile graphs using tiles, textured fabric, or other items. The structure of the</p>

		graph (labels and rows/columns should be raised as well).
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place at least two, but no more than three graphs in front of the student. At least one should be the target type, for example, pie chart.</p> <p><u>Say:</u> “Show me the pie chart.”</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, look, where, it</i></p>	<p>For students with vision impairments, use tactile graphs using tiles, textured fabric, or other items. The structure of the graph (labels and rows/columns should be raised as well).</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should indicate the correct target graph.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe and record the student's responses.</p> <p>The student may use peer-assisted scanning, eye gaze, or verbal/AAC to direct an adult.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> “How do you know?”</p> <p>We are looking for the actions they went through to get the answer. Example: “It go turn.” (To indicate it is round.)</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>

<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes. This is a pie chart."</p> <p>If the student was incorrect, re-teach or model following the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You did it.</p>	
<p>Make explicit what the students were thinking and doing</p> <p>Describe what you saw the student do.</p> <p>Example: "You looked for the graph that looked like a pie. That is a pie chart. Great job!"</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, look, here, it</p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p>Formative Assessment (option)</p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Arrange Objects in Pairs



Purposes

The students will be pairing up like items. First use concrete objects and then transition to representations of objects (pictures).

- **M.EE.S-CP.1-5** Identify when events are independent or dependent.
- **M.EE.S-IC.1-2** Determine the likelihood of an event occurring when the outcomes are equally likely to occur.
- **M.EE.A-REI.10-12** Interpret the meaning of a point on the graph of a line. For example, on a graph of pizza purchases, trace the graph to a point and tell the number of pizzas purchased and the total cost of the pizzas
- **M.EE.F-BF.1** Select the appropriate graphical representation (first quadrant) given a situation involving constant rate of change.
- **M.EE.F-IF.1-3** Use the concept of function to solve problems.
- **M.EE.F-IF.4-6** Construct graphs that represent linear functions with different rates of change and interpret which is faster/slower, higher/lower, etc.
- **M.EE.F-LE.1-3** Model a simple linear function such as $y=mx$ to show that these functions increase by equal amounts over equal intervals.

Materials

- Refer to the Collections List found here and gather a variety of items that can be put in pairs and act as distractors:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- Copy of a Core Vocabulary Board for each student
- Copy of the Formative Assessment for each student
- **Blank T-Chart**
<https://docs.google.com/document/d/1gumrCdszzwEI7mS-Xl4q9zHJbDQirEu6lJhncly1m8Y/edit>
- For this example lesson: 2 identical highlighters, 2 identical notebooks, 2 identical pattern blocks, 2 clothespins, 2 plastic spoons

EMERGENT SET 3
(HS Target EEs)

Composing/ Decomposing Lesson Plans

Initial Precursor

Purposes

The student will develop further understanding of combining (composing) things into sets. Students will also develop their ability to notice how the size of the sets changes with each combining (composing) action. Please use the vocabulary that matches your goals.

*(*Please note that there is a shared reading opportunity along with science connections with this lesson during the cooking and shared reading activities.)*

- **M.EE.A-CED.1** Create an equation involving one operation with one variable, and use it to solve a real-world problem.
- **M.EE.A-SSE.1** Identify an algebraic expression involving one arithmetic operation to represent a real-world problem.
- **M.EE.A-SSE.3** Solve simple algebraic equations with one variable using multiplication and division.
- **M.EE.N-RN.1** Determine the value of a quantity that is squared or cubed.
- **M.EE.A-CED.2-4** Solve one-step inequalities.

Materials

- Core Vocabulary board for each student
- Number strip for each student
 - **Number line access resources:**
https://docs.google.com/document/d/1bZJQ5SHTqPr8cg84oXoz2OP07fIBOZX_YLI-j3MDISQ/edit
- Copy of Formative Assessment document for each student
- Ingredients for a recipe. **Resources can be found here:**
<https://accessiblechef.com/#backtotop>
- Items to count
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: 5 yellow counting cubes, 5 red counting cubes, 10 2-sided probability counters. (The number of yellow and red will change depending on which side is visible.)
 - **Learning Resources Two-Color Counters, Red/Yellow, Educational Counting, Sorting, Patterning, and Probability Activities, Set of 200, Grades K+, Ages 5+**
<https://www.amazon.com/Learning-Resources-Color-Counters-Yellow/dp/B0017D9BDG>
- **Sorting mat:**

<https://docs.google.com/document/d/1lDd44XVFjhwukHKCRcKczwT58vN9Asfz4-fobhEdWiE/edit>

- **Combine/compose vocab card:**

https://docs.google.com/document/d/19wGXuWxViK5LPEHTO5n_QO_lhNFUjOJEoz68sRPP5I/edit

- Chart paper and markers

(It is suggested that students of this age should have opportunities to combine/compose real life items as well. Items may include, but are not limited to: items of clothing, different kinds of snacks, CDs/games, books, coins, eating/cooking utensils, etc.)

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Begin with a shared reading activity (see notes for an option)</p> <p>Cooking activities lend themselves to understanding “combining.”</p> <p>Select a fun recipe to make during class and talk about combining the ingredients.</p>	<p>Model using student’s form of communication.</p> <p><i>I, you, put, here, in, some, all, more, not more, up, that, in</i></p>	<p>Shared reading activity: https://shared.tarheelreader.org/shared/read/mountain-brownies</p> <p>While cooking, use terms to describe the attributes of each of the items. Include color, texture, smell, quantity, etc. These kinds of activities work well for engaging students and improving joint attention. While cooking, use sight, sound (music), movement, and touch to encourage engagement and attention.</p>
<p>Establish a purpose</p> <p><u>Say:</u> “We will be “combining” or “composing” smaller sets or groups of items into bigger</p>	<p>Model using student’s form of communication.</p> <p><i>Put, more</i></p>	

<p>things like we took the ingredients we had and made ____."</p>		
<p><i>Teach and model the concept</i></p> <p><u>Say:</u> "When we put things together we "combine" them or "compose" them."</p> <p>Place 5 red counting cubes and 5 yellow counting cubes on the table in clearly marked sets. Use the sorting mat listed above as needed.</p> <p><u>Say:</u> "There are 2 sets of cubes. One set is yellow. 1-2-3-4-5 yellow cubes. One set is red. 1-2-3-4-5 red cubes. I can combine them into one set because they are all cubes. 1-2-3-4-5-6-7-8-9-10 cubes all together. I started with two small sets. Then I combined them. I now have one large set. When I combine sets or groups of things I make a larger set. The set then has more."</p> <p>Repeat with at least two more variations of groupings using the cubes and the counters. Model counting and Think Aloud about how the sets changed in size when they were combined.</p>	<p>Model using student's form of communication.</p> <p><i>Put, more, not more, here</i></p>	
<p>THINK AND DO</p>		
<p><i>Students think about what to do:</i></p> <p>Place two sets of items in front of the student. For example a set of 3 red counters and a set of 2 yellow counters.</p> <p>Ask the student to count the items in each set. Possibly provide assistance by counting out loud while you ask the student to count in their head and demonstrate 1:1 correspondence.</p> <p>Ask the student to combine (compose) the two sets.</p> <p>Ask the student which was larger, one of the first sets or the final set.</p>	<p>Model using student's form of communication.</p> <p><i>Put, you, it, here, in</i></p>	<p>Provide wait time.</p>

<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>Student should count each set and then combine and count the large set</p> <p>*As the student makes the sets, either draw each result or have another identical set of items for comparison during the feedback stage.</p>		<p>Other than assistance with counting, (the focus is on combining at this point rather than counting skills) or prompts to complete the task, there should be no adult coaching at this time.</p> <p>If the student has physical limitations, the student may use eye gaze, a stick to push items together, or direct an adult by using the Core vocabulary words "Put in."</p> <p>Provide ample wait time based on your knowledge of the student's processing needs.</p> <p>If the student does not engage with the materials, work on joint attention and engagement by using sight, sound, light, touch, and movement to gain the student's attention and encourage exploration of the materials.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Say:</u> "Tell me what you did."</p> <p>Example: "I counted." "I put together."</p>	<p>Model using student's form of communication.</p> <p><i>I, put</i></p>	

<p>Get feedback</p> <p>Using another set identical to the student's set or a drawing, compare the student's result to how it should look.</p> <p>Ask: "Which had more?"</p>	<p>Model using student's form of communication.</p> <p>More, not more, here, it</p>	<p>Ask the student to count in their head as you count.</p>
<p>Make explicit what the students were thinking and doing</p> <p>Expand on their thinking processes. Make it "visible."</p> <p>"You first counted each set (model counting) and then you put them all together because you knew combine (compose) means to put them together. Then you counted all of them. Great job combining!"</p>	<p>Model using student's form of communication.</p> <p>You, put, here, it, some, more</p>	<p>Ask the student to count in their head as you count.</p>
<p>Formative Assessment (option)</p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Partition Sets



Purposes

Students will develop their ability to separate a collection of items into two distinct sets based on a given characteristic. Students will also develop their ability to notice how the size of the sets changes with each partitioning action.

- **M.EE.A-CED.1** Create an equation involving one operation with one variable, and use it to solve a real-world problem.
- **M.EE.A-SSE.1** Identify an algebraic expression involving one arithmetic operation to represent a real-world problem.
- **M.EE.A-SSE.3** Solve simple algebraic equations with one variable using multiplication and division.
- **M.EE.A-CED.2-4** Solve one-step inequalities.

Materials

- If the student is still challenged by the vocabulary begin with this lesson:
 - **IP: K-5 "Partition" Lesson Routine**
<https://docs.google.com/document/d/1158S2aj2DvTyunFnrruOn9Ue-S5opkcVjHw3pN44Qw/edit>
- Core Vocabulary board for each student
- Number strip for each student
 - **Number line access resources:**
<https://docs.google.com/document/d/1bZJQ5SHTqPr8cg84oXoz2OP07fIBOZXyLI-j3MDISQ/edit>
- Copy of Formative Assessment document for each student
- Items to count
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: 5 yellow counting cubes, 5 red counting cubes, 10 2-sided probability counters. (The number of yellow and red will change depending on which side is visible.)
 - **Learning Resources Two-Color Counters, Red/Yellow, Educational Counting, Sorting, Patterning, and Probability Activities, Set of 200, Grades K+, Ages 5+**
<https://www.amazon.com/Learning-Resources-Color-Counters-Yellow/dp/B0017D9BDG>
- **Sorting mat:**
<https://docs.google.com/document/d/1lDd44XVFjhwukHKCRcKczwT58vN9Asfz4-fobhEdWiE/edit>

- Chart paper and markers

(It is suggested that students of this age should have opportunities to sort real life items as well. Items may include, but are not limited to: items of clothing, different kinds of snacks, CDs/games, books, coins, eating/cooking utensils, etc.)

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p><u>Ask:</u> "How could we make smaller groups out of our class?"</p> <p>Discuss answers/Think Aloud: "We could make groups of boys and girls." Proceed to move the students into that grouping.</p> <p>"We could make groups based on hair color." Proceed to moves students into that grouping.</p> <p>Allow the student to touch and feel the items to be used in the lesson. Talk about their attributes (color, shape, size, texture, use)</p>	<p>Model using student's form of communication.</p> <p>Put, some, here</p>	<p>For a shared reading activity: https://shared.tarheelreader.org/shared/read/how-to-sort</p> <p>Allow for processing time.</p> <p>This is an excellent opportunity to work on engagement and joint attention. When sorting students into groups you could use music and silly movements to increase their engagement. This can also be applied when they are feeling the sorting items. Use light, sound, touch, and movement to engage them in the activity.</p>
<p>Establish a purpose</p> <p>"We will be making groups or partitioning sets. Partitioning can help us share things and solve problems."</p>	<p>Model using student's form of communication.</p> <p>Get, more</p>	

<p>Teach and model the concept</p> <p>Say: "We can make different groups by looking at the different attributes (color, shape, size, texture, use) and placing similar items into each group."</p> <p>Place the items on the table.</p> <p>Model: "I can use color to partition my items into groups. I see red things and yellow things. I will make two groups." Proceed to make the groups. Then count the items in each group and tell how many are in each group. For example: "I counted 10 yellow items and 10 red items."</p> <p>Repeat at least two more times with different groupings. State the characteristic by which you are sorting. Then sort. Next count the items in each set. Think Aloud if the sets got larger or smaller.</p>	<p>Model using student's form of communication.</p> <p><i>I, put, some, here</i></p>	<p>This is another opportunity to work on joint attention and engagement. Use light, sound, touch, and movement with the items to engage them in the activity.</p>
THINK AND DO		
<p>Students think about what to do:</p> <p>Place the items in front of the student and ask them to sort by a given characteristic.</p> <p>The student may also choose by which characteristic they wish to sort. Provide the sorting mat as necessary.</p> <p>The student (with help if necessary) should count how many in each set.</p>	<p>Model using student's form of communication.</p> <p><i>I, put, some, here</i></p>	<p>The teacher can keep track on chart paper the different ways in which the student sorts and how many are in each set. This makes comparing sets and noticing differences easier in the later steps of the lesson.</p>
<p>Students do:</p> <ul style="list-style-type: none"> ● Solve the problem ● Build the model ● Find the matching shapes ● Put them in order ● Interpret the data, etc. ● Describe/share answer <p>The student should sort and then count the items in each set.</p>	<p>Model using student's form of communication.</p> <p><i>More, not more</i></p>	<p>There should be no adult coaching at this time.</p> <p>Prompts to engage and complete the task can be given.</p> <p>This is another opportunity to work on joint attention and</p>

<p>After at least two sorts have been done, <u>ask</u>:</p> <ul style="list-style-type: none"> • "Which way of sorting had bigger sets?" • "Which way of sorting had smaller sets?" 		<p>engagement. Use light, sound, touch, and movement with the items to engage them in the activity.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask</u>:</p> <ul style="list-style-type: none"> • "How did you decide to sort your groups?" • "How did you know one set was bigger?" • "How did you know one set was smaller?" 	<p>Model using student's form of communication.</p> <p><i>You, more, not more, some, here</i></p>	
<p><i>Get feedback</i></p> <p>For each sort, model counting the items and helping the student check for accuracy. Compare the sets from one sort to the other using the diagrams.</p> <p>Model the language, counting and 1:1 correspondence</p> <p>For example: "I counted 6 (1-2-3-4-5-6) in this set and 14 (count to 14) in this set. The set with 14 has more things. It is bigger. It has more. You had the same answer. Great job counting."</p>	<p>Model using student's form of communication.</p> <p><i>You, more, not more, some, here</i></p> <p>Also model finding the numbers on the student's number line.</p>	<p>Ask the student to count in their head as you count.</p>
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Expand on their thinking processes. Make it "visible."</p> <p>Example: "I saw you look (feel) the items and compare their shape. Then you put all of the cubes in one group and all of the counters in another group. Then you put them in rows and touched each one to count the total. You partitioned the large set into smaller sets."</p>		

Formative Assessment (option)

- ☐ Did not attend/no response
- ☐ Attended/no response
- ☐ Attended/response incorrect
- ☐ Attended/response partially correct
- ☐ Attended/response fully correct

Use Perceptual Subitizing



Purposes

Students will develop the ability to quickly identify small amounts of objects (1-3). (**Please note that this is a combined literacy and math lesson. It begins with a shared reading activity.*)

- **M.EE.N-Q.1-3** Express quantities to the appropriate precision of measurement. (perceptual subitizing)

Materials

- Core Vocabulary board for each student
- Number strip (or equivalent that has access to at least the numbers 1-3 for each student
 - **Number line access resources:**
https://docs.google.com/document/d/1bZlQ5SHTqPr8cg84oXoz2OP07fIBOZX_YLI-j3MDISQ/edit
- Copy of Formative Assessment document for each student
- Items to count (this lesson SHOULD be repeated frequently with all small quantities of items):
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- Other possible materials to use, especially for students who have vision or physical limitations:
 - **Numicon blocks**
https://www.amazon.com/Numicon-Homework-Activities-Intervention-Resources/dp/0198487061/ref=asc_df_0198487061/?tag=hyprod-20&linkCode=df0&hvadid=312446862670&hvpos=&hvnetw=g&hvrnd=1700151285987297546&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9017921&hvtargid=pla-494051781297&psc=1
 - Base Ten blocks
- For this example lesson: 3 connecting cubes
- **Other subitizing activities can be found here** (you will need to create a free account to access the resources):
https://learningtrajectories.org/index.php/learning_trajectories/get_trajectory_details/1
- Information about shared reading can be found here:
 - **Texts Resources**
https://docs.google.com/document/d/1dYCbX9mkEcTiX2QvtynWt3DLP9U_hu_dDwWsER5W3ZZg/edit

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Begin with the shared reading activity.</p> <p>Ask students to count things (e.g. hands, feet, books, etc.) they are familiar with: "How many ___ do you have?"</p>	<p>The shared reading link has Core vocabulary access along the bottom with example comments in the top left corner of the pages.</p> <p>Model using the student's number line.</p> <p>Model using the student's form of communication.</p> <p><i>You, all, some, it, on</i></p>	<p>https://shared.tarheelreader.org/shared/read/counting-from-1-to-5</p>
<p>Establish a purpose</p> <p>"Today we will practice counting up to 3 things quickly."</p>		
<p>Teach and model the concept</p> <p>Place one cube in front of student: "I see one cube." Touch the cube while saying "one."</p> <p><u>Say:</u> "I am going to count the cube again. When I say it out loud, you say it in your head - 'one.'"</p> <p>Repeat this process with "two" and "three."</p>	<p>Model using the student's number line.</p> <p>Model using the student's form of communication.</p> <p><i>I, you, it, one, two, three</i></p>	<p>Remind the student to say the numbers in their head as they touch the number on their number line (or equivalent, such as a number card, allowing visual/tactile access to digits 1-3).</p> <p>This is also an opportunity to work on joint attention with the student. Use novel items, light, touch, movement and sound to encourage attention to the counting activity.</p>

THINK AND DO

Students think about what to do:

"I will quickly show you some cubes in my hand. Then I will ask you how many."

Show some cubes (1, 2, or 3) in the palm of your hand for 1-3 seconds.

**Repeat this activity frequently in short sessions to develop this skill.*

Model using the student's form of communication.

I, you

The amount of time you allow the student to look will be dependant on your knowledge of the student's processing time. It should be no more than a few seconds as the goal is to increase their ability to instantly recognize small quantities.

For vision impaired students, place the cubes in their hand or tap them on the table one at a time.

Students do:

- Solve the problem
- Build the model
- Find the matching shapes
- Put them in order
- Interpret the data, etc.
- Describe/share answer

Student should look at cubes, then indicate how many he/she saw.

There should be no adult coaching at this time. Feedback will be given in the next section.

Prompts to provide an answer or use the number line may be given.

Provide ample wait time based upon your knowledge of the student's processing needs.

This is also an opportunity to work on joint attention with the student. Use novel items, light, touch, movement and sound to encourage attention to the counting activity.

APPLY		
<p><i>Students describe what was done.</i></p> <p>If the student gives an answer or makes a vocalization or movement, <u>ask</u>: “How did you know?”</p>		<p>Try to attribute meaning to any action the student makes during this time. We want to encourage responses.</p>
<p><i>Get feedback</i></p> <p>Show the student the cubes again and ask the student to count with you (if non-verbal, ask that they count in their head).</p> <p><u>Ask</u>: “Does it match?”</p>	<p>Model using the student's number line. Possibly placing the items on the number line to show the connection.</p> <p>Model using the student's form of communication.</p> <p><i>It same?</i></p>	<p>This is also an opportunity to work on joint attention with the student. Use novel items, light, touch, movement and sound to encourage attention to the counting activity.</p>
<p><i>Make explicit what the students were thinking and doing</i></p> <p>“I saw you look at (listen for) the cubes. You thought about how many there were.”</p>	<p>Model using the student's form of communication.</p> <p><i>I, see, you, here</i></p>	
<p><i>Formative Assessment (option)</i></p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		



Distal Precursor

Demonstrate Concept of Multiplication/Division



Purposes

Students will work on developing an understanding of equal shares by actively participating in one-to-one distribution of objects to people (e.g., giving each person in the group two pencils), objects to objects (e.g., given four counters, they would line up four more counters in front of or on top of the first set), and objects to available space (e.g., given three chairs at a table, the student places a cup on the table for each available chair). Students will work on dividing a whole into equal shares (e.g., having 15 counters and 3 people in the group, give one to each person until there are no more, then count how many each person received). (NOTE: Start with small sets and multiply them. Connect to repeated addition.)

- **M.EE.A-SSE.3** Solve simple algebraic equations with one variable using multiplication and division.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items to use for instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- Materials will vary depending on the chosen activity

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Use an upcoming or already planned craft or art activity.</p> <p>Place all of the needed materials in the middle of the group</p> <p>Provide directions and model as usual. Instead of immediately handing out the materials, just give the direction to begin, then wait. Wait for a student to indicate that they need materials to begin. When one student has noticed and</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, put, here, same, on</p>	<p>Resources/Ideas to get you started:</p> <p>10 Easy Crafts for Kids with Motor Disabilities: https://coachart.org/blog/10-easy-crafts-for-kids-with-motor-disabilities/ </p>

<p>shows a desire to begin and would like to have them materials, talk about the best way to get everyone materials so they have equal amounts. This can be turned into a quick social skills lesson as well. Discuss how they can't just grab what they need.</p>		<p>5 Simple Art Projects For a Child with Special Needs: https://www.autismparentingmagazine.com/art-projects-for-special-needs/</p> <p>Inclusion/Special Needs Art Projects Archives: https://www.deepspac.esparkle.com/category/art-lessons-by-subject/inclusionspecial-needs-art-projects/</p>
<p><i>Establish a purpose</i></p> <p>“Today we will learn how to help pass out materials so everyone gets an equal share.”</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Put, same</i></p>	<p>This lesson/practice can also be done during snack time, a regular lesson time, as a classroom job, etc.</p> <p>Provide multiple opportunities to practice and for the students to get feedback about partitioning things among the students.</p>
<p><i>Teach and model the concept</i></p> <p>Say: “When we do a project, everyone needs the same amount of materials. For example, you will each need one piece of red construction paper (adjust this per your craft or project). Set one piece of paper in front of each student.” Model.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Same, you, put, here</i></p>	<p>Based on your knowledge of student behaviors, classroom expectations, physical challenges and the specific craft or activity, you will need to adjust what you say and how you model accordingly.</p> <p>The goal is to teach them to place the same amount in each designated spot.</p>

THINK AND DO		
<p>Students think about what to do:</p> <p>Give the student something to pass out. For example: "Give 2 pieces of green paper to each person."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, put, here, in</p>	<p>You may wish to provide a template on which to place the materials to cue for number and placement. As the student becomes more proficient, fade the template by making it smaller or not as noticeable.</p>
<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should place the item(s) in the appropriate locations.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe and make notes about the student's response to the directions.</p>
APPLY		
<p>Students describe what was done.</p> <p><u>Ask:</u> "What did you do?"</p> <p>We are looking for the actions they went through to get the answer. Example: "I put all." "I put on."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, put</p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Great job giving everyone 2 sheets of green paper!" If the student was incorrect, model how to place the items and provide the student some</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	

appropriate prompting to try it again immediately after modeling.	<i>You, do</i>	
<i>Make explicit what the students were thinking and doing</i> Describe what you saw the student do. Example: <i>“You gave each person 2 pieces of paper. You set the paper right in front of them so they could use it. Thank you!”</i>	Model using student’s form of communication. For example: AAC, Braille, signing. <i>You, put, on, in, here</i>	Expand on the student’s language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.
<i>Formative Assessment (option)</i> ___ Did not attend/no response ___ Attended/no response ___ Attended/response incorrect ___ Attended/response partially correct ___ Attended/response fully correct		

Explain Repeated Addition**Purposes**

When given multiple small sets, students will use repeated addition to find the total. They can check their work by counting the individual items in each group.

- **M.EE.N-RN.1** Determine the value of a quantity that is squared or cubed.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items to use during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Familiar items like pencils, erasers, counting tiles with which to count
- **Repeated Addition Mat:**
<https://docs.google.com/document/d/1UkH0QzY2jdMMrwi8nZy6dPGAXHJbUVeMIDFo-E-ejE/edit>
- **Word problems:**
https://docs.google.com/document/d/1wb6p4Kz0muxAQzR84lvm_HDjZOjSvBulJER0XutTP7A/edit

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<i>Activate prior knowledge or build new knowledge</i> Provide opportunities to hand out materials, snacks, or other items in a 1:1 fashion. For example, have a student hand out 2 markers to each person for art time, or exactly 3 crackers to each person for snack time. Reinforce that it is the same amount to each person.	Model using student's form of communication. For example: AAC, Braille, signing. <i>Some, all, put</i>	These kinds of activities should be done every day with differing amounts.
<i>Establish a purpose</i> "We will learn how to add multiple sets of the same number."	Model using student's form of communication. For	

	<p>example: AAC, Braille, signing.</p> <p><i>Some, more, same</i></p>	
<p><i>Teach and model the concept</i></p> <p>Allow the students to interact with the materials.</p> <p>Present the following problem to the students: (Remind them of when they handed out materials. The same amount to each person.)</p> <p><i>"Sally eats 2 cookies each day for 3 days. How many total cookies does she eat? I can solve this using repeated addition. Watch."</i></p> <p>Model placing 2 counters in each of 3 boxes across the top. <i>"1-2, 1-2, 1,2. I put 2 cookies/counters in 3 boxes to show that Sally ate 2 cookies each day. I can find out how many by counting all of them."</i></p> <p>Move all of the counters down to the large box. Model counting all of them. <i>"1-2-3-4-5-6. Sally ate 6 total cookies."</i></p> <p>Model at least 2 more times with 2 different problems.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Same, put, all, more, finished</i></p>	<p>Educators should take care to use words like "some", "all", "put", and "add" while defining and demonstrating their meaning. While students do not need to say these words, they do need to learn the meanings.</p> <p>Adjust the numbers to those with which your students can count and/or with which they are familiar. Start with total quantities less than 10 and then increase that as they improve their counting skills. The goal is to have them translate a problem that requires repeated addition into a concrete representation and then understand that they need to find the total by counting.</p>
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Select one of the word problems provided or make/use one of your own.</p> <p>Present the problem and the counters/mat to the student.</p> <p>State the question in the problem.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Same, put, all, more, finished</i></p>	<p>Provide ample wait time based on your knowledge of the student's processing needs.</p>

<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>Students should place the correct number of counters into the boxes as described in the problem.</p> <p>Once they have completed the first step to represent the problem, they should combine all of the counters into the bottom box. This process demonstrates their understanding of making small sets to show the problem set-up and then combining to find an answer.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe the student's responses and take notes.</p> <p>Repeat the problem as necessary for the student to understand and pick out the numbers to use.</p> <p>Allow students with vision impairments to use a 3D organizer instead of 2D.</p> <p>Students with physical limitations can use eye gaze, a pushing stick, and/or verbal/AAC to direct an adult.</p>
<p>APPLY</p>		
<p>Students describe what was done.</p> <p><u>Ask:</u> "How did you find the answer?"</p> <p>We are looking for the actions they went through to get the answer. Example: "I put some here. Same here (etc as appropriate). Put all here."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You</p>	<p>Allow wait time based on your knowledge of the student's needs.</p>

<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Great job finding the total!"</p> <p>If the student was incorrect, model how to solve the problem as above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, put, all, here</p>	
<p>Make explicit what the students were thinking and doing</p> <p>Describe what you saw the student do.</p> <p>Example: "Yes, you made 3 small sets to show each day. Then you combined them to find the total. Great job using repeated addition to solve the problem!"</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, put, all, here</p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p>Formative Assessment (option)</p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Represent Addition with Equations



Purposes

Students will be able to match an addition equation with sets that model that equation.

- **M.EE.A-CED.1** Create an equation involving one operation with one variable, and use it to solve a real-world problem.
- **M.EE.A-CED.2-4** Solve one-step inequalities.
- **M.EE.A-SSE.1** Identify an algebraic expression involving one arithmetic operation to represent a real-world problem.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Counting cubes, addition number sentences
- **Basic Facts Worksheet Generator** (use to create your number sentences):
<https://www.mathfactcafe.com/Worksheet/BuildIt>
- Whiteboard and markers or number sentences on individual cards
- <https://shared.tarheelreader.org/shared/read/addition>
- **Part Part Whole** or other graphic organizer of your choice:
http://www.eduplace.com/state/pdf/hmm/trb/1/1_03.pdf
- **Types of Addition and Subtraction Problems Samples use whole numbers:**
<http://www.homeofbob.com/math/numVluOp/wholeNum/addSub/adSubTypsChrt.html>

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Complete a shared reading activity using the provided Tar Heel Reader link in the notes. Comments should connect to previous work in demonstrating an understanding of addition.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Some, more, all, in</p>	<p>https://shared.tarheelreader.org/shared/read/addition</p> <p>IP: HS Combine Sets: https://docs.google.com/document/d/1_44U25S1CNfzBljgyPzJOFVX</p>

<p>You may also wish to review their skills in combining sets. See the lesson in the notes section.</p>		08jw4-Z5uQagXv9gAH A/edit
<p>Establish a purpose</p> <p>“Today we will learn to represent or write equations to show an addition problem.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p>Make, look</p>	
<p>Teach and model the concept</p> <p>Place the counting cubes and the Part Part Whole mat in front of the students. Allow them to interact with the materials for a few minutes.</p> <p>Using your students’ interests, state a problem and model placing the cubes in the appropriate spot on the mat. For example: “Sue gave Jim 2 flowers. Then John gave Jim 3 flowers. How many flowers does Jim have now?” Model writing the problem and counting the “flowers” on the whiteboard. “I can show this with numbers and symbols. 2 flowers plus 3 flowers = 5 flowers. That matches this equation.” (Show the prewritten equation.)</p> <p>Repeat with 2-3 more equations using the students’ interests to create context.</p> <p><i>*If teaching addition problems with an unknown addend, use the same routine, but model leaving an addend blank.</i></p> <p>For example: “Jim had no flowers. Sue gave Jim 2 flowers. Then John gave Jim some flowers. Jim now has 5 flowers. How many flowers did John give Jim?”</p> <p>“I will put 2 counters in the bottom left part box. I will then write a 2 to show Sue gave Jim 2 flowers. (Use the Part Part Whole mat with counters) Then it says John gave him some more flowers. I use a plus symbol to show Jim got more flowers, but I will put a</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p>Some, more, here, put, same</p>	<p>Begin with concrete sets of items and then use pictures of sets modeling addition.</p> <p>Only use numbers to which the student can rote count and for which they have a secure understanding.</p> <p>For students with vision impairments, you may make the boundaries of the mat sections tactile.</p> <p>Encourage the students to count with you either out loud or in their heads.</p> <p>This is also an opportunity for them to practice their mark-making. They can experiment with different instruments and surfaces.</p> <p>You may use other mats that show matching types of problems.</p>

<p>blank because we don't know how many. The problem says he now has 5 flowers so I will put 5 flowers in the top/whole box and write an equals sign with a 5 to show that is how many flowers Jim has now. $2 + \underline{\quad} = 5$. I can count up from two to see how many flowers John gave Jim. Count with me. Start with 2 then add counters to get to 5. 2-3-4-5. I had to add 3 more flowers to equal 5. $2 + 3 = 5$. I now look at my equations. This one matches. (Point to the matching equation.)"</p> <p>Model this kind of problem 2-3 times before asking the student to complete the Think and Do step.</p>		
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Present the student with a problem using the examples above. Model the problem. Provide 2-3 choices for equations.</p> <p><u>Say:</u> "Which equation matches the problem?"</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Some, more, here, put, same</i></p>	
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should select the equation that matches the problem.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe and make notes about the student's responses.</p> <p>The student may use eye gaze, peer-assisted scanning, or</p>

		verbal/AAC to make their selection.
APPLY		
<p><i>Students describe what was done.</i></p> <p>Ask: “How do you know?”</p> <p>We are looking for the actions they went through to get the answer. Example: “It same.” “It all.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student’s needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: “Yes that equation matches the problem.”</p> <p>If the student was incorrect, re-teach/model using the teaching script above.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You did it.</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: “You counted the items in each group. You found the equation with the same numbers. You found the equation with the same answer.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Here, some, in, all, same</i></p>	<p>Expand on the student’s language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Represent Division with Equations



Purposes

Students will be able to match a division equation with sets that model that equation.

- **M.EE.A-CED.1** Create an equation involving one operation with one variable, and use it to solve a real-world problem.
- **M.EE.A-CED.2-4** Solve one-step inequalities.
- **M.EE.A-SSE.1** Identify an algebraic expression involving one arithmetic operation to represent a real-world problem.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Counting cubes, division number sentences
- **Basic Facts Worksheet Generator** (use to create your number sentences):
<https://www.mathfactcafe.com/Worksheet/BuildIt>
- **Word Problems Worksheets | Division Worksheets with 1 Digit Divisor**
https://www.math-aids.com/Word_Problems/Division_1Digit_Divisor.html

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Watch video of "Divide and Ride." Provide concrete items to act out each ride situation.</p> <p>Alternatively, you can do your own read aloud if you have the book.</p> <p>You may also wish to review their skills in understanding the concept of division. See the lesson in the notes section.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Look, here, put, some, all</p>	<p>Divide and Ride Read Aloud: https://www.youtube.com/watch?v=ifRXZi8TCIQ</p> <p>DP: HS Demonstrate concept of multiplication/division: https://docs.google.com/document/d/1f6HfxHhnuv82BnckUR3IN2</p>

		cvieQnSBCZsbZtP73ryA/edit
<p>Establish a purpose</p> <p>“Today we will learn to represent or write equations to show a division problem.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p>Make, look</p>	
<p>Teach and model the concept</p> <p>Using your student’s interests, present a division problem.</p> <p>For example: “Sue had 6 cookies. She had 2 friends. If she share the cookies with her friends, how many cookies would they each get? To solve this problem, I can act it out with my counting cubes. I count out 6 cubes to represent the cookies. I can draw 3 circles on my whiteboard to show Sue and her two friends. Then I hand out the cookies evenly. 1-2-3-4-5-6. I gave each kid 2 cookies. I can write that in a number sentence like this. $6 \div 3 = 2$. Six cookies divided among 3 people equals 2 cookies for each person.” Show the written equation.</p> <p>Model 2-3 more times before moving onto the Think and Do activity.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p>Make, look, put, here, in, same, different</p>	<p>Begin with concrete sets of items and then use pictures of sets modeling division.</p> <p>Only use numbers to which the student can rote count and for which they have a secure understanding.</p> <p>Encourage the students to count with you either out loud or in their heads.</p> <p>This is also an opportunity for them to practice their mark-making. They can experiment with different instruments and surfaces.</p>
THINK AND DO		
<p>Students think about what to do:</p> <p>Present a simple division problem to the students. Assist them in modeling the solution of the problem.</p> <p>Provide 2-3 possible equations to represent the problem. Only one should be correct.</p> <p><u>Say:</u> “Show me the equation that matches the problem we just solved?”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p>Look, which, same</p>	

<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should select the matching equation.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe and record notes about the student's responses.</p> <p>The student may use eye gaze, a pushing stick, peer-assisted scanning or verbal/AAC to guide an adult.</p>
APPLY		
<p>Students describe what was done.</p> <p>Ask: "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "I look." "I put some here."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Why</p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes you chose the correct equation to show the problem."</p> <p>If the student was incorrect, re-teach/model using the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You did it.</p>	
<p>Make explicit what the students were thinking and doing</p> <p>Describe what you saw the student do.</p>	<p>Model using student's form of communication. For</p>	<p>Expand on the student's language. Use simple complete sentences. This is an</p>

Example: "You matched the numbers of counters in each circle to the equation."	example: AAC, Braille, signing. <i>Same, look, get, here</i>	opportunity to model sentence structure and reinforce the thinking process.
<i>Formative Assessment (option)</i> <input type="checkbox"/> Did not attend/no response <input type="checkbox"/> Attended/no response <input type="checkbox"/> Attended/response incorrect <input type="checkbox"/> Attended/response partially correct <input type="checkbox"/> Attended/response fully correct		

Represent Multiplication with Equations



Purposes

Students will be able to match a multiplication equation with sets that model that equation.

- **M.EE.A-CED.1** Create an equation involving one operation with one variable, and use it to solve a real-world problem.
- **M.EE.A-CED.2-4** Solve one-step inequalities.
- **M.EE.A-SSE.1** Identify an algebraic expression involving one arithmetic operation to represent a real-world problem.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Counting cubes, multiplication number sentences
- **Basic Facts Worksheet Generator** (use to create your number sentences):
<https://www.mathfactcafe.com/Worksheet/BuildIt>
- **Word Problems Worksheets | Multiplication Worksheets with 1 Digit**
https://www.math-aids.com/Word_Problems/Multiplication_1Digit.html

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Complete a shared reading of <i>Three times What?</i>. See link in the notes.</p> <p>You may also wish to review their skills in understanding the concept of multiplication. See the lesson in the notes section.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Some, more, all, in</i></p>	<p>https://shared.tarheelreader.org/shared/read/three-times-what-2</p> <p>DP: HS Demonstrate concept of multiplication/division</p> <p>https://docs.google.com/document/d/1f6HfxHhnuv82BnckURe3IN2cvieQnSBCZsbZtP73ryA/edit</p>

<p><i>Establish a purpose</i></p> <p>“Today we will learn to represent or write equations to show a multiplication problem.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Make, look</i></p>	
<p><i>Teach and model the concept</i></p> <p>Using your student’s interests, present a multiplication problem.</p> <p>For example: “Sue has some cookies to share. She has two friends. She wants to give each friend two cookies. How many cookies does she need? To solve this problem, I can act it out with my counting cubes. I will make 3 circles to represent Sue and her two friends. I will put two cookies in each circle to represent the two cookies she gives to each of them. Now I can count my cookies. 1-2-3-4-5-6. Three friends times two cookies equals six cookies total. We can write that using numbers and symbols like this $3 \times 2 = 6$.”</p> <p>Show the written equation.</p> <p>Model 2-3 more times before moving onto the Think and Do activity.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Make, look, put, here, in, same, different</i></p>	<p>Begin with concrete sets of items and then use pictures of sets modeling division.</p> <p>Only use numbers to which the student can rote count and for which they have a secure understanding.</p> <p>Encourage the students to count with you either out loud or in their heads.</p> <p>This is also an opportunity for them to practice their mark-making. They can experiment with different instruments and surfaces.</p>
<p>THINK AND DO</p>		
<p><i>Students think about what to do:</i></p> <p>Present a simple division problem to the students. Assist them in modeling the solution of the problem.</p> <p>Provide 2-3 possible equations to represent the problem. Only one should be correct.</p> <p><u>Say:</u> “Show me the equation that matches the problem we just solved?”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, which, same</i></p>	

<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should select the matching equation.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe and record notes about the student's responses.</p> <p>The student may use eye gaze, a pushing stick, peer-assisted scanning or verbal/AAC to guide an adult.</p>
APPLY		
<p>Students describe what was done.</p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "I look." "I put some here."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Why</p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes you chose the correct equation to show the problem."</p> <p>If the student was incorrect, re-teach/model using the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You did it.</p>	
<p>Make explicit what the students were thinking and doing</p> <p>Describe what you saw the student do.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model</p>

Example: "You matched the numbers of counters in each circle to the equation."	<i>Same, look, get, here</i>	sentence structure and reinforce the thinking process.
<i>Formative Assessment (option)</i> <input type="checkbox"/> Did not attend/no response <input type="checkbox"/> Attended/no response <input type="checkbox"/> Attended/response incorrect <input type="checkbox"/> Attended/response partially correct <input type="checkbox"/> Attended/response fully correct		

Represent Repeated Addition with a Model



Purposes

Students will be able to make a model of a repeated addition equation.

- **M.EE.N-RN.1** Determine the value of a quantity that is squared or cubed.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items to use during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Familiar items like pencils, erasers, counting tiles with which to count
- **Repeated Addition Mat:**
<https://docs.google.com/document/d/1UkH0QzY2jdMMrwfi8nZy6dPGAXHJbUVeMIDFo-E-ejE/edit>
- **Word problems:**
https://docs.google.com/document/d/1wb6p4Kz0muxAQzR84lvm_HDJZOjSvBulJER0XutTP7A/edit
- Whiteboard and marker, paper and pencil
- Equations matching the problems you will be using

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Provide opportunities to hand out materials, snacks, or other items in a 1:1 fashion. For example, have a student hand out 2 markers to each person for art time, or exactly 3 crackers to each person for snack time. Reinforce that it is the same amount to each person. After handing out the materials take a few minutes to model writing a related repeated math problem. Then share the problem. For</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, put, he/she, here, in</p>	

example: "You gave 2 markers to Tom. You gave 2 markers to Sam. You gave 2 markers to Sue. $2 + 2 + 2 = 6$ markers."		
<i>Establish a purpose</i> "Today we will learn how to show our repeated addition problems."	Model using student's form of communication. For example: AAC, Braille, signing. <i>Make</i>	
<i>Teach and model the concept</i> Allow the students to interact with the materials. Present the following problem to the students: <i>(Remind them of when they handed out materials, giving the same amount to each person.)</i> "Sally eats 2 cookies each day for 3 days. How many total cookies does she eat? I can solve this using repeated addition. Watch." Model placing 2 counters in each of 3 boxes across the top. "1-2, 1-2, 1,2. I put 2 cookies/counters in 3 boxes to show that Sally ate 2 cookies each day. I can find out how many by counting all of them." At this point, model writing $2 + 2 + 2$ on a whiteboard or paper. <u>Say:</u> "We can write numbers to show how many are in each box. The numbers tell us how many cookies Sally ate each day. When we want the total altogether, we can add. We use the plus sign between each number." Move all of the counters down to the large box. Model counting all of them. "1-2-3-4-5-6. Sally ate 6 total cookies." At this point model writing the last part of the problem. <u>Say:</u> "When we want to show our answer, we can use the equals sign to tell people the two sides have the same amount."	Model using student's form of communication. For example: AAC, Braille, signing. <i>I, put, all, some, same, different</i>	The main goal of this lesson is to teach the student how to transform the concrete representation of the problem into the number form. This may be done through matching or eventually writing the problem. Even if the student is not able to write clear numbers, opportunities should be given at this point to develop the skill of mark making. Encourage them to "write" the problems by providing pencils, markers, crayons, etc. modified as necessary so they can hold the implement. Work with your OT as necessary.

<p>Adding 2 three times is the same as 6. $2 + 2 + 2 = 6$."</p> <p>Show the matching equation.</p> <p>Model at least 2 more times with 2 different problems.</p>		
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Select one of the word problems provided or make/use one of your own.</p> <p>Present the problem and the counters/mat to the student.</p> <p>State the question in the problem.</p> <p>Present 3 different options for equations.</p> <p><u>Say:</u> "Point to the equation that matches the problem."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, same, you</i></p>	
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>Students should place the correct number of counters into the boxes as described in the problem.</p> <p>Once they have completed the first step to represent the problem, they should combine all of the counters into the bottom box. This process demonstrates their understanding of making small sets to show the problem set-up and then combining to find an answer. The student should then find an equation that matches their work.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this as an opportunity to observe and record the student's responses.</p> <p>Students may use eye gaze, peer-assisted scanning or verbal/AAC to guide an adult.</p>

<p>*Note: They may still not be counting the total independently and telling you the answer.</p>		
APPLY		
<p>Students describe what was done.</p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "It same." "I do."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Why</p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "You made an equation that is the same. Great job!"</p> <p>If the student is not correct, re-teach/model using the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, make, same</p>	
<p>Make explicit what the students were thinking and doing</p> <p>Describe what you saw the student do.</p> <p>Example: "You counted. You looked for the same numbers and equation."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, make, same</p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p>Formative Assessment (option)</p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Represent Subtraction with Equations



Purposes

Students will be able to match a subtraction equation with sets that model that equation.

- **M.EE.A-CED.1** Create an equation involving one operation with one variable, and use it to solve a real-world problem.
- **M.EE.A-CED.2-4** Solve one-step inequalities.
- **M.EE.A-SSE.1** Identify an algebraic expression involving one arithmetic operation to represent a real-world problem.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction
 - **Educator Resource Page IE | DLM**
 - https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Counting cubes, subtraction number sentences
- **Basic Facts Worksheet Generator** (use to create your number sentences):
<https://www.mathfactcafe.com/Worksheet/BuildIt>
- Whiteboard and markers or number sentences on individual cards
- <https://shared.tarheelreader.org/shared/read/subtraction-2>
- **Part Part Whole** or other graphic organizer of your choice:
http://www.eduplace.com/state/pdf/hmm/trb/1/1_03.pdf
- **Types of Addition and Subtraction Problems Samples use whole numbers:**
<http://www.homeofbob.com/math/numVluOp/wholeNum/addSub/adSubTypsChrt.html>

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
Activate prior knowledge or build new knowledge Complete a shared reading activity using the provided Tar Heel Reader link in the notes. Comments should connect to previous work in demonstrating an understanding of subtraction.	Model using student's form of communication. For example: AAC, Braille, signing. Some, more, all, in, not, put, get	https://shared.tarheelreader.org/shared/read/subtraction-2 DP: 6-8 Demonstrate the concept of subtraction

<p>You may also wish to review their skills in separating sets. See the lesson in the notes section.</p>		https://docs.google.com/document/d/1pOY6Ho4fYtobQ3InH2vk9v9QCcLZajKd8lO1L0JLUc8/edit
<p>Establish a purpose</p> <p>"Today we will learn to represent or write equations to show a subtraction problem."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Make, look</p>	
<p>Teach and model the concept</p> <p>Place the counting cubes and the Part Part Whole mat in front of the students. Allow them to interact with the materials for a few minutes.</p> <p>Using your students' interests, state a problem and model placing the cubes in the appropriate spot on the mat. For example: "Sue had 5 flowers. She gave Jim 2 flowers. How many flowers does Sue have now?"</p> <p>Model writing the problem on the whiteboard and counting the "flowers" on the mat. "I can show this with numbers and symbols. 5 flowers minus 2 flowers = 3 flowers. That matches this equation." (Show the prewritten equation.)</p> <p>Repeat with 2-3 more equations using the students' interests to create context.</p> <p><i>*If teaching subtraction problems with an unknown minuend or subtrahend, use the same routine, but model leaving either the minuend or subtrahend blank.</i></p> <p>Using your students' interests, state a problem and model placing the cubes in the appropriate spot on the mat. For example: "Sue had 5 flowers. She gave Jim some flowers. Sue now has 3 flowers. How many flowers did she give to Jim?"</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>All, some, more, not, get, here, same</p>	<p>Begin with concrete sets of items and then use pictures of sets modeling addition.</p> <p>Only use numbers to which the student can rote count and for which they have a secure understanding.</p> <p>For students with vision impairments, you may make the boundaries of the mat sections tactile.</p> <p>Encourage the students to count with you either out loud or in their heads.</p> <p>This is also an opportunity for them to practice their mark-making. They can experiment with different instruments and surfaces.</p>

Model writing the problem on the whiteboard and counting the “flowers” on the mat. “I can show this with numbers and symbols. 5 flowers minus ? flowers = 3 flowers. That matches this equation.” (Show the prewritten equation.)		
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Present the student with a problem using the examples above. Model the problem. Provide 2-3 choices for equations.</p> <p><u>Say:</u> “Which equation matches the problem?”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Some, more, not, here, get, same</i></p>	
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should select the equation that matches the problem.</p>		<p>Allow wait time for processing based on your knowledge of the student’s needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to observe and make notes about the student’s responses.</p> <p>The student may use eye gaze, peer-assisted scanning, or verbal/AAC to make their selection.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> “How do you know?”</p>	Model using student’s form of communication. For	Allow wait time based on your knowledge of the student’s needs.

<p>We are looking for the actions they went through to get the answer. Example: "It same."</p>	<p>example: AAC, Braille, signing.</p> <p>Why</p>	
<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes that equation matches the problem."</p> <p>If the student was incorrect, re-teach/model using the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You did it.</p>	
<p>Make explicit what the students were thinking and doing</p> <p>Describe what you saw the student do.</p> <p>Example: "You counted the items in the group. You took some away. You looked for the equation with the same numbers. You found the equation with the same answer."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Here, some, in, all, same</p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p>Formative Assessment (option)</p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Round Decimals to Any Place



Purposes

Students will be able to work with money values (e.g., \$2.42, \$0.67, \$5.94) and learn how to round up to the nearest dollar (e.g., \$2.42 rounds to \$3.00) or tenths place (e.g., \$0.67 rounds to \$0.70) or ones place (e.g., \$5.94 rounds to \$5.95). Students will also have experience with rounding down, but not in the context of money (e.g., 0.73 rounds to 70).

- **M.EE.N-Q.1-3** Express quantities to the appropriate precision of measurement. (perceptual subitizing)

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of materials that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- **Rounding Worksheets | Rounding Money Worksheets** (Use to generate problems to use during teaching and for practice. Write some problems on index cards for presentation or use the Whiteboard/markers.):
https://www.math-aids.com/Rounding/Rounding_Money.html
- Whiteboard/markers (to show problems)
- Real money (if this is not possible, then use pretend money that is as real looking as possibly)
- **Money Word Problems**
https://docs.google.com/document/d/1DK5g42cls95UE6KafoNd6xh5ftQNpvxr_0phn90cjKQ/edit
- Number line or number chart
- <https://estimation180.com/> (website that provides estimation practice opportunities)

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Provide students with opportunities to handle money in a school store or out in the community.</p> <p>Complete a shared reading activity from the list of books in the Notes section. Comments should be related to things they like to buy and what happens when they want to buy something.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, get, make</p>	<p>https://shared.tarheelreader.org/shared/read/understanding-money-using-money</p> <p>https://shared.tarheelreader.org/shared/read/money-matters</p> <p>https://tarheelreader.org/2014/10/01/shopping-6/</p>
<p>Establish a purpose</p> <p>"Today you will learn to round numbers. We will round numbers to the nearest dollar, nearest dime, and nearest tenth."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Some, all, same, different</p>	
<p>Teach and model the concept</p> <p>Present a money scenario to the students.</p> <p>For each scenario that you model, use the money (real or pretend). For example: "Nancy went to the mall on Saturday to buy clothes. She found a pair of shorts that cost \$4.43. About how much money should she give the cashier?" Talk about shopping and paying for things.</p> <p>Write the cost on the whiteboard and review the parts of the money number. <u>Say</u>: "We use a dollar sign at the front so people know we are talking about money. Then we have the whole dollar amount. That tells us how many and what kind of paper money we need. (Show the paper money.) This is the decimal point. It separates the paper money from the coin money. The two numbers</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, get, make, here, look, go, up, not</p>	<p>Students with vision-impairments may try some apps that help them read money such as LokTel. See Top Apps for Visually Impaired People: https://www.right-hear.com/top-apps-for-visually-impaired-people/</p> <p>In the early stages of instruction, only introduce one type of problem, for example just rounding up to the next dollar. Then introduce the other problem-types one at</p>

<p>after the decimal tell us how many and what kind of coins we should use. It is easiest if we give a bit more money than the price tag says. An easy way to do this is look at the whole dollar amount, for example the '4', and go up to the next number. Think... what comes after 4? Five comes after 4. We can round \$4.43 up to \$5." Model in a similar way 2-3 more times before moving on to the Think and Do.</p> <p><u>Say:</u> "We can also round the coins up to the nearest dime. For example: Mary paid \$0.51 for berries. About how much should Mary give the cashier? We look at the numbers after the decimal. We underline the first digit. I will underline the 5. What number comes after 5? Think... Six comes after five. In this case we are working with tenths. So fifty-one becomes sixty. We give the cashier sixty cents." Model 2-3 more times before moving onto the Think and Do.</p> <p>Present a decimal that includes tenths and hundredths. <u>Say:</u> "We can also round decimals down to the nearest tenth. We don't do this with money, because then we won't pay enough. We might round down when talking about weight or measurement. For example: I have an apple. It weighs 0.82 of a pound. What is its weight to the nearest tenth of a pound? We find the tenths place then move to the right. So in this problem '8' is in the tenths place and '2' is to the right. If that number is less than five we can round down. So 0.82 rounds down to 0.80." Model 2-3 more times before moving to the Think and Do section.</p>		<p>a time. Only ask for multiple problem types in the same session when students have demonstrated some proficiency with all kinds individually.</p>
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Show the student a money amount such as \$2.42.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	

<p><u>Say:</u> "If you were buying something that cost \$2.42, what is the closest whole dollar amount you would give the cashier?"</p> <p>Or</p> <p><u>Say:</u> "What is \$0.67 rounded to the nearest tenths?"</p> <p>Or</p> <p><u>Say:</u> "If something weighs 0.73 pounds, about how much does it weigh to the nearest tenth of a pound?"</p>	<p><i>What, look, you, do, some, all, up, not</i></p>	
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should round the number appropriately.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "It all." "I look." "Make more."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes, you gave the correct amount."</p> <p>If the student was incorrect, re-teach/model using the teaching scripts above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You did it.</i></p>	

<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: “You looked at the dollars. You counted to the next number to round up. Great job rounding!”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, up</i></p>	<p>Expand on the student’s language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

**EMERGENT SET 3
(HS Target EEs)**

Pattern Lesson Plans



Initial Precursor

Arrange Objects in Pairs



Purposes

Students will be able to begin placing objects together to make their own pattern. Once students are having success with this lesson, move on to:

- **IP: HS Order Objects**
<https://docs.google.com/document/d/1jqCGhNXIGI-50cEMJ7BdjLplm1qma-owYF4ncgtmQ8/edit>
- **M.EE.A-REI.10-12** Interpret the meaning of a point on the graph of a line. For example, on a graph of pizza purchases, trace the graph to a point and tell the number of pizzas purchased and the total cost of the pizzas
- **M.EE.F-BF.1** Select the appropriate graphical representation (first quadrant) given a situation involving constant rate of change.
- **M.EE.F-IF.1-3** Use the concept of function to solve problems.
- **M.EE.F-IF.4-6** Construct graphs that represent linear functions with different rates of change and interpret which is faster/slower, higher/lower, etc.
- **M.EE.F-LE.1-3** Model a simple linear function such as $y=mx$ to show that these functions increase by equal amounts over equal intervals.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- Mixed groups of items that can be put into groups:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Pattern blocks of various kinds, either concrete or virtual
<https://apps.mathlearningcenter.org/pattern-shapes/>
- **PAIR vocabulary card:**
https://docs.google.com/document/d/14JHLQTRXcuJdygCwNnQpn1By6liZkPlwHluFSM8_ktU/edit

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Complete shared reading activity to introduce things that go together and could be used to make patterns.</p> <p>“What other things go together?”</p> <p>The class could take a trip around the classroom finding things that go together - desk and chair, pencil and notebook, etc.</p>	<p>Model using the student’s form of communication.</p> <p>Same, put, different</p>	<p>https://shared.tarheelreader.org/shared/read/what-goes-together</p>
<p>Establish a purpose</p> <p>“Today we will be putting objects in pairs.”</p> <p>Use the PAIR Vocabulary card.</p>	<p>Model using the student’s form of communication.</p> <p>Put</p>	
<p>Teach and model the concept</p> <p>“A pair is a set of two things that go together like shoes and socks. We can make pairs with other things too.”</p> <p>Model putting the pattern blocks into pairs.</p> <p>For example: “Watch me make pairs of shapes. I want to pair green triangles with orange squares. The triangles have 3 sides (Count aloud “1-2-3”) and they are green. The squares have 4 sides (Count aloud “1-2-3-4”) and are orange. First I put down a green triangle, then I put an orange square next to the green triangle to make a pair. I can make another pair. Watch. First I put down a green triangle and then I put an orange square next to it to make a pair.”</p>	<p>Model using the student’s form of communication.</p> <p>Go, same, make, I, look</p>	<p>If the pattern blocks are too abstract for your student, consider using items such as silverware, pencils and notebooks, cheese and crackers, etc. The same routine can be applied.</p> <p>When using the concrete pattern blocks you may want to begin with the shapes already sorted into a pile of triangles and a pile of squares. Once the students get the rhythm of moving from one pile to the other, you can mix the shapes so they need</p>

		to sort then make a pair.
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Provide the student with two piles of different shapes. Describe them to the student or ask, “What do you see?”</p> <p>Then direct the student to make pairs of the shapes, for example: “Make a pair of blue and white shapes.”</p>	<p>Model using the student’s form of communication.</p> <p><i>Go, same, make, I, look</i></p>	<p>Provide wait time appropriate for that student.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should make the appropriate pairing.</p>		<p>Students with physical limitations may use eye gaze, a pushing stick, or verbal/AAC to direct an adult.</p> <p>Students with vision impairments - pairings should be based on shape and/or size to allow them to feel and then make a decision.</p> <p>Allow ample wait time based on the student’s processing needs.</p> <p>There should be no adult coaching at this time. Prompts to continue and repeating of directions may be provided.</p> <p>This is a time to observe the student’s responses and make notes.</p> <p>If there is no response by the student, use this as an opportunity to work on joint</p>

		attention and engagement through the use of light, sound, movement and touch.
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Say:</u> “Tell me what you did.”</p>	<p>Model using the student’s form of communication.</p> <p><i>What you, do</i></p>	<p>Provide ample wait time based on student’s processing needs.</p>
<p><i>Get feedback</i></p> <p>Provide feedback.</p> <p>If the student was correct, acknowledge their work and move on to the next step.</p> <p>For example: “You made pairs with the shapes. You matched up the shapes. Great job making pairs!”</p> <p>If the student was incorrect, re-teach using the original teaching script as a guide. See above.</p>	<p>Model using the student’s form of communication.</p> <p><i>You, make, same, here</i></p>	<p>Bring attention to the thinking process more than the correctness of answer in the beginning. Try to look for connections that the student understands the concept.</p> <p>If there is no response by the student, use this as an opportunity to work on joint attention and engagement through the use of light, sound, movement and touch.</p>
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student’s thinking process went, expanding on their description of the process. Model the correct language.</p> <p>For example: “You looked at each set of shapes. You chose the shape that went first, then you chose the shape to make a pair. You knew that a pair was a set of two. Great job thinking!”</p>	<p>Model using the student’s form of communication.</p> <p><i>You, look, make, here</i></p>	
<p><i>Formative Assessment</i></p> <p>___ Did not attend/no response</p>		

- ☐ Attended/no response
- ☐ Attended/response incorrect
- ☐ Attended/response partially correct
- ☐ Attended/response fully correct

Purposes

Students will be able to begin placing like objects together based on the characteristics that make an item the same or different than another.

- **M.EE.F-BF.2** Determine an arithmetic sequence with whole numbers when provided a recursive rule.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- Mixed groups of items that can be classified:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: An assortment of writing utensils (pencils, crayons, markers, pens, colored pencils, highlighters); there should be multiples of each kind. In the early stages, limit the number of classes or kinds to just 2 then add in more as the student becomes more proficient.
- Visual/physical organizer to assist students with organizing their items into like groups
- **For more activities related to early patterning skills** (you will need to make a free account to access the information and activity ideas):
https://learningtrajectories.org/index.php/learning_trajectories/get_trajectory_detail/s/11

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
Activate prior knowledge or build new knowledge Complete a shared reading activity with the book provided. Comments during reading should relate to the foods - their attributes, other examples, student's likes and dislikes.	Model using the student's form of communication. You, like, same, different	https://shared.tarheelreader.org/shared/read/the-edible-pyramid

<p><i>Establish a purpose</i></p> <p>"Today we will classify things by looking at their attributes. We will put things in groups by looking at them to see how they are the same and different."</p>	<p>Model using the student's form of communication.</p> <p><i>Look, same, different, put, in</i></p>	
<p><i>Teach and model the concept</i></p> <p>"Classify means to put in groups based on characteristics. We can look at color, shape, size, use, or texture."</p> <p>Place the writing utensils in front of the student. Allow them to interact with the items and describe the different types. Provide paper and whiteboards and encourage the students to practice their mark making.</p> <p>For example: "Here is a pencil. It is made of wood. It is yellow and has an eraser." Repeat for each kind of writing implement.</p> <p>Show the visual organizer. Label the top of one column "writing" and the other column "drawing."</p> <p><u>Say:</u> "We are going to classify these items. We will sort them based on how we use them. We use some of them for writing a letter. We will put them in this group (point to the writing column). We use some of them for drawing or coloring. We will put them in this group (point to the drawing column)."</p> <p>Model selecting an item and talking about how it is used, then placing it in the appropriate column.</p> <p>Repeat for the remaining items.</p>	<p>Model using the student's form of communication.</p> <p><i>Look, same, different, put, in, here, it</i></p>	
<p>THINK AND DO</p>		
<p><i>Students think about what to do:</i></p> <p>Place a new mix of writing utensils in front of the student.</p>	<p>Model using the student's form of communication.</p> <p><i>Here, put, in, do</i></p>	<p>Provide wait time appropriate for that student based on the student's processing needs.</p>

<p><u>Say:</u> “Here are some items for you to classify. If we usually write with them, put them in the writing column. If we usually draw or color with them, put them in the drawing column.”</p>		
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should place items in each column.</p>		<p>There should be no adult coaching at this time.</p> <p>Use this time to observe the student’s responses and make notes.</p> <p>You may repeat directions and provide prompting to complete the task if necessary.</p> <p>If the student has physical limitations, eye gaze, a pushing stick, or verbal/AAC may be used to direct an adult.</p> <p>Students with visual impairments should be able to hold each item before classifying it.</p> <p>This is an opportunity to work on joint attention and engagement through the use of light, sound, touch, and movement.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Say:</u> “Tell me what you did.”</p>	<p>Model using the student’s form of communication.</p>	<p>Allow wait time based on the student’s processing needs.</p>

<p>The student may say things like: "I look." "I put." "It same." "It different."</p>	<p><i>What, you, do</i></p>	
<p><i>Get feedback</i> Provide feedback. (See notes.)</p> <p>If the student is correct, acknowledge their work and move on to the next step.</p> <p>For example: "I see you put all of the items that you write with in the writing column. I see you put all of the items that you draw with in the drawing column. Great job classifying."</p> <p>If the student is incorrect, address the errors by re-teaching the criteria by which the items were to be classified as was done in the teaching phase above. Also see notes column for special situations.</p>	<p>Model using the student's form of communication.</p> <p><i>I, see, you, put, here, in</i></p>	<p>Bring attention to the thinking process more than the correctness of answer in the beginning. Try to look for connections showing that the student understands the concept. Keep in mind that for some students they may write with a marker because it is easier to hold. It is more important that there seems to be a reason specific to that student for why each item was placed where it was. Talk through each item briefly about why it might be in that column. Be flexible in your thinking.</p>
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student's thinking process went, expanding on their description of the process. Model the correct language.</p> <p>For example: "I saw you look at each item and touch it. You then paused as you thought about where to put each item based on how you used it. Great job classifying!"</p>	<p>Model using the student's form of communication.</p> <p><i>I, see, you, put, here, in</i></p>	
<p><i>Formative Assessment</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Purposes

The student will develop further understanding of combining (composing) things into sets. Students will also develop their ability to notice how the size of the sets changes with each combining (composing) action. Please use the vocabulary that matches your goals.

(Please note there is a shared reading component and possible science connections through the cooking activities included in this lesson plan.)

- **M.EE.A-SSE.3** Solve simple algebraic equations with one variable using multiplication and division.

Materials

- Core Vocabulary board for each student
- Number strip for each student
 - **Number line access resources:**
https://docs.google.com/document/d/1bZJQ5SHTqPr8cg84oXoz2OP07fIBOZX_YLI-j3MDISQ/edit
- Copy of Formative Assessment document for each student
- Ingredients for a recipe. **Resources can be found here:**
<https://accessiblechef.com/#backtotop>
- Items to count:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: 5 yellow counting cubes, 5 red counting cubes, 10 2-sided probability counters. (The number of yellow and red will change depending on which side is visible.)
 - **Learning Resources Two-Color Counters, Red/Yellow, Educational Counting, Sorting, Patterning, and Probability Activities, Set of 200, Grades K+, Ages 5+**
<https://www.amazon.com/Learning-Resources-Color-Counters-Yellow/dp/B0017D9BDG>
- **Sorting mat:**
<https://docs.google.com/document/d/1IDd44XVFjhwukHKCRcKczWT58vN9Asfz4-fobhEdWiE/edit>
- **Combine/compose vocab card:**
https://docs.google.com/document/d/19wGXuWxViK5LPEHTO5n_QO_lhNFUjOJEoz68sRPP5I/edit
- Chart paper and markers

(Students should have opportunities to sort and combine real life items as well. Items could include, but are not limited to: books, snack items, games, articles of clothing, etc.)

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Begin with a shared reading activity (see notes for an option)</p> <p>Cooking activities lend themselves to understanding “combining.”</p> <p>Select a fun recipe to make during class and talk about combining the ingredients.</p>	<p>Model using student’s form of communication.</p> <p><i>I, you, put, here, in, some, all, more, not more, up, that, in</i></p>	<p>Shared reading activity: https://shared.tarheelreader.org/shared/read/your-waffles-ready</p> <p>While cooking, use terms to describe the attributes of each of the items. Include color, texture, smell, quantity, etc. These kinds of activities work well for engaging students and improving joint attention. While cooking, use sight, sound (music), movement, and touch to encourage engagement and attention.</p>
<p>Establish a purpose</p> <p><u>Say:</u> “We will be “combining” or “composing” smaller sets or groups of items into bigger things like we took the ingredients we had and made ____.”</p>	<p>Model using student’s form of communication.</p> <p><i>Put, more</i></p>	
<p>Teach and model the concept</p> <p><u>Say:</u> “When we put things together we “combine” them or “compose” them.”</p> <p>Place 5 red counting cubes and 5 yellow counting cubes on the table in clearly marked</p>	<p>Model using student’s form of communication.</p> <p><i>Put, more, not more, here</i></p>	

<p>sets. Use the sorting mat listed above as needed.</p> <p><u>Say:</u> “There are 2 sets of cubes. One set is yellow. 1-2-3-4-5 yellow cubes. One set is red. 1-2-3-4-5 red cubes. I can combine them into one set because they are all cubes. 1-2-3-4-5-6-7-8-9-10 cubes all together. I started with two small sets. Then I combined them. I now have one large set. When I combine sets or groups of things I make a larger set. The set then has more.”</p> <p>Repeat with at least two more variations of groupings using the cubes and the counters. Model counting and Think Aloud about how the sets changed in size when they were combined.</p>		
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place two sets of items in front of the student. For example a set of 3 red counters and a set of 2 yellow counters.</p> <p>Ask the student to count the items in each set. Possibly provide assistance by counting out loud while you ask the student to count in their head and demonstrate 1:1 correspondence.</p> <p>Ask the student to combine (compose) the two sets.</p> <p>Ask the student which was larger, one of the first sets or the final set.</p>	<p>Model using student’s form of communication.</p> <p><i>Put, you, it, here, in</i></p>	<p>Provide ample wait time based on your knowledge of the student’s processing needs.</p> <p>Students with physical limitations can use eye gaze, a stick to help move items, or use verbal/AAC directions such as <i>“put here”</i> or <i>“put in.”</i></p> <p>It may be helpful to take pictures or draw what the student did to help them compare from their first set to the final combined set. You may have a second set of materials that stays in its original state so the student can more easily make a comparison.</p>

<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>Student should count each set and then combine and count the large set</p> <p><i>*As the student makes the sets, either draw each result or have another identical set of items for comparison during the feedback stage.</i></p>		<p>Other than assistance with counting, (the focus is on combining at this point rather than counting skills) or prompts to complete the task, there should be no adult coaching at this time.</p> <p>If the student has physical limitations, please see notes above for possible modifications.</p> <p>Provide ample wait time based on your knowledge of the student's processing needs.</p> <p>If the student does not engage with the materials, work on joint attention and engagement by using sight, sound, light, touch, and movement to gain the student's attention and encourage exploration of the materials.</p>
<p>APPLY</p>		
<p>Students describe what was done.</p> <p><u>Say:</u> "Tell me what you did."</p> <p>Example: "I counted." "I put together."</p>	<p>Model using student's form of communication.</p> <p><i>I, put</i></p>	
<p>Get feedback</p> <p>Using another set identical to the student's set or a drawing, compare the student's result to how it should look.</p>	<p>Model using student's form of communication.</p>	<p>Ask the student to count in their head as you count.</p>

Ask: "Which had more?"	More, not more, here, it	
<i>Make explicit what the students were thinking and doing</i> Expand on their thinking processes. Make it "visible." "You first counted each set (model counting) and then you put them all together because you knew combine (compose) means to put them together. Then you counted all of them. Great job combining!"	Model using student's form of communication. <i>You, put, here, it, some, more</i>	Ask the student to count in their head as you count.
<i>Formative Assessment (option)</i> ___ Did not attend/no response ___ Attended/no response ___ Attended/response incorrect ___ Attended/response partially correct ___ Attended/response fully correct		

Contrast Objects



Purposes

Students will develop their ability to identify which object is different from other objects. Students will begin to understand what characteristics make that object different from the other object

- **M.EE.F-BF.2** Determine an arithmetic sequence with whole numbers when provided a recursive rule.

Materials

- Copy of Core Vocabulary Board for each student
- Copy of Formative Assessment for each student
- List of materials that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
 - For this example lesson: Pattern blocks concrete or virtual
 - **Pattern Shapes by the Math Learning Center**
<https://apps.mathlearningcenter.org/pattern-shapes/>
- **More activities/information regarding contrasting objects and patterns:**
https://learningtrajectories.org/index.php/learning_trajectories/get_trajectory_details/3

(*Note: While this lesson is written using pattern blocks, it is recommended that other objects/pictures be used to provide repetition with variety such as counting blocks, pictures of animals, letter and number cards, etc.)

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
Activate prior knowledge or build new knowledge In a small group compare and contrast the clothes everyone is wearing. Practice using "same" and "different" when comparing a two students' shoes or their shirt. Ask them to think in their heads about how the items are the	Model using the student's form of communication. Same, different	If there are students with vision impairments, use examples that can be distinguished by touch or sound such as the texture of shirt sleeves or the sounds of

same or different. Have a few students share their ideas.		shoes being stomped on the floor.
<p><i>Establish a purpose</i></p> <p>“Today we will learn how to find an object that is different and tell why it is different from other objects.”</p>	<p>Model using the student’s form of communication.</p> <p><i>Look, different, why</i></p>	
<p><i>Teach and model the concept</i></p> <p><u>Say:</u> “When we work with patterns, we need to be able to tell what is different in the pattern.”</p> <p>Place 3 pattern blocks (two are the same and one is different) in front of the student. Model noticing their attributes.</p> <p>For example: “Here is a green triangle. I can count the sides 1-2-3. Here is an orange square. I can count the sides 1-2-3-4. Here is another green triangle. It also has 3 sides, 1-2-3. This shape (triangle) and this shape (triangle) are the same. They are both the same color and have 3 sides. This shape (square) is a different color and has more sides.”</p> <p>Model with other groups of shapes.</p>	<p>Model using the student’s form of communication.</p> <p><i>Look, different, why</i></p>	<p>For students with visual impairments, focus on the attributes that can be felt like shape, relative size, and number of sides.</p> <p>If the student has difficulty with joint attention or engagement use sight, sound, touch, and movement to make things interesting and gain attention as you are modeling.</p>
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place a group of 3 objects (2 are the same and 1 is different) in front of the student. Encourage him/her to interact with the items.</p> <p><u>Ask:</u> “What do you notice?” Or “What do you see?” Or “What do you feel?”</p> <p>Then place the items in a row. <u>Ask:</u></p> <ul style="list-style-type: none"> ● “Which one is different?” ● “How is it different?” 	<p>Model using the student’s form of communication.</p> <p><i>Look, you, what different</i></p>	<p>Provide wait time appropriate for that student.</p> <p>There should be no adult coaching at this time. This is an opportunity to observe the student’s responses and make notes.</p> <p>If the student does not respond, use this as another opportunity</p>

On successive repetitions, you may use the same shapes and mix up the order or change up the shapes that are used.		to work on joint attention and engagement through the use of light, sound, movement, and touch.
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should interact with the shapes and respond to your questions.</p>		<p>Provide wait time appropriate for that student.</p> <p>There should be no adult coaching at this time. This is an opportunity to observe the student's responses and make notes.</p> <p>If the student does not respond, use this as another opportunity to work on joint attention and engagement through the use of light, sound, movement, and touch.</p> <p>Make sure students with visual impairments interact with the objects. If a student has physical limitations, the adult can assist with interacting. The student may respond via eye gaze, using a pushing stick or use verbal/AAC to direct an adult.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><i>"Tell me what you noticed." or "Why did you choose that one?"</i></p>	Model using the student's form of communication.	Try to attribute meaning to every communication attempt by looking at

<p>The student may respond with: “More” “Same” “Not more” “Different”</p>	<p><i>You, do, why</i></p>	<p>the item the student is holding and comment about the attributes you see. Use your knowledge of your student’s communication to expand on their comments.</p>
<p><i>Get feedback</i></p> <p>Provide feedback.</p> <p>If the student is correct, acknowledge their correctness and move on to the next step. For example: “You are correct. That one is different because it has 4 sides.”</p> <p>If the student is incorrect, compare the shapes again as you did in the teaching step. Encourage the student to interact with the shapes as you model the descriptions.</p>	<p>Model using the student’s form of communication.</p> <p><i>You, different</i></p>	<p>If the student does not respond, use this as another opportunity to work on joint attention and engagement through the use of light, sound, movement, and touch.</p>
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student’s thinking process went, expanding on their description of the process. Model the correct language.</p> <p>For example: “We can count the sides and look at the color to tell which is different. These two are green and have 3 sides (1-2-3) and this one is orange and has 4 sides (1-2-3-4). It is different from those. Green and orange are different colors. 3 and 4 are different amounts.”</p>	<p>Model using the student’s form of communication.</p> <p><i>Same, different, more, not more, here, on, it</i></p>	
<p><i>Formative Assessment</i></p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Purposes

The student will be able to put objects in the same order as a model. At this level, ordering opportunities should include ordering from smallest to largest, heaviest to lightest, etc. Students should already be familiar with the lesson:

- **IP: HS Arrange Objects in Pairs.**
https://docs.google.com/document/d/1nS1BEmmFIKfowdIcJ0CcPRSnbP9l68f9-42wIH_LX58/edit
- **M.EE.A-REI.10-12** Interpret the meaning of a point on the graph of a line. For example, on a graph of pizza purchases, trace the graph to a point and tell the number of pizzas purchased and the total cost of the pizzas
- **M.EE.F-BF.1** Select the appropriate graphical representation (first quadrant) given a situation involving constant rate of change.
- **M.EE.F-BF.2** Determine an arithmetic sequence with whole numbers when provided a recursive rule.
- **M.EE.F-IF.1-3** Use the concept of function to solve problems.
- **M.EE.F-LE.1-3** Model a simple linear function such as $y=mx$ to show that these functions increase by equal amounts over equal intervals.

Materials

- Copy of Core Vocabulary board for each student
- Copy of the Formative Assessment for each student
- Items to put in order. Ideas can be found here:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Variety of pattern blocks, either concrete or virtual. You will need at least 3 different shapes with at least 1 extra of each shape.
<https://apps.mathlearningcenter.org/pattern-shapes/>

(*Note: This lesson can also be done with sound/music/tones.

<https://experiments.withgoogle.com/collection/creatability>)

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Make connections to the daily schedule. Review the visual schedule and ask the student what activity will be next based on the schedule.</p>	<p>Model using the student's form of communication.</p> <p>Look, what, when, do</p>	
<p>Establish a purpose</p> <p>"Today we will learn to put things in order. We will use a model to help us."</p>	<p>Model using the student's form of communication.</p> <p>Put</p>	
<p>Teach and model the concept</p> <p>Place 3 different shapes in front of the student. Allow the student to interact with the shapes. Talk about the attributes of each shape.</p> <p>Put the three shapes in an order. For example - green triangle, orange square, yellow hexagon.</p> <p><u>Say:</u> "I will use this model (point to the shapes) to make another set just like it. I will put the shapes in the same order as the model."</p> <p>Begin placing the second set of shapes one at a time right after the model. Place the green triangle right after the yellow hexagon, then the orange square, and finally the yellow hexagon.</p> <p>While you are placing the shapes refer to the model by pointing and naming the shape.</p> <p><u>Say:</u> "First I need a green triangle to match the first shape. I will put it right after the yellow hexagon." (Move to the next shape in the model.) "Next I see an orange square, so I need to find one of those. Here is an orange square. I will put it right after the green triangle just like the model." (Move to the next shape in the model.) "Next I see a yellow hexagon. I need to find another one to put</p>	<p>Model using the student's form of communication.</p> <p>Put, look, here, it, same, different</p>	<p>This is an opportunity to work on joint attention and engagement through the use of sound, light, touch and movement.</p> <p>Ensure that students with vision impairments have an opportunity to feel the shapes as you discuss them and place them in a pattern.</p> <p>In future lessons, begin to include other attributes such as size, weight, and amount to put things in order.</p>

<p>after my orange square. Here is another yellow hexagon. I will put it at the end."</p> <p>Model at least two other patterns using a similar script.</p>		
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place 3 different shapes in front of the student along with the piles of extra shapes. Allow the student to interact with the items and talk about their attributes.</p> <p><u>Say:</u> "Here is a model of a pattern. Here are some extra shapes. Put them in the same order as the model. Put the first one here." (Point to the space right after the last shape in the model.)</p>	<p>Model using the student's form of communication.</p> <p><i>Put, here, same</i></p>	<p>Provide ample wait time appropriate for that student based on their processing needs.</p> <p>For students with visual impairments, make sure the shapes used are dissimilar enough to be distinguishable by touch alone.</p> <p>As the student becomes more accurate, increase the extras pile size and/or include distractor shapes.</p> <p>Another option is to place the shapes already in order so the student just chooses them one at a time. Once they can do this, then mix up the order of the extra shapes.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer 		<p>Provide ample wait time based on the student's processing needs.</p> <p>There should be no adult coaching at this time. Use this as an opportunity to</p>

<p>The student should select the appropriate shapes to copy the model, placing them just after the model pattern.</p>		<p>observe the student's response and make notes.</p> <p>You may provide prompts and repeat the directions.</p> <p>If the student does not respond, use this as an opportunity to improve joint attention and engagement through the use of light, sound, touch, and movement.</p> <p>Students with physical limitations may need assistance moving the shapes. Eye gaze, a pushing stick, and/or verbal/AAC direction to an adult may help.</p>
<p>APPLY</p>		
<p><i>Students describe what was done.</i></p> <p><u>Say:</u> "Tell me what you did."</p> <p>The student may respond with: "I look." "I put same." "I put here."</p>	<p>Model using the student's form of communication.</p> <p><i>You, do</i></p>	<p>Provide ample wait time based on the student's processing needs.</p>
<p><i>Get feedback</i></p> <p>Provide feedback.</p> <p>If the student is correct, then acknowledge their work and move on to the next step. For example: "You made the same pattern. You put them in order. Great thinking!"</p> <p>If the student was not correct, move through each shape and ask "Same or different?" while referring to the model and the shape the student placed. Talk about the attributes that</p>	<p>Model using the student's form of communication.</p> <p><i>You, make, same, different</i></p>	<p>If the student did not respond, this is another opportunity to model and work on joint attention and engagement through the use of sound, light, touch, and movement.</p>

might be the same as well as what makes it different.		
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student's thinking process went, expanding on their description of the process. Model the correct language.</p> <p>For example: "I saw you look at the model. You were looking for the extra shape that was the same. You looked at its color and shape. You decided it was the same so you put it in the pattern. Great thinking!"</p>	<p>Model using the student's form of communication.</p> <p><i>You, look, same, put</i></p>	
<p><i>Formative Assessment</i></p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Distal Precursor

Recognize Sequence



Purposes

Students will be able to recognize symbolic (letter and number) patterns. This also requires that students recognize numerals in order. (i.e., 1, 2, 3...).

- **M.EE.F-BF.2** Determine an arithmetic sequence with whole numbers when provided a recursive rule.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of materials that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson:
 - <https://www.random.org/sequences/>
 - <https://randomwordgenerator.com/letter.php>
 - These generators can be used to generate your random sequences.
- **Yes/No Response Card:**
<https://docs.google.com/document/d/11JdXsPRBXrtBoRNkxA3aM7U-bkJab0gzUFe-crATHw/edit>

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Present several non-symbolic (use shapes, pictures, items) patterns and non-patterns.</p> <p>The students can point to or hold up their Yes/No cards to communicate if it is a pattern or not.</p> <p>Review the characteristics of a pattern. It is regular and is repeated. You can predict what will come next.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Look</p>	

<p>You may also wish to review the count sequence orally through a rote counting drill.</p>		
<p><i>Establish a purpose</i></p> <p>“Today you will learn to recognize a symbolic pattern when numbers or letters are used.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Look</i></p>	
<p><i>Teach and model the concept</i></p> <p><u>Say:</u> “We count numbers in a sequence. When we count, we say each number in order. For example 1-2-3-4-5.” Show the sequence on the whiteboard or highlight it on a number line/chart. Encourage the students to count with you.</p> <p><u>Say:</u> “Just like we learned with other patterns, we must be able to predict what number comes next. I know when I count by ones that 6 comes after 5.” (Refer to the written sequence above.)</p> <p><u>Say:</u> “Sometimes numbers are put in a random sequence. We can’t predict which number comes next. For example : 9, 4, 6, 2, 8, 3. The numbers are not in any order. I can’t tell which number comes next.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Go, here, finished</i></p>	<p>Start with numbers as the students should already have some proficiency with rote counting.</p> <p>Once students can rote count and recognize the simple counting sequence, begin to add other sequences like recognizing counting by 2s, 5s, and 10s.</p> <p>They may need to use a number line or chart to help with the recognition of the pattern.</p> <p>Letter sequences can come later or whenever students have learned to spell some simple words.</p> <p>Word recognition would indicate their knowledge recognizing letter sequences.</p>

THINK AND DO

Students think about what to do:

Present the regular counting sequence and then at least one random sequence.

Say: **"Show me the counting sequence pattern."**

Model using student's form of communication. For example: AAC, Braille, signing.

You, look, here

Remember to start the sequence at numbers other than 'one.'

Keep in mind the counting abilities of the student.

Present the sequences in braille, other tactile options or verbally to students with vision-impairments.

Once the student can recognize the regular counting sequence then begin to add in the skip counting sequences and finally the sequences that might appear in a ratio table.

Students do:

- Solve the problem
- Build the model
- Find the matching shapes
- Put them in order
- Interpret the data, etc.
- Describe/share answer

The student should indicate the counting sequence.

Allow wait time for processing based on your knowledge of the student's needs.

There should be no adult coaching at this time, other than prompts to respond or to work.

Use this time to observe and record notes about the student's responses.

The student may use eye gaze, peer-assisted scanning, or

		verbal/AAC to direct an adult.
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "It same." "It goes here."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes, that is how we count."</p> <p>If the student is incorrect, re-teach/model using the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You did it.</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: "You looked for the sequence that had the numbers in order. You could predict what number comes next."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, look</i></p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Recognize Symbolic Patterns



Purposes

Students will be able to distinguish between a pattern and a random string of symbols.

- **M.EE.F-BF.2** Determine an arithmetic sequence with whole numbers when provided a recursive rule.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
 - For this example lesson:
 - **Multi colored square counting tiles:**
https://www.eaieducation.com/Product/503472/Color_Tiles_Plastic_-_Set_of_40.aspx?&gclid=EALalQobChMI7JqHjOWY6wIVhOF3Ch1TUQeAEAQYAYABEgKYuPD_BwE&&gclid=EALalQobChMI7JqHjOWY6wIVhOF3Ch1TUQeAEAQYAYABEgKYuPD_BwE
 - Or pattern blocks
 - Concrete
https://www.amazon.com/Learning-Resources-Plastic-Pattern-Blocks/dp/B00004WKPP/ref=asc_df_B00004WKPP/?tag=hyprod-20&linkCode=df0&hvadid=167150204809&hvpos=&hvnetw=g&hvrnd=982553642365825116&hvpone=&hvpstwo=&hvmmt=&hvdev=c&hvdvcmidl=&hvlloci nt=&hvllocphy=9017921&hvtargid=pla-308215898282&pssc=1
 - Or virtual (**Pattern Shapes by the Math Learning Center**)
<https://apps.mathlearningcenter.org/pattern-shapes/>
 - <https://docs.google.com/document/d/11JdXsPRBXrtBoRNkxA3aM7U-bkJab0gzUFe-crATHw/edit>
 - **Jack Hartmann “Pump Up the Pattern” Video**
<https://www.youtube.com/watch?v=hoFhVdYsmPg>

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Select the video to view or the Tar Heel reader book from above.</p> <p>Complete a shared reading activity with the book. Comments should be about how the events happen repeatedly and in the same order. Elicit which times of day or seasons the student's like most. Talk about the activities that can be done during those times.</p> <p>You may also review a routine that the students know very well, such as hand-washing or morning routine. Ask the students to recite or act out the routine.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	<p>The Jack Hartmann video is a great opportunity to get the students moving and feel patterns. Even those who have physical limitations can participate as fully as they can.</p> <p>Collaborate with your OT/PT on specific ways your student can participate.</p>
<p>Establish a purpose</p> <p>"Today we will learn to recognize patterns."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	
<p>Teach and model the concept</p> <p>Place the tiles or the blocks in front of the students. Allow them to interact with the materials for a few minutes. Talk about the attributes of the materials such as shape and color. Encourage them to sort and arrange them in different ways.</p> <p>When you are ready, gather the tiles or blocks,</p> <p><u>Say:</u> "We learned about some patterns in the ____ (book we read/video we watched). Patterns are all around us. When we know a pattern or a routine, it makes us feel safe and smart. When we know the pattern, we know what comes next if something is missing. We can also make patterns with blocks, words, symbols, numbers, and</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Make, same, different, some, all, not, put</p>	<p>Once you have taught them what a pattern is, provide multiple opportunities for students to find patterns in the environment. Examples to look for include: carpet or tile patterns, room number patterns, desk/chair arrangements, bulletin board frames, etc. Come up with a signal the students could use to indicate they have found a pattern.</p>

<p>pictures. Watch me make a pattern with these blocks."</p> <p>Make a simple AB pattern. "One kind of pattern I can make is to just alternate two different things. It is called an AB pattern. Square, triangle, square, triangle, square, triangle. I know it is a pattern because I use the same shapes over and over again. I can predict which shape comes next and continue the pattern."</p> <p>Give the students the same shapes. "Now your turn. You make the same pattern I made."</p> <p>Next make a row of random shapes. There should be no pattern present. "This is not a pattern. None of the shapes repeat in an organized or predictable way. I don't know which shape to put next."</p> <p>Give the students those same shapes. "Make a line of shapes like mine. See how they don't repeat? This is not a pattern."</p> <p>Repeat the modeling 2-3 more times.</p>	<p>If you have a student with a vision impairment, the concrete pattern blocks will work the best for this lesson. For the active participation, students may use eye gaze, a pushing stick, or verbal/AAC to direct an adult.</p> <p>A template showing the pattern may be helpful here as well.</p> <p>You may provide as much or as little help is needed here. The goal is to get them actively participating and begin to understand the repetitive nature of the pattern through kinesthetic input.</p> <p>In future lessons, use other materials such as letters, numbers, symbols, food items, toys, etc. Repetition with variety. Use the same script, just replace the tiles/pattern blocks with another item as listed above.</p> <p>Music is another place patterns occur. Explore this website Creatability (https://experiments.w ithgoogle.com/collecti on/creatability) and/or</p>
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		<p>work with your music teacher to collect samples of music that have distinct patterns. The students can hold up the response card to indicate whether or not they hear a pattern.</p> <p>Once they have the AB pattern understood, move on to directly teaching the remaining patterns (AABB, ABC, ABCD, etc.).</p>
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place two lines of tiles/pattern blocks in front of the student. One should be a clear pattern and one should be a random line of tiles/pattern blocks.</p> <p><u>Say:</u> "Show me the pattern."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You do</i></p>	
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should indicate the pattern.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Use this time to make observations and record the student's responses.</p> <p>The student may use eye-gaze or</p>

		<p>peer-assisted scanning to select their answer.</p> <p>Students who have vision impairments should have the opportunity to explore the pattern. The pieces may need to be secured by glue or velcro to ensure consistency.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "I look."</p> <p>"Same, not same, same, not same."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes, that is a pattern."</p> <p>If the student is not correct, re-teach/model using the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You did it.</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: "You looked. You saw that the blocks repeated."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, look, same, different</i></p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

**EMERGENT SET 3
(HS Target EEs)**

Set/Separateness Lesson Plans

Initial Precursor

Purposes

The student will be able to recognize that two or more sets or groups of items exist. students recognize when items are grouped together into a set or separated out.

- **M.EE.N-CN.2.a** Use the commutative, associative, and distribute properties to add, subtract, and multiply whole numbers.
- **M.EE.N-CN.2.b** Solve real-world problems involving addition and subtraction of decimals and whole numbers, using models when needed.
- **M.EE.N-CN.2.c** Solve real-world problems involving multiplication of decimals and whole numbers, using models when needed.

Materials

- Familiar items that come in sets (bundled together) and separate (loose):
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: 2 identical boxes of colored pencils (1 set will stay in the box, the other set will be out of the box)
- CORE vocabulary board and/or AAC device for each student
- Copy of Formative Assessment for each student

*(*Note: This lesson routine can also be used with items that may be used to meet post-secondary goals. For example, making sets of utensils wrapped in a napkin for a restaurant or sorting parts into bags for a manufacturer. Get creative!)*

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
Activate prior knowledge or build new knowledge Go on a Treasure Hunt to find items that are in a container and similar items that are loose. (You may need to set this up.) As you and the students find things that are in a container and loose start to use the words set and separate.	Model using Core board or AAC device. In, not, here, put	This is an opportunity to have some fun using light, sound/music, movement, and touch to work on joint attention and engagement. Move about the room in different ways. Use

<p>"I found a set of crayons. Some are already in the box, but some fell out and are separate."</p> <p>This can be used as an opportunity to put things where they belong and share how things go together. For example: "We don't put markers in the crayon box. Markers aren't part of the crayon set. They can be used to draw like crayons, but they are different."</p>		flashlights to find things. Vary your tone of voice and body language to work on gaining responses from the students.
<p><i>Establish a purpose</i></p> <p>"We are going to learn some new words that help us describe those things that go together and those things that don't belong."</p>	<p>Model using Core board or AAC device.</p> <p><i>Some, go, not, in, same, some</i></p>	
<p><i>Teach and model the concept</i></p> <p>Using the familiar items follow the sequence below: (Example: Box of colored pencils)</p> <p>Present the box of colored pencils and <u>say</u>: "This is a set of colored pencils. They are all together in the box. The box helps them stay together. They are all used to color or draw."</p> <p>Present some colored pencils that are not in the box, but loose. Say: "These colored pencils are separate from those colored pencils. They are not in the box. They are separate."</p> <p>Point to the boxed colored pencils and <u>say</u>: "This group of colored pencils is in a set."</p> <p>Point to the loose colored pencils and <u>say</u>: "This group of colored pencils is separate."</p>	<p>Model using Core board or AAC device.</p> <p><i>All, in, some, not</i></p>	
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place the box of colored pencils and the loose colored pencils in front of the student.</p> <p>Ask student to point or indicate which is the "set."</p>	<p>Model with Core Board or AAC device.</p> <p><i>Where, in, not in</i></p>	<p>Provide ample wait time based on the student's processing needs.</p>

Ask student to point or indicate which is "separate."		
<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>Provide wait time appropriate for that student.</p> <p>Observe student.</p> <p>Student provides answer using their mode of communication.</p>	<p>Possible words they may use:</p> <p>In, not in</p> <p>Most likely student will just point or use "stop" for partner-assisted scanning</p>	<p>There is to be no adult coaching at this point in the lesson.</p> <p>Use this as an opportunity to observe the student's responses.</p> <p>If there is no student response, use this as an opportunity to use light, sound, movement and touch to work on joint attention and engagement.</p>
APPLY		
<p>Students describe what was done.</p> <p><u>Ask</u> the student to tell what they did.</p> <p>Student should tell how they decided (thinking process) on their answer.</p>	<p>Student may use vocabulary such as:</p> <p>All, in, some, not</p>	<p>Adults are not to provide any coaching at this point.</p> <p>Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Only direction prompts may be repeated.</p>
<p>Get feedback</p> <p>If no response (give plenty of wait time), then model a Think Aloud using the student's mode of communication.</p> <p>Provide feedback.</p> <p>Bring attention to the thinking process more than the correctness of the answer in the beginning. Try to look for connections</p>	<p>Use the student's method of communication to share feedback.</p> <p>Possible words you may use:</p>	

<p>demonstrating that the student understands the concept.</p> <p>For example: "You are correct. The colored markers that are in the box are a set. They are all together in a box. The loose colored pencils are separate. They are away from each other."</p>	<p><i>You, it, some, same, different, more, in, not</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student's thinking process went, expanding on their description of the process. Model the correct language.</p> <p>For example: "You looked at both groups of colored pencils. You saw that some were in a box as a set and some were loose, or separate. Great job thinking!"</p>	<p>You may use vocabulary such as:</p> <p><i>Look, it, do, like</i></p>	
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend to items/no response</p> <p><input type="checkbox"/> Attended to items/no response</p> <p><input type="checkbox"/> Attended to items/response incorrect</p> <p><input type="checkbox"/> Attended to items/response partially correct</p> <p><input type="checkbox"/> Attended to items/response fully correct</p>		

Recognize Subset



Purposes

Students will be able to use tools like the ten-frame to point out whole and parts (e.g., a row of 5 dots and a row of 4 dots are parts or subsets of 9). In order to understand division, students must learn to organize items into groups/sets based on a common characteristic such as size, color, shape, or texture. Students learn how to sort items by separating a group of items into two groups (e.g., music I like/music I don't like; red fidgets/black fidgets). As students gain comfort sorting items into sets, they are encouraged to use their language to convey their thought process by identifying and naming the characteristic that determines the set (e.g., color, length).

- **M.EE.N-CN.2.a** Use the commutative, associative, and distribute properties to add, subtract, and multiply whole numbers.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- Items to use during instruction can be found here:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Silverware (if safe for the students; alternatives could be different kinds of crackers or a collection of animal pictures such as different kinds of dogs) to include spoon, fork, and knife; plates and plastic cups
- A visual/physical organizer of some kind on which to place each set/subset of items if needed.

*(*Note: This lesson routine can be repeated with many different collections. Begin with collections that are fairly familiar to the student and then move on to less familiar items before moving on to using more abstract math materials such as counters and 10-frames.)*

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
Activate prior knowledge or build new knowledge Complete shared reading activity about collections. While reading, elicit comments	Model using student's form of communication.	https://shared.tarheelreader.org/shared/read/so-many-collections

about the differences and similarities between the items within the set.	Same, different, in	
Establish a purpose "Today we will learn how to make a large set into smaller subsets."		
Teach and model the concept Place the silverware (use familiar term), plates and cups in front of the student. <u>Say:</u> "This is a set of dishes and silverware (use familiar term). We put food on some of them. We put drinks in others. We use some of them to pick up the food. They are all used for eating food. We can make smaller sets with each kind of tool." "Watch me make smaller subsets. First I separate the items that we put food on or in from the items we use to pick up the food. I have two big sets. 1-2. Now, I can separate the plates from the cups. We put food on the plates. We put drinks in the cups." Model placing the plates in a stack and placing the cups in a stack. "Now I move on to the silverware. I see three different kinds of silverware - spoons, forks, and knives. I can make smaller groups or subsets. In one subset I put all of the spoons. I put all of the forks in another subset. I put all of the knives in another subset. I see 5 subsets. 1-2-3-4-5." Model making the subsets.	Model using student's form of communication. Same, different, in, put, here, I	This is an opportunity to develop joint attention and engagement through the use of light, sound, touch, and movement.
THINK AND DO		
Students think about what to do: Place a mixed collection of the items in front of the student. <u>Say:</u> "Sort these into two sets." Then, <u>say:</u> "Sort them into smaller subsets."	Model using student's form of communication. You, do	Provide ample wait time based on knowledge of the student's processing needs.

<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>In the case of the example items, the student should end up with plates/cups and all the silverware in two different groups based on the original direction.</p> <p>After the second direction the student should have a subset of plates, a subset of cups, and then one subset of each of the following: spoons, forks, and knives.</p>		<p>There should be no adult coaching at this time.</p> <p>This is an opportunity for observation and to note the student's response.</p> <p>If the student has physical limitations, eye gaze, a stick for pushing items, or verbal/AAC direction to an adult may be used.</p> <p>Provide an organizing mat if the student has trouble placing items in separate groups/sets.</p>
APPLY		
<p>Students describe what was done.</p> <p><u>Say:</u> "Tell me what you did."</p> <p>Student should tell how they decided (thinking process) on their answer. They may say: "I put." "I look." "It same." "It different."</p>	<p>Model using student's form of communication.</p> <p>You, do, what</p>	<p>Adults are not to provide any coaching at this point.</p> <p>Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Only direction prompts may be repeated.</p>
<p>Get feedback</p> <p>Provide feedback.</p> <p>Bring attention to the thinking process more than the correctness of the answer in the beginning. Try to look for connections demonstrating that the student understands the concept.</p>	<p>Model using student's form of communication.</p> <p>Same, different, in, put, here, I</p>	<p>If there was no student response then use this is another opportunity to develop joint attention and engagement through the use of light, sound, touch, and movement.</p>

<p>If the student was correct, acknowledge and move on to the next step.</p> <p>If the student was not correct, simply model the process again using the script in the teaching phase as a guide.</p>		
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student's thinking process went, expanding on their description of the process. Model the correct language.</p> <p>Example: "You looked for the items that were the same. You put all of the plates together. You put all of the cups together. You put all of the spoons together. You put all of the forks together. You put all of the knives together. The plate and cups are used to put food on or in, but each of those groups has a different shape. All of the silverware is used to pick up food, but each one is a different shape. You made sets and then you made smaller sets or subsets. Great work thinking!"</p>	<p>Model using student's form of communication.</p> <p><i>Same, different, in, put, here, I</i></p>	
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend to items/no response</p> <p><input type="checkbox"/> Attended to items/no response</p> <p><input type="checkbox"/> Attended to items/response incorrect</p> <p><input type="checkbox"/> Attended to items/response partially correct</p> <p><input type="checkbox"/> Attended to items/response fully correct</p>		

Distal Precursor

Purposes

Students will be able to add items to a set and combine sets to create a new set.

- **M.EE.N-CN.2.a** Use the commutative, associative, and distribute properties to add, subtract, and multiply whole numbers.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- 3 ten-frames for each student, including one with which to model if necessary:
 - **Five Frame PDF**
https://lrt.ednet.ns.ca/PD/BLM/pdf_files/five_and_ten_frames/five_frame.pdf
- Items to count. A list of ideas can be found here:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson at least 10 cubes for each student plus 10 more with which to model
- A simple recipe plus its ingredients: <https://accessiblechef.com/recipes/>

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Make a simple recipe, either one you are familiar with or you may try one from the link provided.</p> <p>While making the recipe, use the word 'combine' multiple times as the ingredients are added to help the students understand the meaning.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Put, all, in here, some</p>	<p>https://accessiblechef.com/recipes/pizza-in-a-mug/</p>

<p><i>Establish a purpose</i></p> <p><u>Say:</u> “Just like combining ingredients to make a recipe, we can combine other items together to make something bigger.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Put, in, more</i></p>	
<p><i>Teach and model the concept</i></p> <p>Place connecting cubes and the ten-frames in front of the students. Allow them to interact with the items. Demonstrate how to put one cube in each box. Allow the students to try.</p> <p><u>Say:</u> “Combine means put together into one group. We combined the ingredients in the recipe above to make _____. We can do the same thing with objects in sets. Watch.”</p> <p>In one ten-frame, count out loud while you place 4 cubes. “1-2-3-4.” In the other ten frame, count out loud while you place 3 cubes. “1-2-3.”</p> <p>Place a third ten-frame below the two others.</p> <p><u>Say:</u> “I can combine these two ten-frames into one. Watch.”</p> <p>Model taking each of the cubes from its original ten-frame and placing it into the new ten-frame. Count each cube as you move it. “1-2-3-4-5-6-7. I combined these two ten-frames into one. I had 4 cubes in the first one and 3 cubes in the second one. That makes a total of 7 cubes all together.”</p> <p>Model at least 2 more times with other amounts such as 5 + 3, 6 + 4, etc. Use the above script as a guide.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>Put, make, in, here</i></p>	<p>Allow vision-impaired students to feel each group or use tactile ten-frames matching the problem you are modeling. These could be made by gluing counters onto cardboard ten-frames in different combinations.</p>
<p>THINK AND DO</p>		
<p><i>Students think about what to do:</i></p> <p>Place two partially filled ten-frames in front of the student.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p>	<p>If the student has good fine motor skills, you can alternately give them the cubes to put into the ten-frame,</p>

<p>Have the student count (out loud or in their head) each set.</p> <p>Then <u>say</u>: "Combine the sets. How many altogether?"</p>	<p><i>Put all</i></p>	<p>guiding them to fill each successive box, rather than random boxes.</p> <p>Students with vision-impairments or physical limitations might use the pre-made ten-frames as described above and then use cubes/counters to put into a 3D ten frame.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>Students should move the cubes to the third five-frame filling it appropriately.</p> <p>Students should count, or possibly subitize based on how the five-frame looks, to find the total cubes.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work on joint attention (see below).</p> <p>Spend the time observing and making notes about the student's responses.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask</u>: "What did you do?"</p> <p>We are looking for the actions they went through to get the answer -Ex: "I put all here."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, do, put, all, here</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Great job combining!"</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	

<p>If the student was incorrect, reset the ten-frames and model how to combine and count again using the teaching script above.</p>	<p><i>Put all</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: <i>“You put all of the cubes from each of the top ten-frames into the bottom ten-frame. You combined them together. You found the total. Great job!”</i></p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, put, all, in, here, some</i></p>	<p>Expand on the student’s language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Demonstrate Concept of Addition/Multiplication

Purposes

Students will actively participate in one-to-one distribution of objects to person (e.g., giving each person in the group two pencils), objects to objects (e.g., given four counters, students line up four more counters in front of or on top of the first set), and objects to available space (e.g., given three chairs at a table, the student places a cup on the table for each available chair).

- **M.EE.N-CN.2.a** Use the commutative, associative, and distribute properties to add, subtract, and multiply whole numbers.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items to use for instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Use an upcoming or already planned craft or art activity.</p> <p>Place all of the needed materials in the middle of the group</p> <p>Provide directions and model as usual. Instead of immediately handing out the materials, just give the direction to begin, then wait. Wait for a student to indicate that they need materials to begin. When one student has noticed and shows a desire to begin and would like to have them materials, talk about the best way to get everyone materials so they have equal amounts. This can be turned into a quick social</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, put, here, same, on</p>	<p>Resources/Ideas to get you started:</p> <p>10 Easy Crafts for Kids with Motor Disabilities (https://coachart.org/blog/10-easy-crafts-for-kids-with-motor-disabilities/)</p> <p>5 Simple Art Projects For a Child with Special Needs (https://www.autismparentingmagazine.com/art-projects-for-special-needs/)</p>

skills lesson as well. Discuss how they can't just grab what they need.		Inclusion/Special Needs Art Projects Archives (https://www.deepspaceparkle.com/category/art-lessons-by-subject/inclusionspecial-needs-art-projects/)
<i>Establish a purpose</i> "Today we will learn how to help pass out materials so everyone gets an equal share."	Model using student's form of communication. For example: AAC, Braille, signing. <i>Put, same</i>	
<i>Teach and model the concept</i> <u>Say:</u> "When we do a project, everyone needs the same amount of materials. For example, you will each need one piece of red construction paper (adjust this per your craft or project). Set one piece of paper in front of each student." Model.	Model using student's form of communication. For example: AAC, Braille, signing. <i>Same, you, put, here</i>	
THINK AND DO		
<i>Students think about what to do:</i> Give the student something to pass out. For example: "Give 2 pieces of green paper to each person."	Model using student's form of communication. For example: AAC, Braille, signing. <i>You, do, here</i>	You may wish to provide a template on which to place the materials to cue for number and placement. As the student becomes more proficient, fade the template by making it smaller or not as noticeable.
<i>Students do:</i> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer 		Allow wait time for processing based on your knowledge of the student's needs. There should be no adult coaching at this time, other than

<p>The student should place the item(s) in the appropriate locations.</p>		<p>prompts to respond or to work on joint attention.</p> <p>Use this as an opportunity to make observations and record student responses.</p>
APPLY		
<p><i>Students describe what was done.</i> <u>Ask:</u> “What did you do?”</p> <p>We are looking for the actions they went through to get the answer. Example: “I put all.” “I put on.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, put</i></p>	<p>Allow wait time based on your knowledge of the student’s needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: “Great job giving everyone 2 sheets of green paper!”</p> <p>If the student, was incorrect, model how to place the items and provide the student some appropriate prompting to try it again immediately after modeling.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, do</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: “You gave each person 2 pieces of paper. You set the paper right in front of them so they could use it. Thank you!”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, put, on, in, here</i></p>	<p>Expand on the student’s language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p>___ Did not attend/no response ___ Attended/no response ___ Attended/response incorrect ___ Attended/response partially correct ___ Attended/response fully correct</p>		

Explain Place Value for Ones and Tens



Purposes

Given numbers greater than nine (two-digit numbers), students will be able to use tools to create tactual models of tens and ones (e.g., ten-frames, connecting cubes, bundling sticks). Educators will describe these numbers as __ groups of ten and __ ones. (e.g., 13 is 1 group of ten and 3 ones).

- **M.EE.N-CN.2.b** Solve real-world problems involving addition and subtraction of decimals and whole numbers, using models when needed.
- **M.EE.N-CN.2.c** Solve real-world problems involving multiplication of decimals and whole numbers, using models when needed.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- Ten-frames, connecting cubes, place value blocks, bundling sticks
- For this example lesson:
 - Place value blocks (longs and cubes)
 - **Place Value Mat:**
<http://mathwire.com/templates/placevalue.pdf>
- Two-digit number cards: Use numbers with which the students have been counting. Index cards and markers can be used to make them.

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<i>Activate prior knowledge or build new knowledge</i> Provide the student with the cubes. Ask them to make single digit numbers with the cubes. Review the terminology of 'ones.' Make connections to the ten-frame and how it can show ten (full frame) and ones (partial frame).	Model using student's form of communication. For example: AAC, Braille, signing. <i>Same, put, here, some, all, more, not</i>	If you regularly do traditional calendar time and it includes a place value activity, this would be a great time to start including it if you haven't already.

<p>You may also want to practice rote counting as high as they can.</p>		<p>Encourage non-verbal students to count in their head and keep track on a number line or chart.</p>
<p><i>Establish a purpose</i></p> <p><i>"Today we will learn to show two-digit numbers with these place value blocks."</i></p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Make, here, put</i></p>	
<p><i>Teach and model the concept</i></p> <p>Present the place value materials in front of the students. Allow them to interact with the materials.</p> <p>If the students have not used place value blocks before, provide a short introduction/review of what they represent.</p> <p>For example: Show a cube. <i>"This is a 'cube'. It represents one unit. We put the 'cubes' or ones in the ones column on the place value mat. It tells us how many ones are in a number."</i> Show a 'long'. <i>"This is a 'long'. It represents 10 ones. We put the 'longs' in the tens column. It tells us how many tens are in a number."</i></p> <p>Present a number on a number card. For example, 15. <u>Say:</u> <i>"This is fifteen. It is a two-digit number."</i> Refer to the place value mat. <i>"Two digit numbers have a ones place and a tens place. In the number 15 there is one ten and 5 ones."</i> Model placing 5 ones and 1 long in the appropriate spots.</p> <p>Count all of the sections on the long then continue counting the ones to verify that it is 15. Encourage the students to count with you.</p> <p>Model with several other numbers using similar language.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>It, here, put, some, more, not, same, different, all</i></p>	<p>Fine motor skills can be practiced through the picking up and placing of the materials.</p> <p>For vision-impaired students, provide a tactile place value mat. Gluing string on the mat can help the student find the different sections.</p> <p>Number cards should be presented in braille for students who are learning braille.</p> <p>You may wish to spend a few minutes practicing identifying which are the blocks for ones and which are the blocks for tens. Through repetitions of the lesson, they will naturally become more proficient at distinguishing between the two.</p>

		It might be helpful to have the students copy your work as you do it after the first time you model. Prompt them to make theirs look/feel like yours.
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place some place value blocks and the place value mat in front of the student.</p> <p>Show the student a two digit number. Say the number aloud.</p> <p><u>Say:</u> <i>"Show me the number."</i></p> <p>Begin with the teens numbers and then add in numbers greater than 20.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, put, make, here</i></p>	<p>For vision-impaired students, provide a tactile place value mat. Gluing string on the mat can help the student find the different sections.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>The student should use the correct number of longs and cubes to represent the two-digit number.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>The student may use eye gaze and or verbal/AAC to direct an adult.</p> <p>Use this time to make observations and record the student's responses.</p>

APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "I look." "More."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes. You made 12. One ten and 2 ones is 12."</p> <p>If the student was incorrect, re-teach/model using the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, make</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Example: "Yes. Twelve has one ten and two ones. You put the long in the tens column and you put the two cubes in the ones column. One ten and two ones equals twelve."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Put, here, same</i></p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Explain Ten as a Composition of 10 Ones



Purposes

Given a variety of tools (e.g., ten-frames, connecting cubes, bundling sticks), students will be able to make groups of ten.

- **M.EE.N-CN.2.b** Solve real-world problems involving addition and subtraction of decimals and whole numbers, using models when needed.
- **M.EE.N-CN.2.c** Solve real-world problems involving multiplication of decimals and whole numbers, using models when needed.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- Ten-frames, connecting cubes, bundling sticks, place value blocks, etc.
- For this example lesson:
 - Place value blocks
 - Number line/chart
 - **10**
https://docs.google.com/document/d/17Tiy6VbNnWtLoHz0Nd33-Idn_IdZHmA9k-GYJ785hZM/edit
- Numbers in the Teens (Have a Group of 10) - a place value song for kids]
<https://www.youtube.com/watch?v=uedvwH6Ay18>

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Watch video (link above) to review teen numbers.</p> <p>If the student already seems to understand ten-frames and that they represent ten, spend</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>Look, what</p>	<p>For students with vision impairments, provide concrete materials that they may feel (place value blocks).</p>

<p>a few minutes reviewing. Present a ten-frame and <u>ask</u>: "How many?"</p>		
<p><i>Establish a purpose</i></p> <p>"Today you will learn how to show me the quantity of ten."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Make, put, some</i></p>	
<p><i>Teach and model the concept</i></p> <p>Present the place value blocks (cubes and rods/longs) to the students and allow them to interact with them.</p> <p>Place the visual for the number 10 in front of the students.</p> <p><u>Say</u>: "This is the number ten. We will learn how to show the quantity of ten in two different ways."</p> <p>Place a rod/long in front of the students.</p> <p><u>Say</u>: "This is a rod/long. It equals ten. I can count the individual cubes. Watch." (Touch each cube as you count. Encourage the students to count in their heads with you.) "1-2-3-4-5-6-7-8-9-10." Place the "10" card next to it.</p> <p>I can also show ten by counting out ten cubes. Watch." (Model counting out ten cubes and placing them next to the long. Encourage the students to count in their heads with you.) "1-2-3-4-5-6-7-8-9-10."</p> <p>Repeat the modeling process with both the rod/long and the cubes. On each repetition, arrange the blocks in different positions (horizontal, vertical, diagonal, etc.)</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Look, make, put, here, some, same</i></p>	<p>Ensure that students with vision impairments have an opportunity to feel the place value blocks as you are teaching.</p>

THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Place a collection of place value cubes (more than 10) in front of the student along with a 'rod' or 'long'.</p> <p><u>Say:</u> "Show me 10."</p> <p><u>Say:</u> "Use the cubes to show me 10."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, make, put, here</i></p>	<p>As the student becomes proficient using the place value blocks, begin to add repetition with variety by using different materials such as connecting cubes, bundling sticks, and ten-frames.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>For the first request, accept the student selecting the rod or counting out ten cubes.</p> <p>The student should be able to represent 10 both ways.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work.</p> <p>Students may use eye gaze and/or verbal/AAC to direct an adult.</p> <p>Use this time to make observations and record notes about the student's responses.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Example: "I look." "I do."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>

<p>Get feedback</p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes, you made 10."</p> <p>If the student is incorrect, re-teach/model following the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, make</p>	
<p>Make explicit what the students were thinking and doing</p> <p>Describe what you saw the student do.</p> <p>Example: "You counted ten cubes. The ten cubes here equal the 'rod'/'long' that represents ten. You showed me two ways of representing 10."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p>You, put, make, here, some</p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p>Formative Assessment (option)</p> <p>___ Did not attend/no response</p> <p>___ Attended/no response</p> <p>___ Attended/response incorrect</p> <p>___ Attended/response partially correct</p> <p>___ Attended/response fully correct</p>		

Recognize a Unit



Purposes

Students will be able to select a unit of one or a unit of ten when presented in a variety of ways (e.g., ten-frames, connecting cubes, bundling sticks).

- **M.EE.N-CN.2.b** Solve real-world problems involving addition and subtraction of decimals and whole numbers, using models when needed.
- **M.EE.N-CN.2.c** Solve real-world problems involving multiplication of decimals and whole numbers, using models when needed.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- List of items that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- Ten-frames, connecting cubes, bundling sticks, place value blocks, etc.
- For this example lesson:
 - Place value blocks
 - Number line/chart
 - **10**
https://docs.google.com/document/d/17Tiy6VbNnWtLoHz0Nd33-Idn_IdZHmA9k-GYJ785hZM/edit
 - **1**
https://docs.google.com/document/d/1XXJVCN7AmJurE2eOquUnQVniznjG9mKheq8Q_h2G-u8/edit
- **Unit vocabulary card** (2 copies)
https://docs.google.com/document/d/1yWbIZWbUUCpAsgORmDhqdC_Z7udqMeSKsaj5xdsEm_A/edit

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Practice counting to ten and demonstrating one-to-one correspondence.</p>	<p>Model using student's form of communication. For</p>	<p>Non-verbal students may be prompted to count in their heads and follow along on</p>

	<p>example: AAC, Braille, signing.</p> <p><i>You, do</i></p>	<p>their number line/chart.</p> <p>Look for multiple opportunities throughout the day to make groups of ten and compare to one item. This will build overall understanding. For example, when in a large group of students, ask them to make a group of ten and ask a student to stand separately. During snack time, make groups of 10 crackers and single crackers. Put pencils in groups of ten.</p>
<p><i>Establish a purpose</i></p> <p>“Today you will learn to show me a unit of one and a unit of ten.”</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, make, look</i></p>	
<p><i>Teach and model the concept</i></p> <p>Present the place value blocks and allow the students to interact with the materials.</p> <p>Hold up a cube. “This is a unit of one. It equals one.” Label with the “1” and the Unit vocabulary card.</p> <p>Hold up a rod/long. “This is a unit of ten. It equals ten.” Label with the “10” and the Unit vocabulary card.</p> <p>Rearrange the materials and repeat. You may use different materials during the teaching phase.</p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>It, same</i></p>	<p>Ensure that students with vision impairments have a chance to feel the materials during instruction.</p>

THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Present some cubes and some rods/longs.</p> <p><u>Say:</u> "Show me a unit of one."</p> <p><u>Say:</u> "Show me one unit of ten."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Make, you, here</i></p>	<p>As the student becomes more proficient, provide other materials such as connecting cubes, bundling sticks, and ten-frames. Include more items than they need.</p> <p>You may find that a student will have more interest with other materials. If so, feel free to start with those materials during instruction and initial practice.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>Student should select/indicate one cube for the first request.</p> <p>Student should select/indicate one rod/long for the second request.</p>		<p>Allow wait time for processing based on your knowledge of the student's needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or to work on joint attention.</p> <p>Student may use eye gaze and/or verbal/AAC to direct an adult.</p> <p>Use this time to observe and make notes about the student's responses.</p>

APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Ex: "I look." "More." "Not more." "Same." "Different."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, why</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes. That is a unit of one. That is a unit of ten."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, did, make, it</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do.</p> <p>Ex: "You counted one cube. You matched it to the 1 unit. You counted to ten. You matched it to the unit of 10."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p> <p><input type="checkbox"/> Attended/response incorrect</p> <p><input type="checkbox"/> Attended/response partially correct</p> <p><input type="checkbox"/> Attended/response fully correct</p>		

Solve Repeated Addition Problems



Purposes

After actively participating in one-to-one distribution of objects to person (e.g., giving each person in the group two pencils), objects to objects (e.g., given four counters, students line up four more counters in front of or on top of the first set), and objects to available space (e.g., given three chairs at a table, the student places a cup on the table for each available chair), students will be able to represent and solve the related addition problem to find the total number of items/objects.

- **M.EE.N-CN.2.a** Use the commutative, associative, and distribute properties to add, subtract, and multiply whole numbers.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative assessment for each student
- List of materials that can be used during instruction:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Markers
- Whiteboard, dry erase markers

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
Activate prior knowledge or build new knowledge Provide opportunities to hand out materials, snacks, or other items in a 1:1 fashion. For example, have a student hand out 2 markers to each person for art time, or exactly 3 crackers to each person for snack time. Reinforce that it is the same amount to each person.	Model using student's form of communication. For example: AAC, Braille, signing. You, put, he/she, here, in	45+ Crafts for Kids with Special Needs https://www.allfreekids.com/Learning-Activities-for-Children/Crafts-for-Kids-with-Special-Needs
Establish a purpose "Today we will act out a math problem, represent it using numbers and symbols, then solve it."	Model using student's form of communication. For example: AAC, Braille, signing.	

	<i>Make, it, here</i>	
<p><i>Teach and model the concept</i></p> <p>After handing out the materials take a few minutes to model writing a related repeated math problem. Then share the problem. For example: <i>“You gave 2 markers to Tom. You gave 2 markers to Sam. You gave 2 markers to Sue.”</i></p> <p>Model writing the problem: <i>“We can represent that problem using numbers and symbols. Watch. I write a 2 to show we gave 2 markers to Tom. I write a plus sign and another 2 to show we also gave 2 markers to Sam. I then write another plus sign and the number 2 to show we also gave 2 markers to Sue. Then I write an equals sign to show we will now write the total quantity of markers that we handed out. $2 + 2 + 2 =$. I will count all of the markers. 1-2-3-4-5-6. 2 markers plus 2 markers plus 2 markers equals 6 markers.”</i></p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, put, look, same, different, some, all</i></p>	<p>Encourage the students to practice their mark making skills at the same time you are writing the math problem. While they can select correct answer choices during their Think and Do activity, this is a great time to provide them materials with which to make math marks using a variety of writing instruments and materials. Be creative and try lots of different things to see which ones the students may be able to use with some adaptations. Work with your OT.</p>
THINK AND DO		
<p><i>Students think about what to do:</i></p> <p>Ask the student to hand out a different amount of markers to several students.</p> <p><u>Say:</u> <i>“Show me the problem.”</i></p> <p><u>Say:</u> <i>“Solve the problem.”</i></p>	<p>Model using student’s form of communication. For example: AAC, Braille, signing.</p> <p><i>You, do</i></p>	<p>Provide number sentences that match the scenario along with at least one (work up to 2) distractor.</p> <p>Provide number cards that represent possible answers.</p>
<p><i>Students do:</i></p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer 		<p>Allow wait time for processing based on your knowledge of the student’s needs.</p> <p>There should be no adult coaching at this time, other than prompts to respond or</p>

<p>The student should select the correct number sentence that matches how he/she handed out materials.</p> <p>The student should count up all of the materials and select the answer to the number sentence.</p>		<p>to work on joint attention.</p> <p>Students may use eye gaze and/or verbal/AAC to direct an adult.</p> <p>Use this as an opportunity to observe and record notes about the students responses.</p>
APPLY		
<p><i>Students describe what was done.</i></p> <p><u>Ask:</u> "How do you know?"</p> <p>We are looking for the actions they went through to get the answer. Ex: "I look." "Same." "I put."</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>Why</i></p>	<p>Allow wait time based on your knowledge of the student's needs.</p>
<p><i>Get feedback</i></p> <p>If the student was correct, acknowledge it and move on to the next step. For example: "Yes. You showed the correct problem to match how you passed out the materials. You solved it correctly."</p> <p>If the student was incorrect, re-teach/model following the teaching script above.</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, did, it, same</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Describe what you saw the student do. Ex: "You counted the materials and wrote a number that showed how many you gave each person. You repeated it because it was the same. You found the total. Great job!"</p>	<p>Model using student's form of communication. For example: AAC, Braille, signing.</p> <p><i>You, did, it, look, same, put</i></p>	<p>Expand on the student's language. Use simple complete sentences. This is an opportunity to model sentence structure and reinforce the thinking process.</p>
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend/no response</p> <p><input type="checkbox"/> Attended/no response</p>		

- ☐ Attended/response incorrect
- ☐ Attended/response partially correct
- ☐ Attended/response fully correct

Recognize Set/Separateness



Purposes

The student will be able to recognize that two or more sets or groups of items exist. students recognize when items are grouped together into a set or separated out.

- **M.EE.N-CN.2.a** Use the commutative, associative, and distribute properties to add, subtract, and multiply whole numbers.
- **M.EE.N-CN.2.b** Solve real-world problems involving addition and subtraction of decimals and whole numbers, using models when needed.
- **M.EE.N-CN.2.c** Solve real-world problems involving multiplication of decimals and whole numbers, using models when needed.

Materials

- Familiar items that come in sets (bundled together) and separate (loose):
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: 2 identical boxes of colored pencils (1 set will stay in the box, the other set will be out of the box)
- CORE vocabulary board and/or AAC device for each student
- Copy of Formative Assessment for each student

*(*Note: This lesson routine can also be used with items that may be used to meet post-secondary goals. For example, making sets of utensils wrapped in a napkin for a restaurant or sorting parts into bags for a manufacturer. Get creative!)*

Lesson Plan Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Go on a Treasure Hunt to find items that are in a container and similar items that are loose. (You may need to set this up.) As you and the students find things that are in a container and loose start to use the words set and separate.</p>	<p>Model using Core board or AAC device.</p> <p>In, not, here, put</p>	<p>This is an opportunity to have some fun using light, sound/music, movement, and touch to work on joint attention and engagement. Move about the room in different ways. Use</p>

<p>"I found a set of crayons. Some are already in the box, but some fell out and are separate."</p> <p>This can be used as an opportunity to put things where they belong and share how things go together. For example: "We don't put markers in the crayon box. Markers aren't part of the crayon set. They can be used to draw like crayons, but they are different."</p>		<p>flashlights to find things. Vary your tone of voice and body language to work on gaining responses from the students.</p>
<p>Establish a purpose</p> <p>"We are going to learn some new words that help us describe those things that go together and those things that don't belong."</p>	<p>Model using Core board or AAC device.</p> <p><i>Some, go, not, in, same, some</i></p>	
<p>Teach and model the concept</p> <p>Using the familiar items follow the sequence below: (Example: Box of colored pencils)</p> <p>Present the box of colored pencils and <u>say</u>: "This is a set of colored pencils. They are all together in the box. The box helps them stay together. They are all used to color or draw."</p> <p>Present some colored pencils that are not in the box, but loose. Say: "These colored pencils are separate from those colored pencils. They are not in the box. They are separate."</p> <p>Point to the boxed colored pencils and <u>say</u>: "This group of colored pencils is in a set."</p> <p>Point to the loose colored pencils and <u>say</u>: "This group of colored pencils is separate."</p>	<p>Model using Core board or AAC device.</p> <p><i>All, in, some, not</i></p>	
THINK AND DO		
<p>Students think about what to do:</p> <p>Place the box of colored pencils and the loose colored pencils in front of the student.</p> <p>Ask student to point or indicate which is the "set."</p>	<p>Model with Core Board or AAC device.</p> <p><i>Where, in, not in</i></p>	<p>Provide ample wait time based on the student's processing needs.</p>

Ask student to point or indicate which is "separate."		
<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>Provide wait time appropriate for that student.</p> <p>Observe student.</p> <p>Student provides answer using their mode of communication.</p>	<p>Possible words they may use:</p> <p>In, not in</p> <p>Most likely student will just point or use "stop" for partner-assisted scanning</p>	<p>There is to be no adult coaching at this point in the lesson.</p> <p>Use this as an opportunity to observe the student's responses.</p> <p>If there is no student response, use this as an opportunity to use light, sound, movement and touch to work on joint attention and engagement.</p>
APPLY		
<p>Students describe what was done.</p> <p><u>Ask</u> the student to tell what they did.</p> <p>Student should tell how they decided (thinking process) on their answer.</p>	<p>Student may use vocabulary such as:</p> <p>All, in, some, not</p>	<p>Adults are not to provide any coaching at this point.</p> <p>Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Only direction prompts may be repeated.</p>
<p>Get feedback</p> <p>If no response (give plenty of wait time), then model a Think Aloud using the student's mode of communication.</p> <p>Provide feedback.</p> <p>Bring attention to the thinking process more than the correctness of the answer in the beginning. Try to look for connections</p>	<p>Use the student's method of communication to share feedback.</p> <p>Possible words you may use:</p>	

<p>demonstrating that the student understands the concept.</p> <p>For example: “You are correct. The colored markers that are in the box are a set. They are all together in a box. The loose colored pencils are separate. They are away from each other.”</p>	<p><i>You, it, some, same, different, more, in, not</i></p>	
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student’s thinking process went, expanding on their description of the process. Model the correct language.</p> <p>For example: “You looked at both groups of colored pencils. You saw that some were in a box as a set and some were loose, or separate. Great job thinking!”</p>	<p>You may use vocabulary such as:</p> <p><i>Look, it, do, like</i></p>	
<p><i>Formative Assessment (option)</i></p> <p>___ Did not attend to items/no response</p> <p>___ Attended to items/no response</p> <p>___ Attended to items/response incorrect</p> <p>___ Attended to items/response partially correct</p> <p>___ Attended to items/response fully correct</p>		

Recognize Subset



Purposes

Students will be able to use tools like the ten-frame to point out whole and parts (e.g., a row of 5 dots and a row of 4 dots are parts or subsets of 9). In order to understand division, students must learn to organize items into groups/sets based on a common characteristic such as size, color, shape, or texture. Students learn how to sort items by separating a group of items into two groups (e.g., music I like/music I don't like; red fidgets/black fidgets). As students gain comfort sorting items into sets, they are encouraged to use their language to convey their thought process by identifying and naming the characteristic that determines the set (e.g., color, length).

- **M.EE.N-CN.2.a** Use the commutative, associative, and distribute properties to add, subtract, and multiply whole numbers.

Materials

- Copy of Core Vocabulary board for each student
- Copy of Formative Assessment for each student
- Items to use during instruction can be found here:
 - **Educator Resource Page IE | DLM**
https://dynamiclearningmaps.org/erp_ie/iowa-math
- For this example lesson: Silverware (if safe for the students; alternatives could be different kinds of crackers or a collection of animal pictures such as different kinds of dogs) to include spoon, fork, and knife; plates and plastic cups
- A visual/physical organizer of some kind on which to place each set/subset of items if needed.

*(*Note: This lesson routine can be repeated with many different collections. Begin with collections that are fairly familiar to the student and then move on to less familiar items before moving on to using more abstract math materials such as counters and 10-frames.)*

Lesson Plan		
Teacher/Student Actions	AAC Suggestions	Notes
ANCHOR		
<p>Activate prior knowledge or build new knowledge</p> <p>Complete shared reading activity about collections. While reading, elicit comments</p>	<p>Model using student's form of communication.</p>	<p>https://shared.tarheelreader.org/shared/read/so-many-collections</p>

about the differences and similarities between the items within the set.	Same, different, in	
Establish a purpose "Today we will learn how to make a large set into smaller subsets."		
Teach and model the concept Place the silverware (use familiar term), plates and cups in front of the student. <u>Say:</u> "This is a set of dishes and silverware (use familiar term). We put food on some of them. We put drinks in others. We use some of them to pick up the food. They are all used for eating food. We can make smaller sets with each kind of tool." "Watch me make smaller subsets. First I separate the items that we put food on or in from the items we use to pick up the food. I have two big sets. 1-2. Now, I can separate the plates from the cups. We put food on the plates. We put drinks in the cups." Model placing the plates in a stack and placing the cups in a stack. "Now I move on to the silverware. I see three different kinds of silverware - spoons, forks, and knives. I can make smaller groups or subsets. In one subset I put all of the spoons. I put all of the forks in another subset. I put all of the knives in another subset. I see 5 subsets. 1-2-3-4-5." Model making the subsets.	Model using student's form of communication. Same, different, in, put, here, I	This is an opportunity to develop joint attention and engagement through the use of light, sound, touch, and movement.
THINK AND DO		
Students think about what to do: Place a mixed collection of the items in front of the student. <u>Say:</u> "Sort these into two sets." Then, <u>say:</u> "Sort them into smaller subsets."	Model using student's form of communication. You, do	Provide ample wait time based on knowledge of the student's processing needs.

<p>Students do:</p> <ul style="list-style-type: none"> • Solve the problem • Build the model • Find the matching shapes • Put them in order • Interpret the data, etc. • Describe/share answer <p>In the case of the example items, the student should end up with plates/cups and all the silverware in two different groups based on the original direction.</p> <p>After the second direction the student should have a subset of plates, a subset of cups, and then one subset of each of the following: spoons, forks, and knives.</p>		<p>There should be no adult coaching at this time.</p> <p>This is an opportunity for observation and to note the student's response.</p> <p>If the student has physical limitations, eye gaze, a stick for pushing items, or verbal/AAC direction to an adult may be used.</p> <p>Provide an organizing mat if the student has trouble placing items in separate groups/sets.</p>
APPLY		
<p>Students describe what was done.</p> <p><u>Say:</u> "Tell me what you did."</p> <p>Student should tell how they decided (thinking process) on their answer. They may say: "I put." "I look." "It same." "It different."</p>	<p>Model using student's form of communication.</p> <p>You, do, what</p>	<p>Adults are not to provide any coaching at this point.</p> <p>Adults should observe the student's responses and make notes (refer to FA below).</p> <p>Only direction prompts may be repeated.</p>
<p>Get feedback</p> <p>Provide feedback.</p> <p>Bring attention to the thinking process more than the correctness of the answer in the beginning. Try to look for connections demonstrating that the student understands the concept.</p>	<p>Model using student's form of communication.</p> <p>Same, different, in, put, here, I</p>	<p>If there was no student response then use this is another opportunity to develop joint attention and engagement through the use of light, sound, touch, and movement.</p>

<p>If the student was correct, acknowledge and move on to the next step.</p> <p>If the student was not correct, simply model the process again using the script in the teaching phase as a guide.</p>		
<p><i>Make explicit what the students were thinking and doing</i></p> <p>Explain how the student's thinking process went, expanding on their description of the process. Model the correct language.</p> <p>Example: "You looked for the items that were the same. You put all of the plates together. You put all of the cups together. You put all of the spoons together. You put all of the forks together. You put all of the knives together. The plate and cups are used to put food on or in, but each of those groups has a different shape. All of the silverware is used to pick up food, but each one is a different shape. You made sets and then you made smaller sets or subsets. Great work thinking!"</p>	<p>Model using student's form of communication.</p> <p><i>Same, different, in, put, here, I</i></p>	
<p><i>Formative Assessment (option)</i></p> <p><input type="checkbox"/> Did not attend to items/no response</p> <p><input type="checkbox"/> Attended to items/no response</p> <p><input type="checkbox"/> Attended to items/response incorrect</p> <p><input type="checkbox"/> Attended to items/response partially correct</p> <p><input type="checkbox"/> Attended to items/response fully correct</p>		

**EMERGENT SET 3
(HS Target EEs)**

Assessment Resources

Formative Assessment: Attributes

[illegible]

Formative Assessment: Composing/Decomposing

[illegible]

Formative Assessment: Part/Whole

[illegible]

Formative Assessment: Patterns

[illegible]

Formative Assessment: Set/Separateness

[illegible]

**EMERGENT SET 3
(HS Target EEs)**

Instructional Resources

Daily Math Routines for Students with Significant Needs

- **Number of the Day:** See Daily Number Sense Routines folders for more information (grades [K-2](#), grades [3-5](#), or grades [6-8](#))
- **K-2**
(https://drive.google.com/drive/folders/1M4fv0245DQyCz-D3RAUez4_bYQiXaixn?usp=sharing)
- **3-5**
(<https://drive.google.com/drive/folders/1w5qR2Fn4WhK7eLUSSLb9LOIX28vqpBBU?usp=sharing>)
- **6-8**
(<https://drive.google.com/drive/folders/1v1F9jzvwG3EvG0B30KcTKz6Dswo14VV2?usp=sharing>)
 - Erickson and Greer's Number of the Day routine using numbers 1-10 should also be used for emergent learners
 - More advanced options exist at higher conventional levels (ex. Multi-digit numbers, fraction of the day, multiplication fact, etc.)
 - You may choose to have a bulletin board for the number of the day containing many representations of the number (ex. Number, written number name, picture collection for number, tallies for number, ten frame representation of number).
 - A daily student job (with associate assistance if needed) could be to help set up the bulletin board for the day's number.
- **Daily/Weekly math vocabulary words:** Bulletin board or poster with name(s) of words, picture representing words, and object/tactile items for words
 - Add student examples of concepts as they are introduced in lesson plans
- **Concept Books:** A short book with interactive manipulatives on each page to represent math concepts. Books are made together with the student.
 - Possible Concepts: Numbers 1-20 with quantities, Soft, Hard, Bumpy, Smooth, Under, Above, In, Out, On, Off, Sizes, Shapes, Colors, Types of money,
 - Time (digital or analog clocks paired with meaningful daily activities)
 - Same/different, More/less
- **Concept Boxes for Emergent Learners and/or Students with Vision Impairments:** A box of several category objects that share similar attributes
 - Examples: balls, brushes, cups, silverware, socks, hygiene routine objects, etc. (Can be any type of item of interest to students.)

- Purpose: explore items that are similar and different, identify attributes of objects, understand functions of objects, understand cause and effect of objects, developing tactile skills
- Adults facilitate exploration of objects and use tactile modeling to teach students how to explore items in the box by using **hand under hand** techniques to invite the student to explore items and their functions.
- Resource on tactile modeling:
<https://documents.nationaldb.org/products/hands.pdf>
- **Individualized, personal schedules for each student:**
 - Personal schedules reinforce important time concepts in meaningful ways (first, next, last, now, later)
 - Representation of activities should vary in format based on student needs (written words, pictures, objects)
 - Format should vary based on student (anticipation schedules in which one item is presented at a time, First/Then schedules, morning/afternoon schedules, full day schedules)
 - Information about calendar systems for students with significant needs including vision impairments can be found at:
 - <https://www.pathstoliteracy.org/blog/calendar-boxes-and-schedule-systems-literacy-tools>
- **Cross-curricular connections:**
 - Incorporate read-alouds of books about math topics:
 - <https://www.mathsthroughstories.org/>
 - Some essential element lesson plans contain links to read alouds
 - YouTube has read aloud versions of many stories
 - Predictable chart writing related to math topics
 - (Ex. I see (shapes), I can buy (items) with coins/bills, At 8:00, I go to (activity), I like to count (items)).
- **Consider purchasing Ten Frame Towers:**



- https://www.amazon.com/Junior-Learning-Frame-Towers-Board/dp/B00B48GJWU/ref=sr_1_2?dchild=1&keywords=numicon+math&qid=1593968383&sr=8-2
 - Ten Frame Towers provide concrete visual and tactile references to sets of

numbers and can be used for a variety of activities (subitizing, matching quantities to numbers on a number line, comparing sets, combining and separating sets).

- Ten Frame Towers can also be used to represent the number of the day.

- **Get students thinking and communicating about math using Same But Different Math:**

- <https://www.samebutdifferentmath.com/>
- This website has a variety of pictures using different levels of math concepts and can be used at all levels.
- Students are shown a picture and tell how the pictures are the same and how they are different.
- This takes about 5 minutes and could be incorporated into an existing routine if needed (ex. morning opening) or could be a math lesson opener.
- **All students** should have opportunities to share and communicate during this activity, even if they use AAC. (Your Speech Language Pathologist can help provide ideas on teaching AAC users core vocabulary related to the concepts).
- Concrete objects or tactile representations may need to be used for students with vision impairments who cannot access pictures of the items.

- **Provide students with daily practice of subitizing** (identifying the number of items in a set by quickly looking at them rather than counting them – knowing without counting).

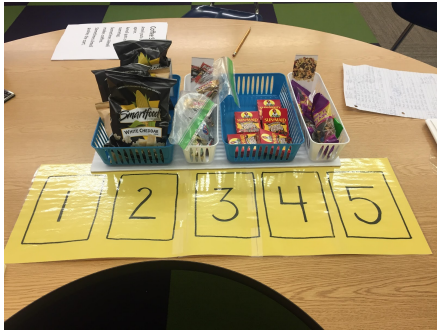
- Resources may include dice, picture cards, dominoes, online videos.
- Video activities:
 - https://www.youtube.com/watch?v=WRg_tGGbR0
 - https://www.youtube.com/watch?v=QPoSv91jXbE&list=PLFZU1Jh8h_T18lOa7466DoYmhbNWolCDB

- **Get students predicting, thinking, and talking using 3-Act Tasks:**

<https://gfletchy.com/3-act-lessons/>.

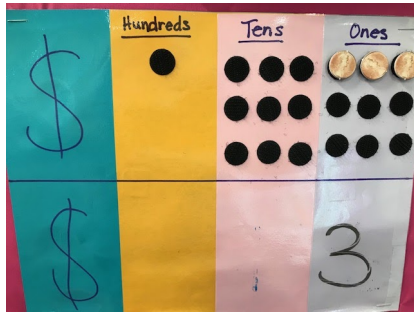
- This website has a variety of videos with linked math concepts and standards in which students notice and predict and then learn more information about a problem in a progression of videos.
- These activities are great to have students participate in with peers.
 - Communication can be prompted using “What do you notice?” or “What do you think?” rather than asking for specific right or wrong answers.

- **Snack Stand:**



- Students help set up each day. Students organize and sort snacks so there are a set number of each per day and help keep track of money earned.
 - This can be placed in the teacher's lounge with prices or students can earn and save money or reinforcement tokens and buy their own snacks from the stand.
- **Mystery Bag:** Have a bag of manipulatives for each student. Each morning there are different items in the bag to count. Students count their items and tell how many there are. You can also talk about who has the most and least.
 - Students may also estimate how many are in the bag by feeling the bag then count to find the actual amount.
 - Students working on more advanced concepts can create story problems using the objects or represent fractions with the objects.
- **Feely Bag (Staves, 2019):** Similar to a mystery bag. Items are placed in the feely bag and students can pull items from the bag to practice math skills in a new and motivating way that creates an element of surprise. Possible items/concepts to place in the Feely Bag:
 - Colors
 - Sizes
 - Shapes
 - Quantities
 - Money
- **Graph/Survey of the Day or Week:** Can fill responses in individually when they get a chance and go over later during math time, or fill them in during math.
 - <https://www.amazon.com/Learning-Resources-Graphing-Flip-Chart/dp/B0013J4C0Q>
 - A similar alternative:
https://www.amazon.com/Write-Wipe-Off-Graphs-Chart-Fill/dp/0439720877/ref=asc_df_0439720877/?tag=hyprod-20&linkCode=df0&hvadid=331954598292&hvpos=1o3&hvnetw=g&hvrnd=8449021042744241003&hvptw

- Days in School Money Chart:** Chart with spot for pennies, dimes, and dollar. Add a penny each day and write days in school as a dollar amount, reinforcing concepts of place value related to money.



- **Any time adults in the classroom can provide modeling of specific quantities, do so.** Try to be intentional about no longer saying **some**. Instead, model discussing specific quantities. (ex. Instead of “Here are some crackers” at snack, say “Here are 3 crackers.”) (Doug Clements, Learning Trajectories).
- **Whenever possible, use visual timers to better help students understand number sense and time** (ex. minutes of free time, minutes until lunch, minutes for snack time, etc.) Many online visual timers can be used such as:
 - <https://www.online-stopwatch.com/classroom-timers/>
 - <https://www.visnos.com/demos/classroom-timer>
- **How Many?**
 - Give students a direction (ex. look up, look down, look left, look right, look at the bulletin board, look at the picture in the book, etc.) and say “How many?” Student shares how many they saw and what they saw.
 - This can be a quick time filler (ex. when waiting on others to transition to a group, while in line, waiting to be dismissed in the lunchroom, etc.).
- For students who are learning cause and effect and working on attending and engaging, **Google Creatability** can be used to make visuals, music, and sound effects using the computer or body motions.
 - <https://experiments.withgoogle.com/collection/creatability>

K-5 Attribute Vocabulary to teach: This will address all of the standards at an emergent level.

Attributes include: quantity, shape, color, size

Begin with attributes that may be more obvious to your student or appropriate for them depending on their challenges. Then move to more abstract attributes.

For example:

- If a student is averse to touching things, start with color, size, and shape versus tactile attributes.
- If a student is visually impaired, avoid color attributes and begin with more tactile attributes like bumpy and smooth.

Specific attributes addressed in the standards include the following:

more/less	same/different	next/past	like/not like	long(er)/short(er)
begin/end	start/end	light/heavy	empty/full/some	tomorrow/yesterday/today
morning/afternoon	day/night	lines/line segments/points	Common Colors - red, blue, green, yellow, white, black, gray, purple, etc.	rough/smooth
big/small	thin/wide	light/dark	on/off	in/out
hard/soft	liquid/solid	wrinkled/smooth	straight/curly	wet/dry
straight/crooked	sticky	front/back	many/few	tiny/huge
straight/curved	round/square	top/bottom	round/square	tall/short

Possible items to use from materials list:

https://dynamiclearningmaps.org/erp_ie/iowa-math

Attributes relating to length, time, capacity and weight will be addressed in other lessons as well. As long as the student has an understanding of attributes, their purpose and is able to perceive those differences and similarities, the remaining attributes can be taught in the context of those specific lessons.

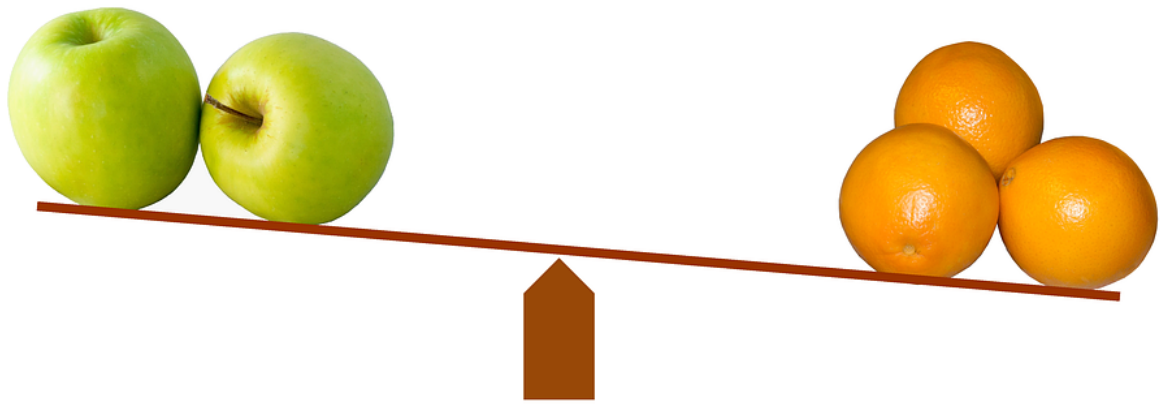
Ideas for Incidental Teaching of Set/Separateness

Options for incidental teaching throughout the day.

Activity	Non-academic	Reading/Science	Math/Science
<i>Use terms such as "Here is some__."</i>	Snack time - "Here are <i>some</i> crackers." *Adult models "some" on Core board or AAC device.	"Here are <i>some</i> letters to sort." *Adult models "some" on Core board or AAC device.	"Here are <i>some</i> blocks to stack." *Adult models "some" on Core board or AAC device.
<i>Counting everything (adult models) including concrete, pictorial and numeral representations</i>	Every time something is handed out to students, adult can count. (ex: pieces of candy, eating utensils, pieces of paper, glue sticks)	Model counting books to read, items in a science collection, items in a picture during shared reading, etc.	Model counting blocks, puzzle pieces, fraction parts, bars on a graph, etc.
<i>Bring attention to groups of items and things that are not part of the group (adult modeling)</i>	Art/Craft time - markers in a box (set) and those that are loose (separate), crayons vs markers vs colored pencils	Sort word patterns such as <i>-at</i> words from <i>-it</i> words, or genres of books	Sort animals and plants into groups or sort math items by purpose (measure weight, length, or temperature)
<i>Sorting activities - use language to describe the sorting process (attributes); (adult modeling)</i>	Clean up time - trash/not trash, spoons/forks, plates/utensils, towels by size, etc.	Sorting tactile letters, books, writing utensils, animals (figurines and pictures), plants, rocks, etc.	Sorting tactile numbers, shapes, colors, math symbols (+, -, x, /, =, <, >),
<i>Create sets in everyday activities (adult modeling)</i>	Sets of eating utensils, snack items, art packages (crayons, paper, glue, and scissors	Sets of writing materials - paper and pencils or reading materials such as a book and a book mark	Sets of things used in an experiment - lab materials like beakers and thermometers
<i>Present a set, label it, count the items, label it again, and encourage the student to use numerals to label and count the separate sets (adult modeling)</i>	Make sets of snack items for other students, outdoor clothing sets, sets of items for swimming time	Count and make sets of book genres or sets of writing materials	Make sets of manipulatives/concrete items to be used during instruction

COMBINE

COMPOSE



Compare



Longer



Shorter

HEAVIER

LIGHTER

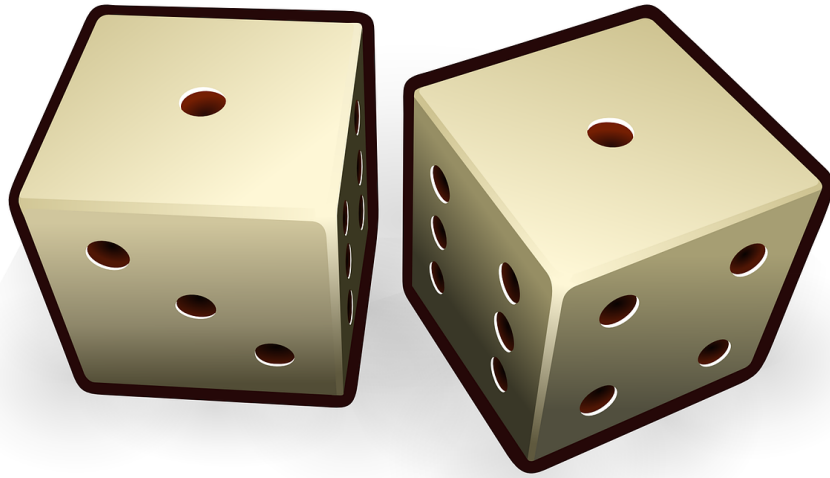
MORE

LESS

SAME

MORE

NOT MORE



PAIR

PARTITION

DECOMPOSE

PART

WHOLE

SEPARATE

SET

SEPARATE

SOME

UNIT



BALL



CLOTHESPIN



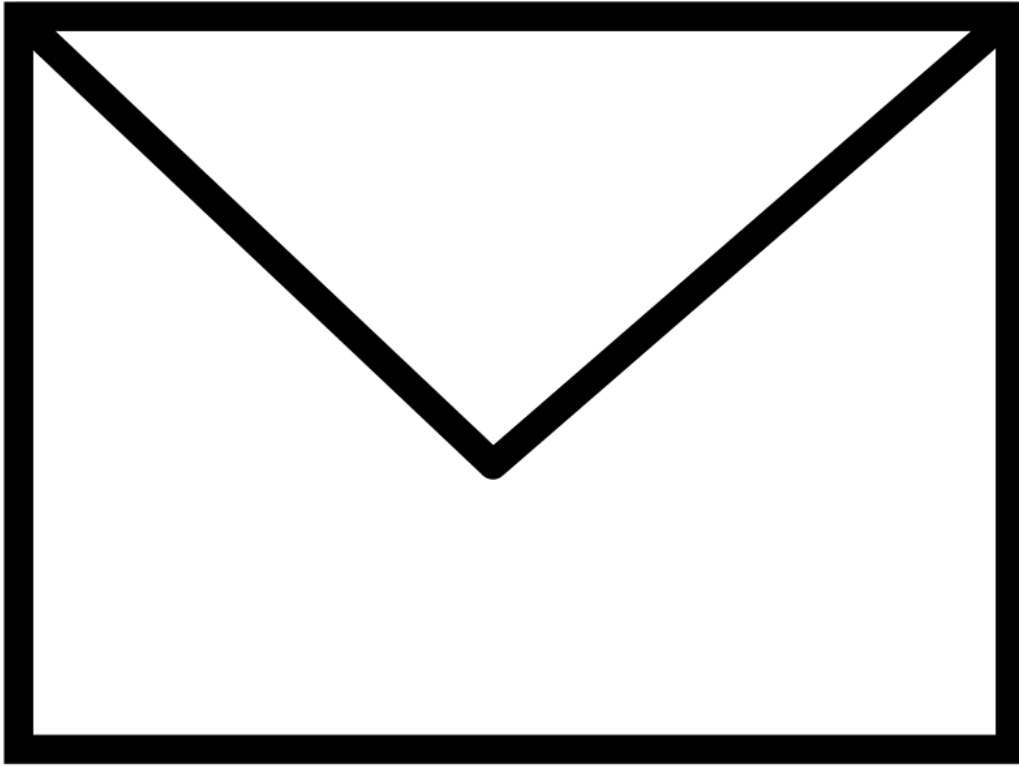
CRAFT STICKS



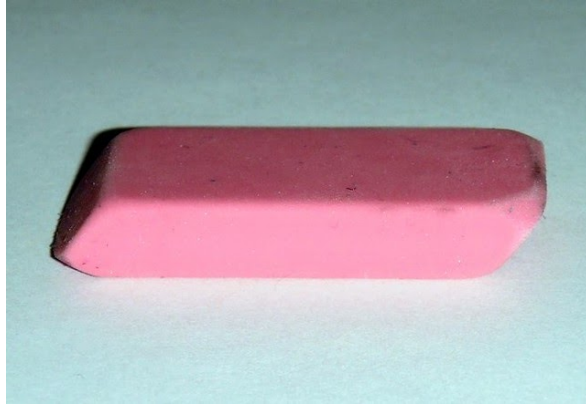
CUBES



CUPS



ENVELOPE



ERASER



HIGHLIGHTER



PAIR

Large

Small

Round

Edges

Rectangular

Red

Hard

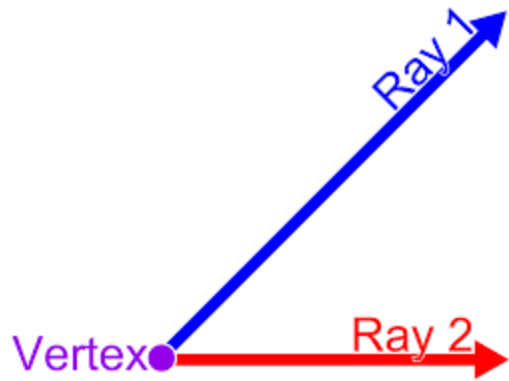
Soft

Blue

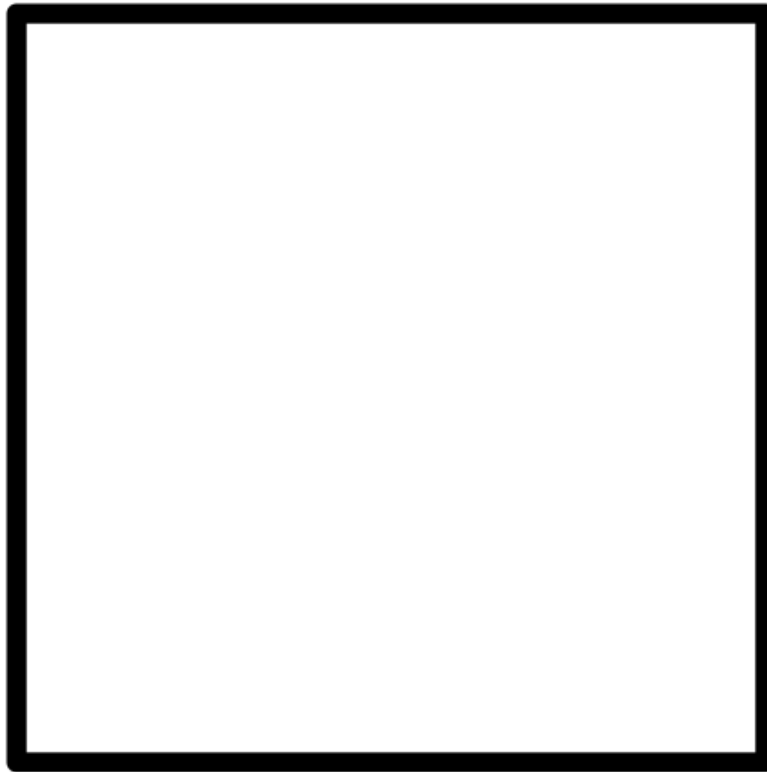
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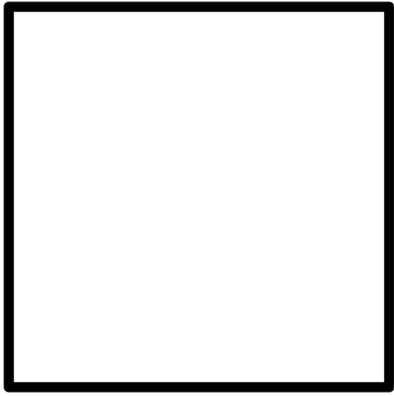
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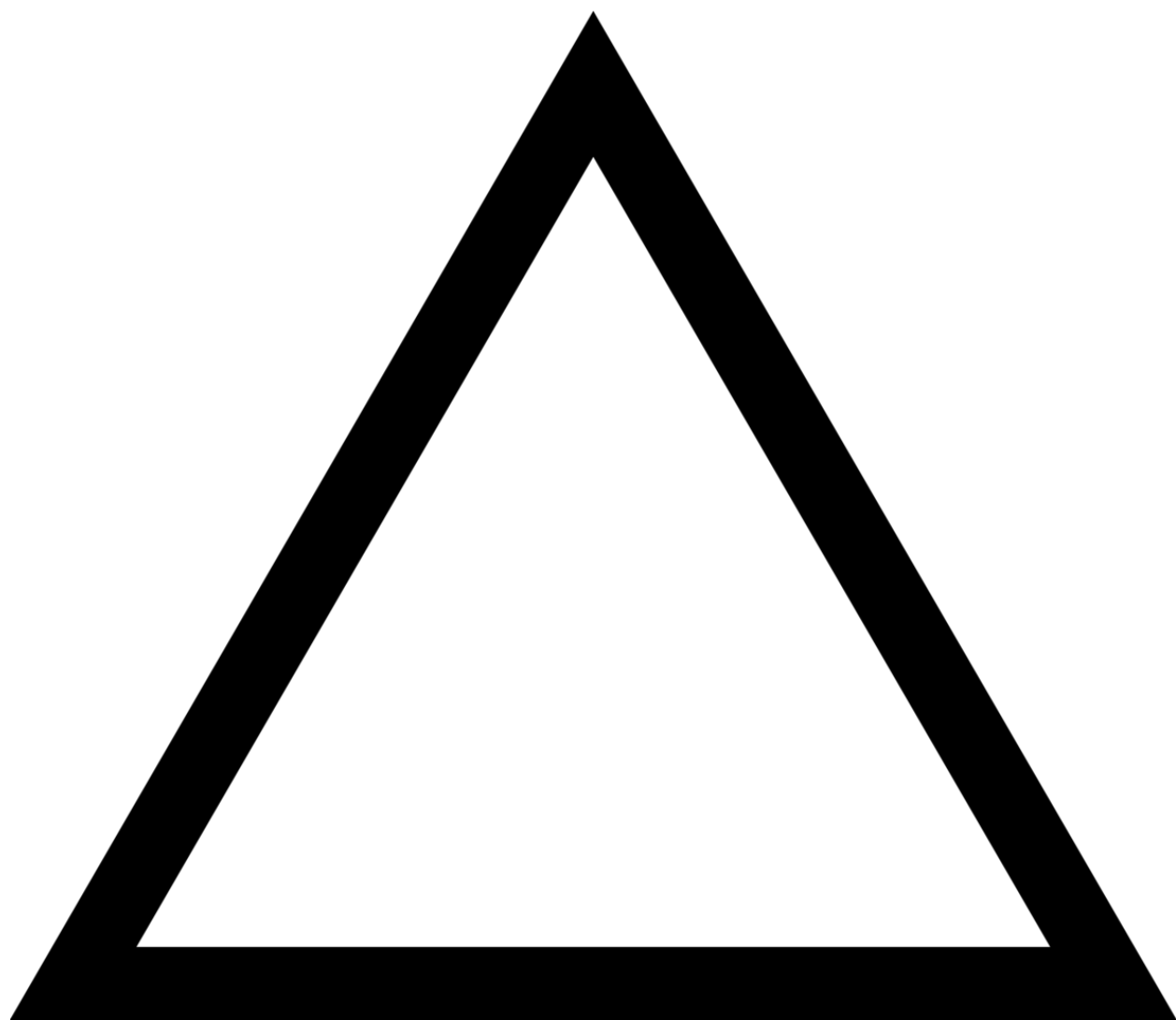
Angle - 2 rays meeting at a common endpoint

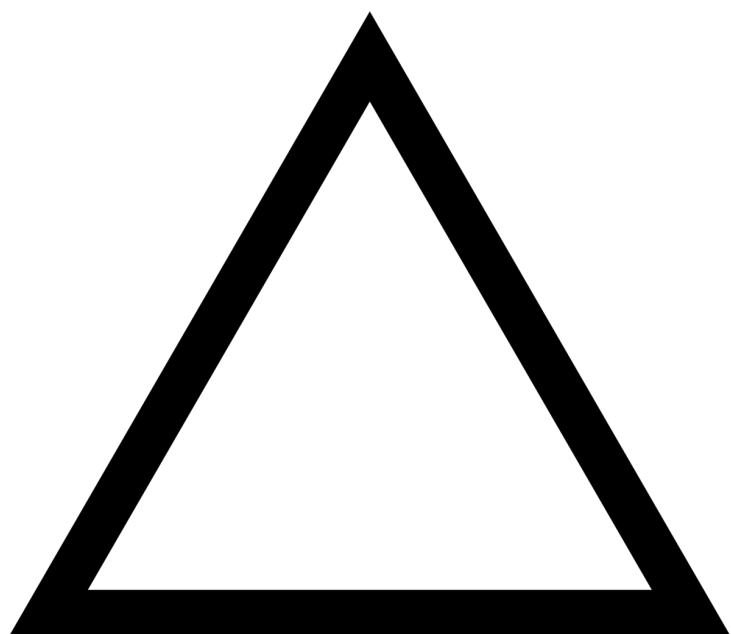


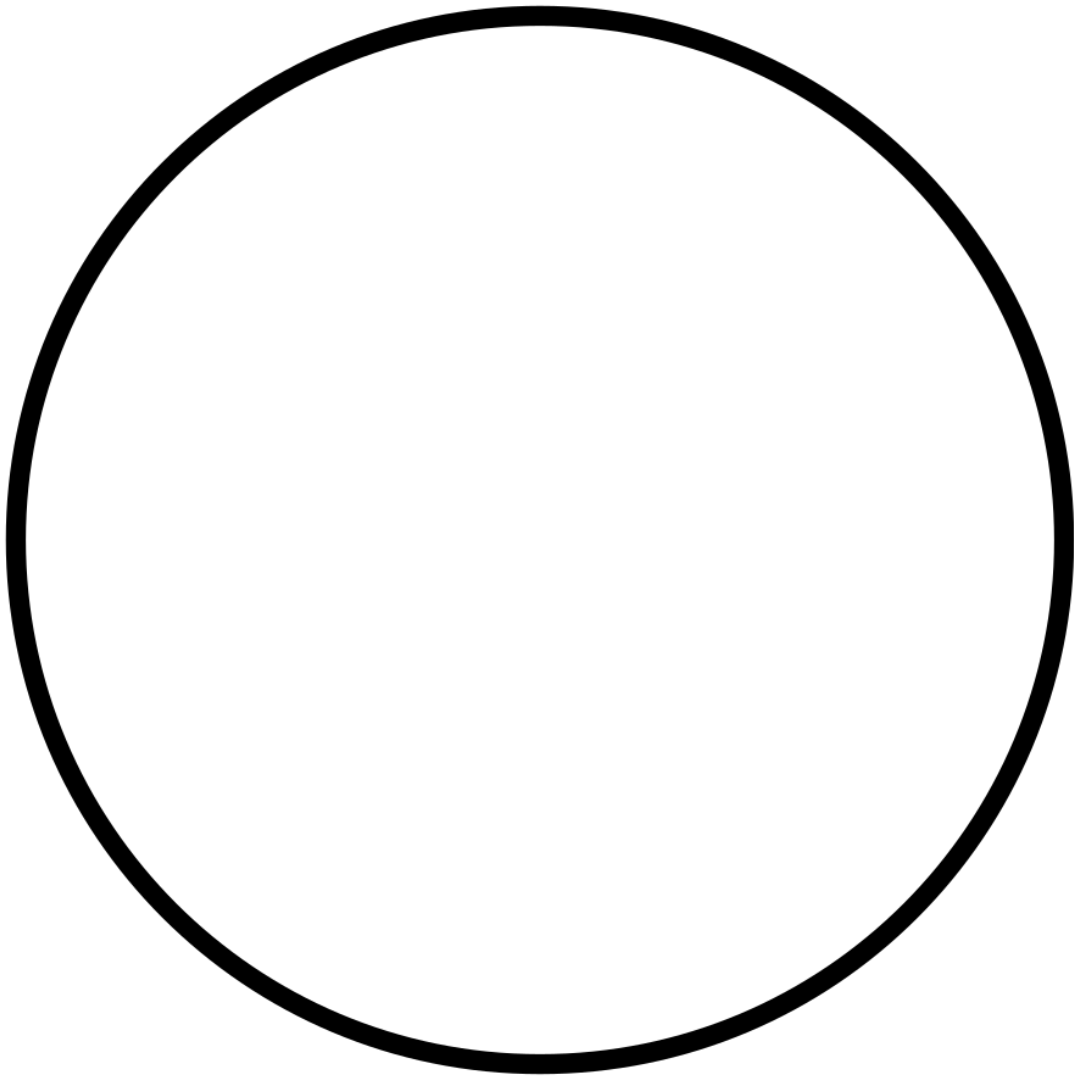
Big/Small Shapes

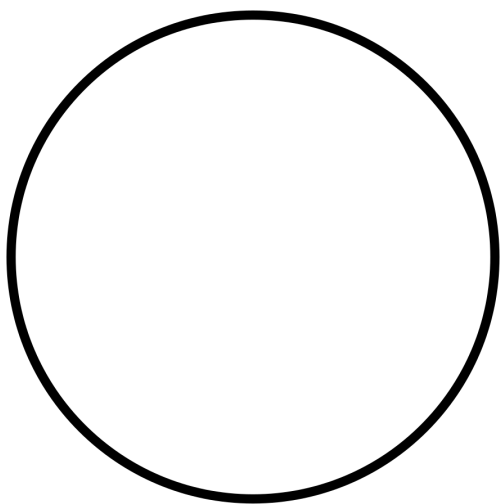




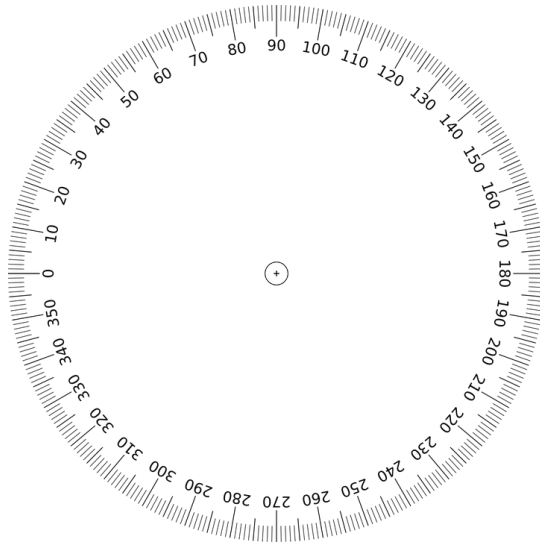
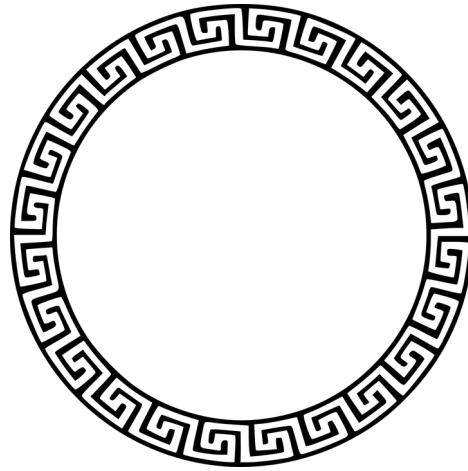
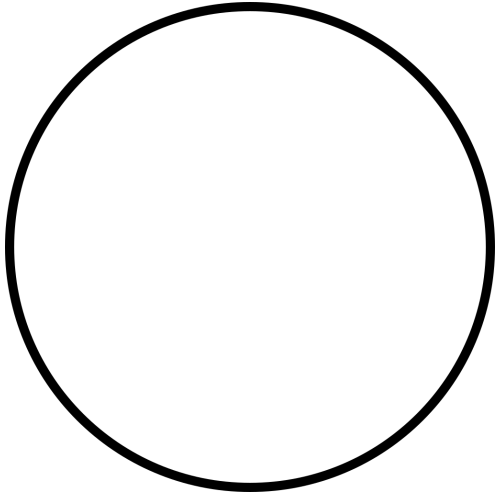


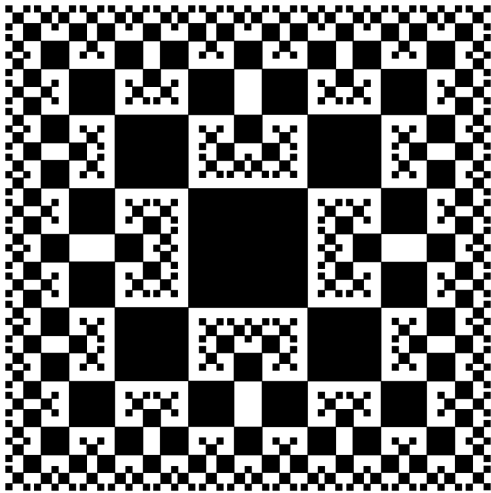
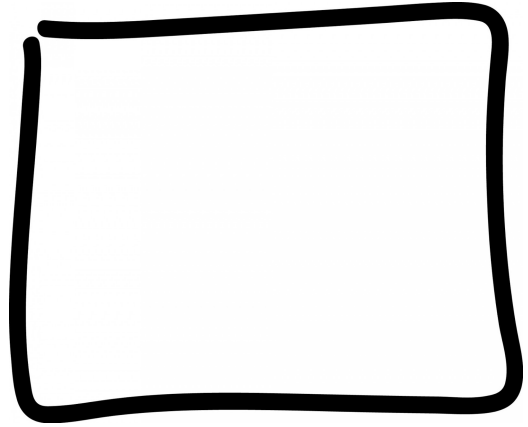
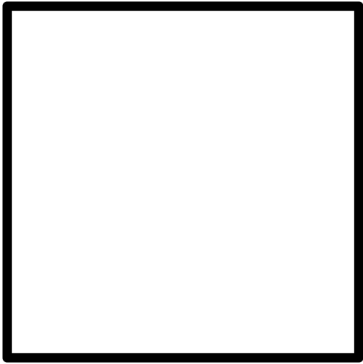


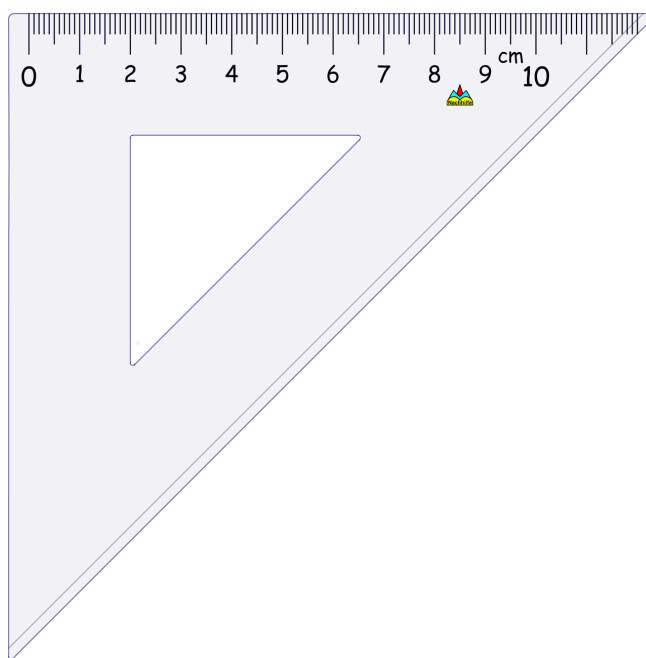
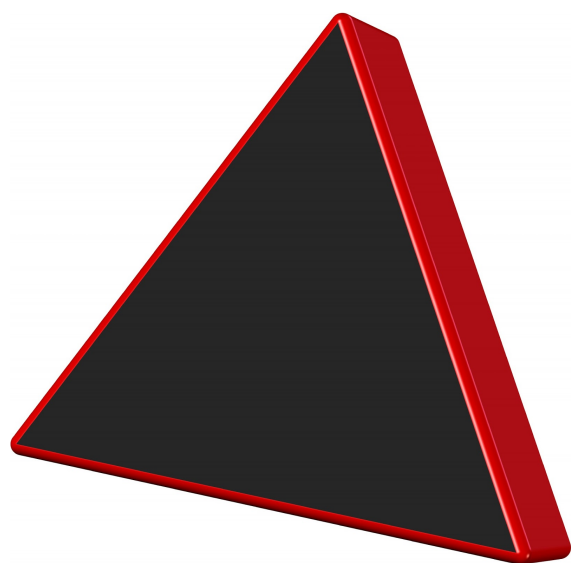
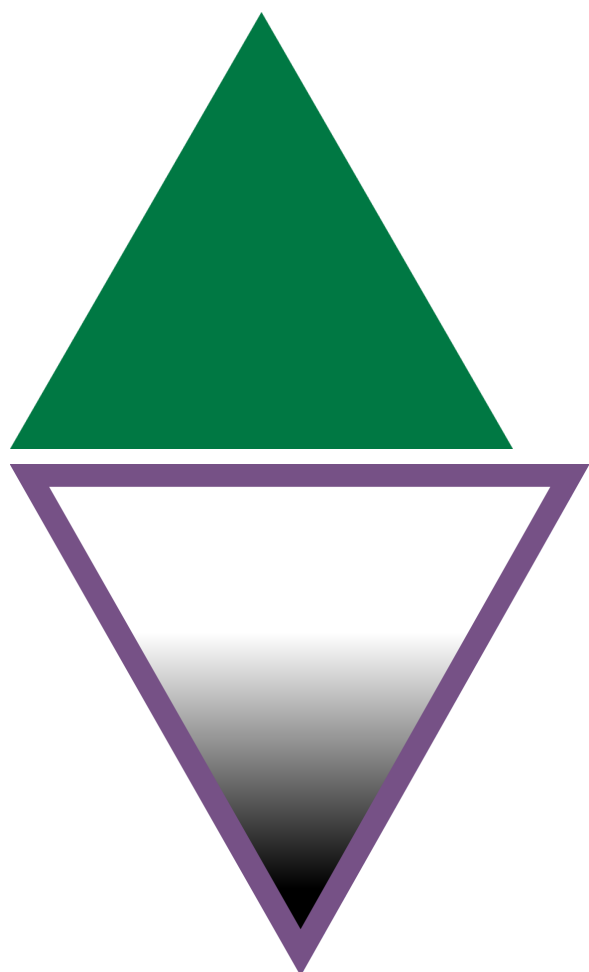




Various Shapes

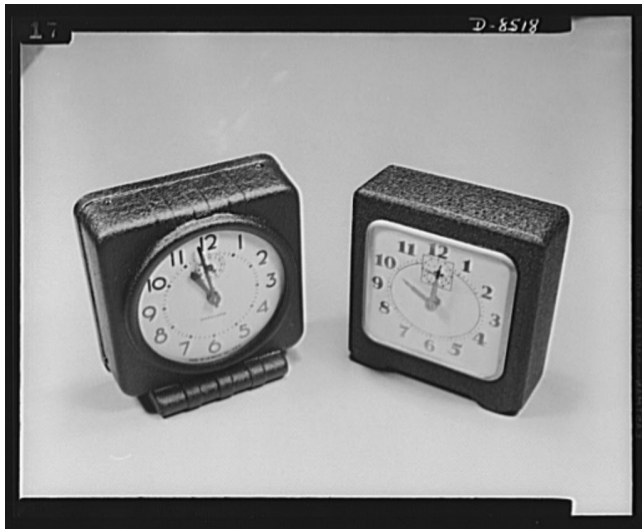














Penny



Nickel



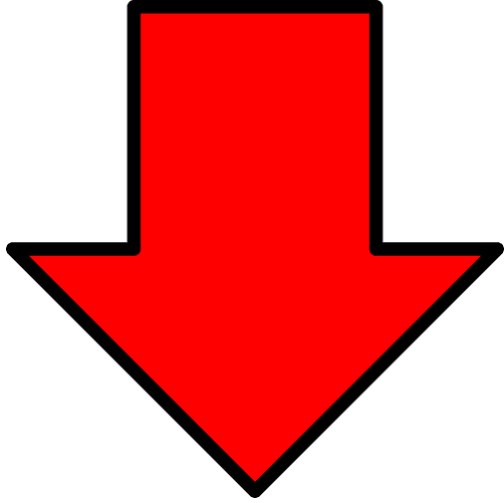
Dime



Quarter



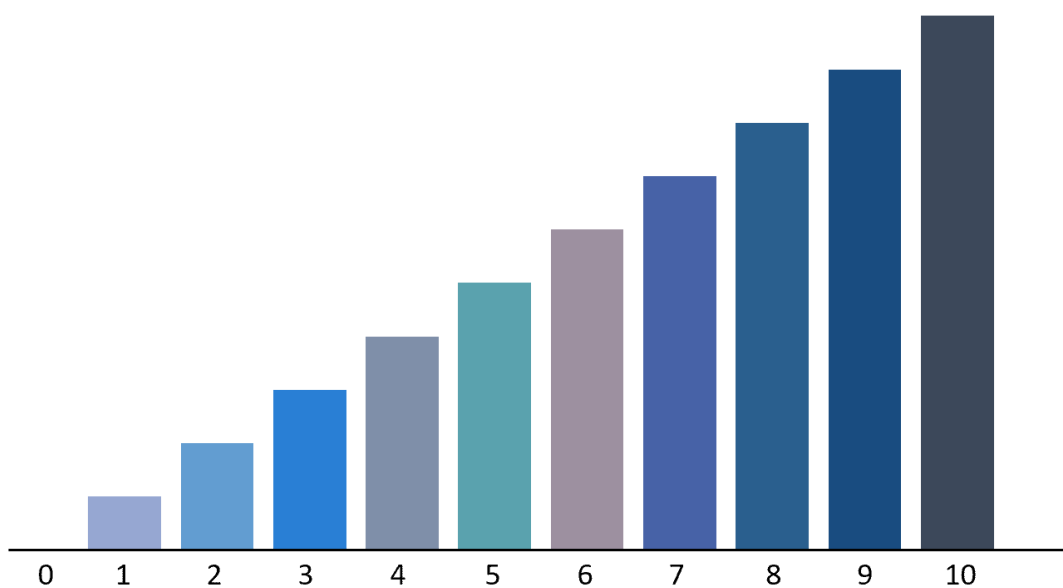
UP



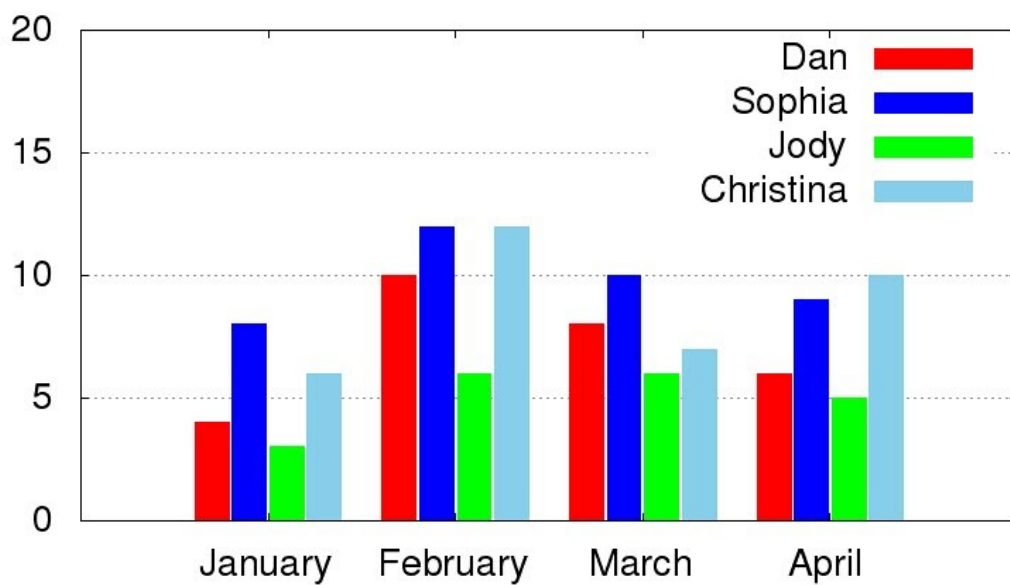
NOT UP

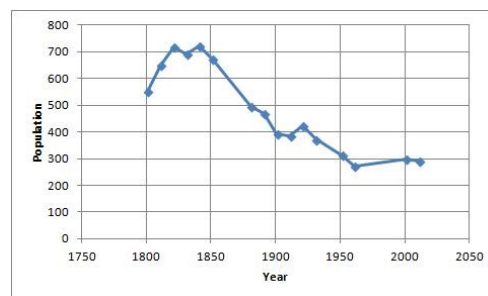
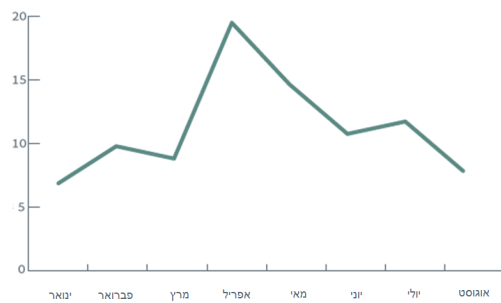
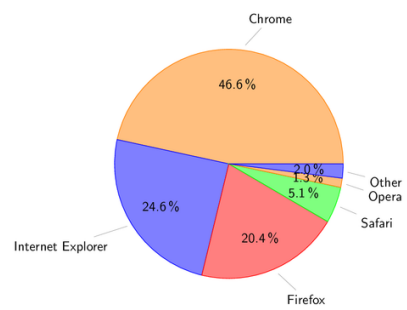
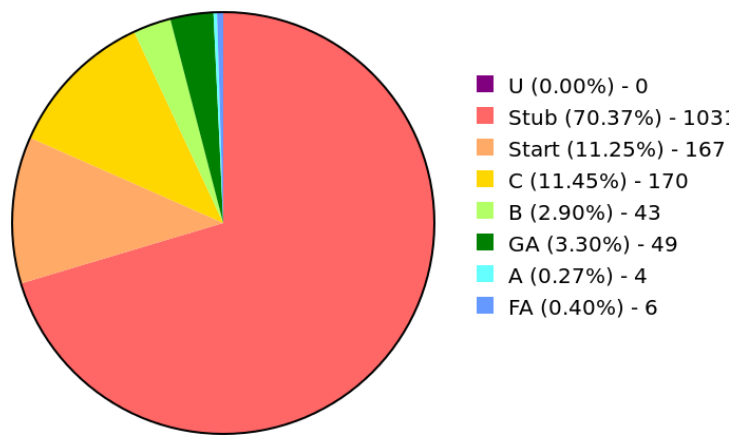
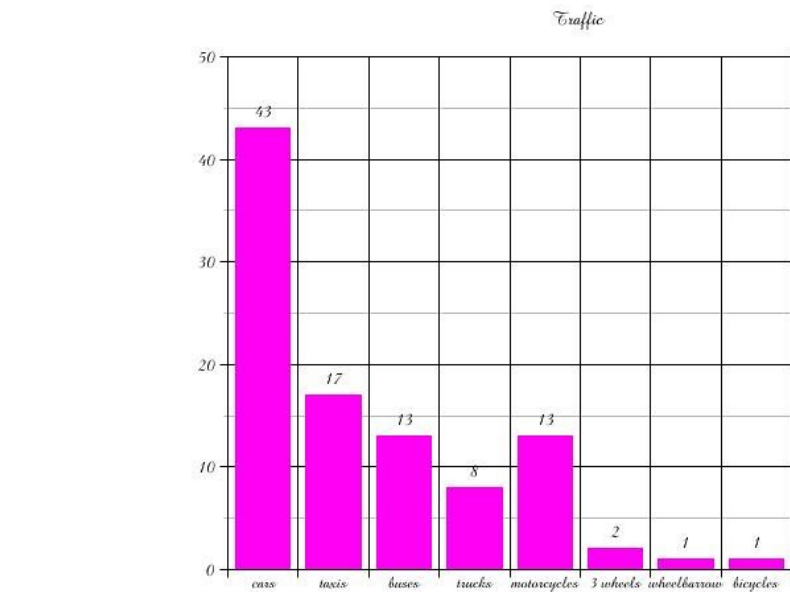
SAME













Bar Graph/Picture Graph or Not?





































A Sample Bar Chart



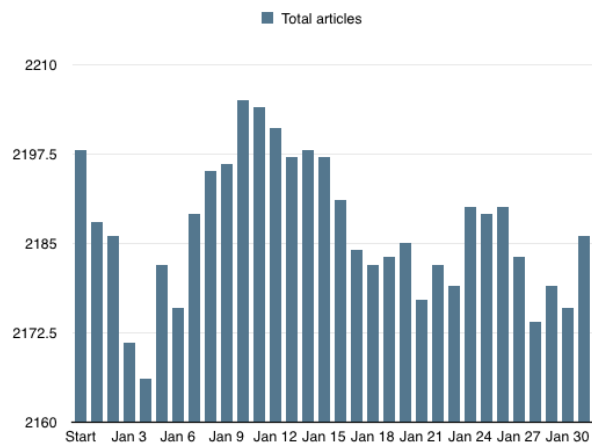
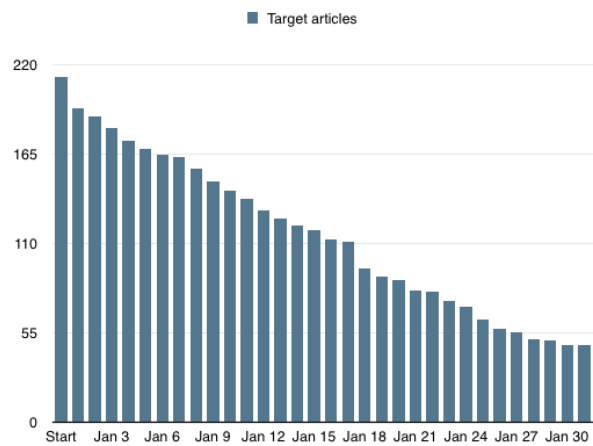


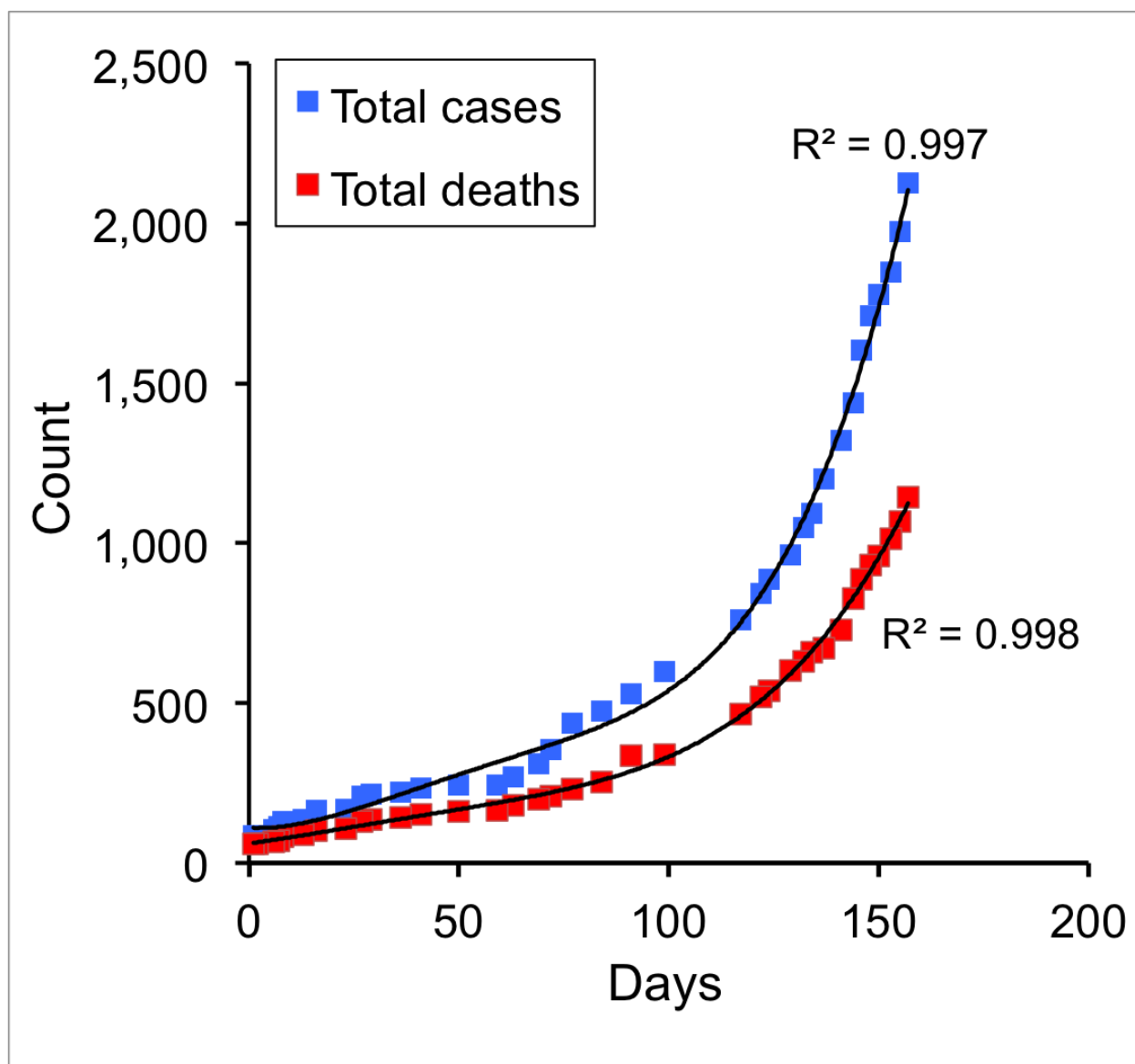
Fruit Collected	
Banana	   
Apple	   
Cherry	   

FRUIT	NUMBER OF CHILDREN WHO CHOSE IT
PEAR	      
WATERMELON	
ORANGE	
APPLE	
BANANA	

Days	Number of Red-Boxes Sold
Monday	   
Tuesday	 
Wednesday	  
Thursday	    
Friday	       
Saturday	

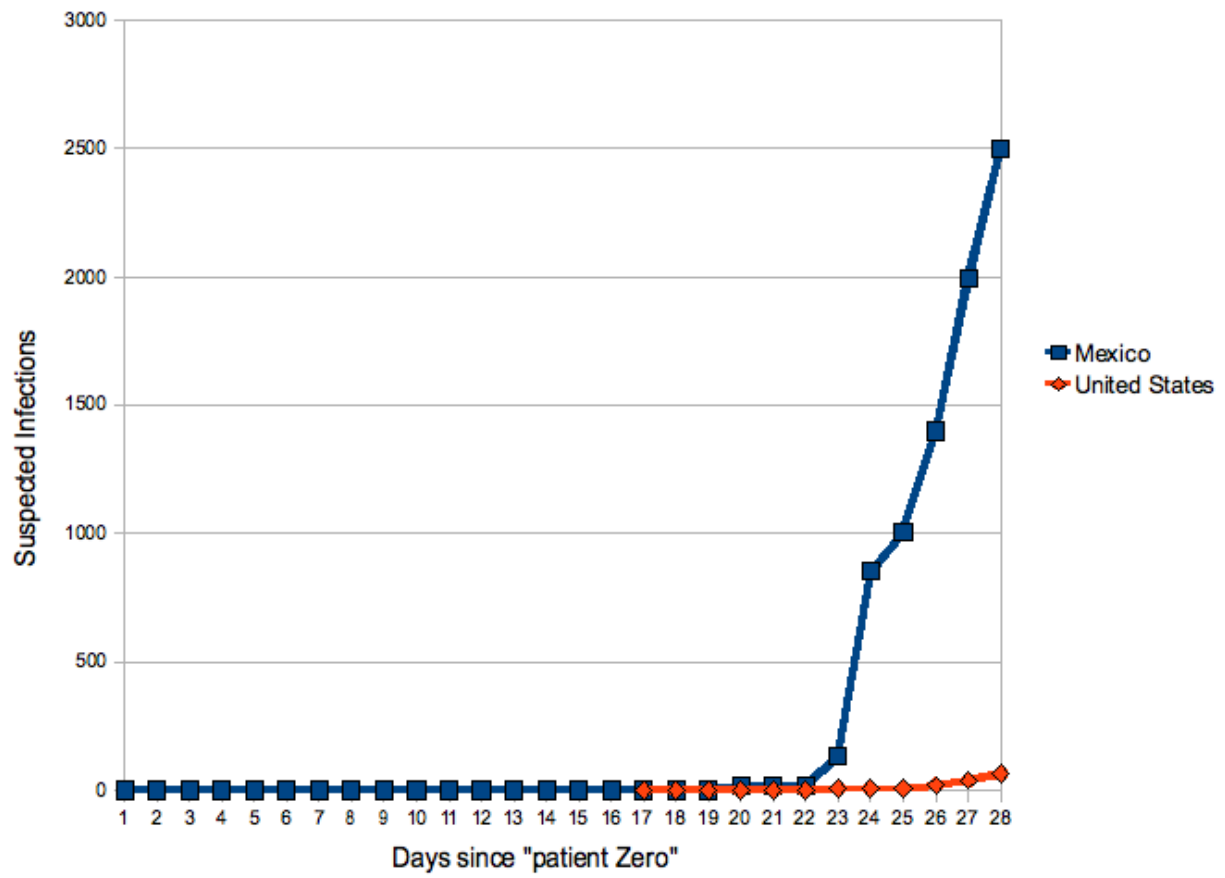
Example Graphs

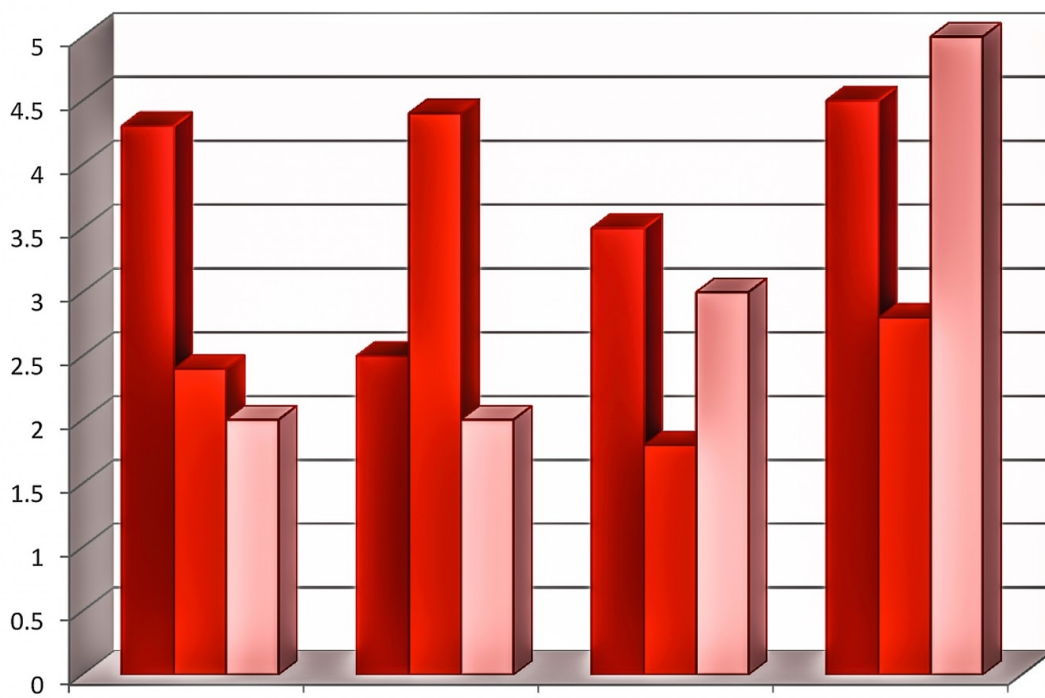


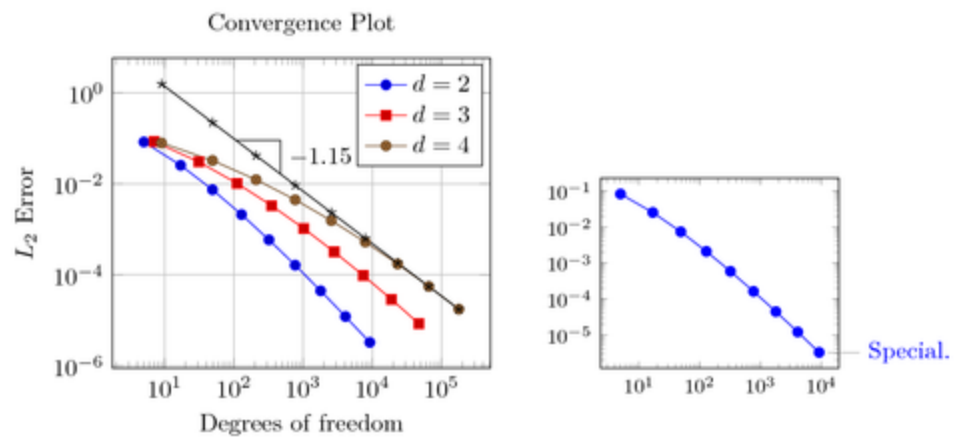
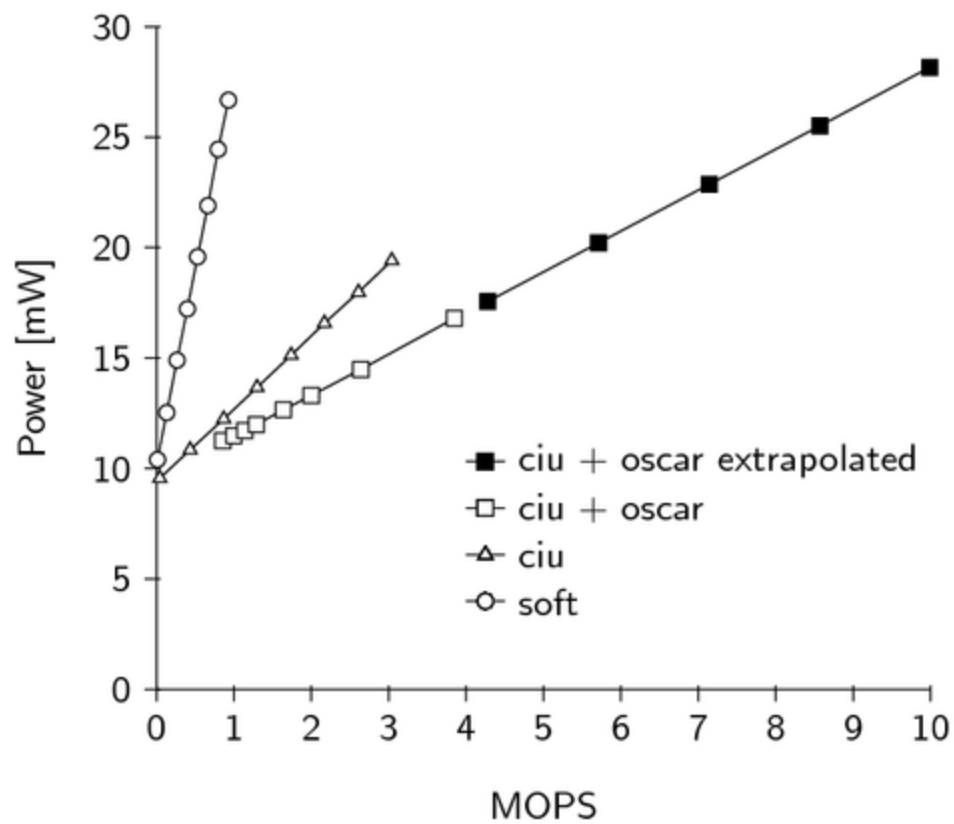


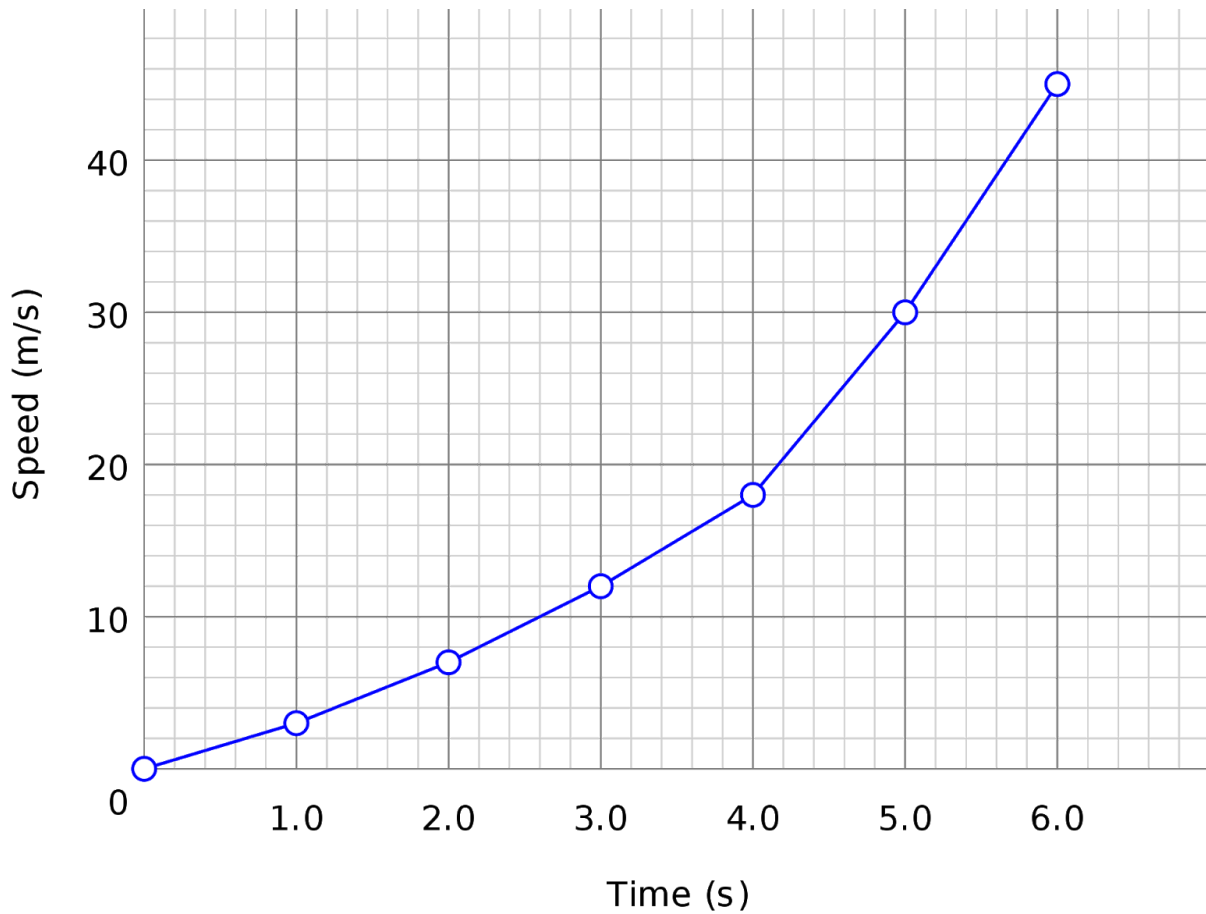
Suspected Swine Flu Infections

(as of 04/28/09)









3rd Grade Mathematics

The tally chart below shows the favorite sports of Ms. Lyle's students.

Complete the picture graph that represents the data.

FAVORITE SPORTS	
Sport	Number of Students
Baseball	
Basketball	I
Hockey	
Football	
Soccer	

FAVORITE SPORTS

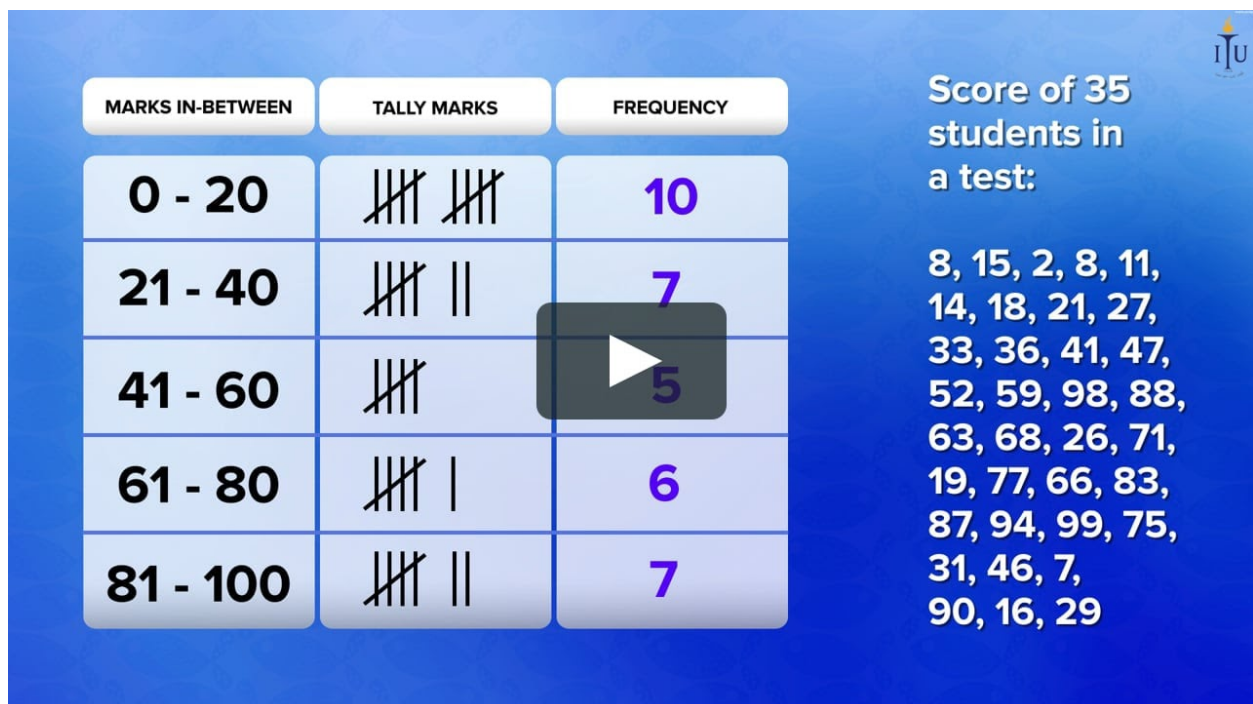
Sport	Number of Students
Baseball	★★★★
Basketball	★★★★★★
Hockey	★★
Football	★★★★★
Soccer	★★★★★★★★

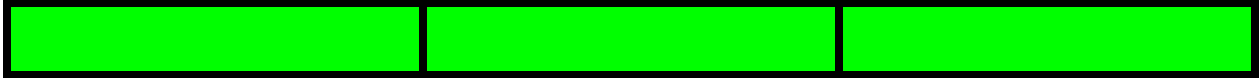
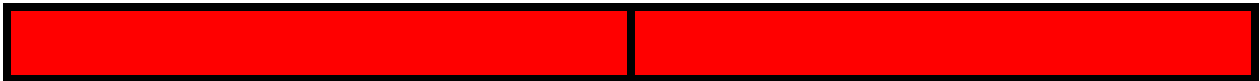
Paint Job Quality Control Checklist

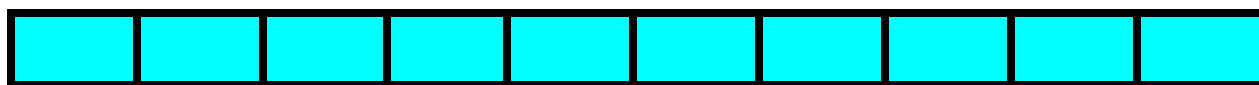
Job: 629555

Inspector: Al Kyder

Problem	Frequency
Chip	
Bubble	
Run	
Scrape or scratch	
Inadequate coverage	
Other	







ANGLE	NOT an ANGLE

CIRCLE	NOT a CIRCLE

CONE	NOT a CONE

CUBE	NOT a CUBE

CYLINDER	NOT a CYLINDER

RECTANGLE	NOT a RECTANGLE

SPHERE	NOT a SPHERE

SQUARE	NOT a SQUARE

TRIANGLE	NOT a TRIANGLE

YES	NO

YES

NO

YES

NO

YES

NO

Blank Ordered Pairs Table

Input	Rule	Output

Blank T-Chart

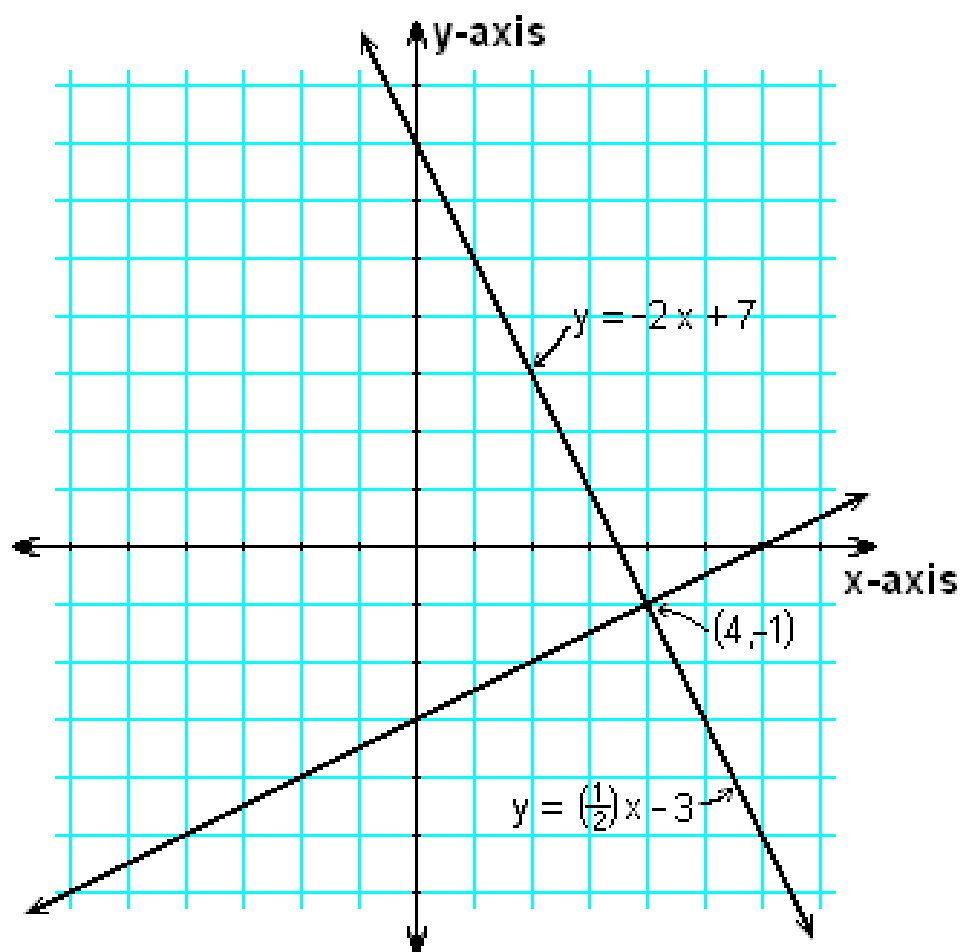
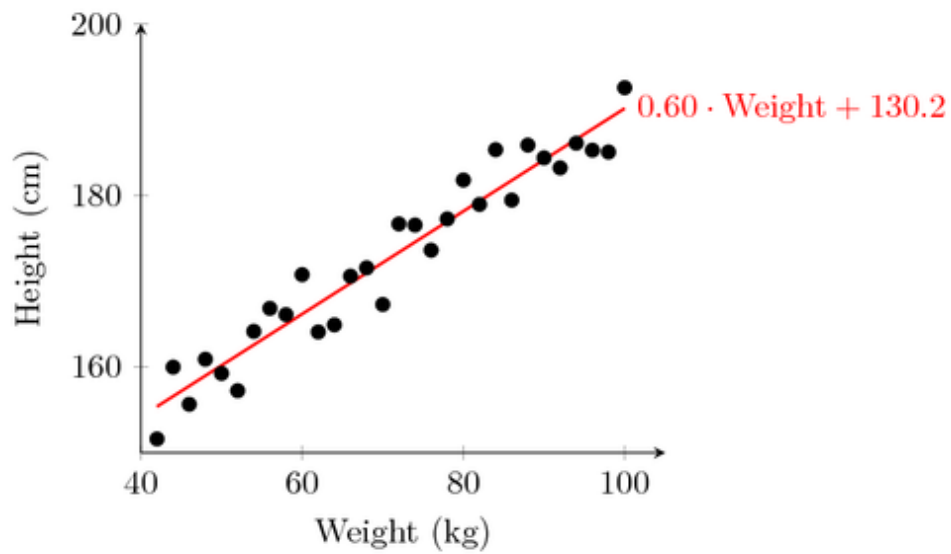
Coordinates T-Chart

X	Y

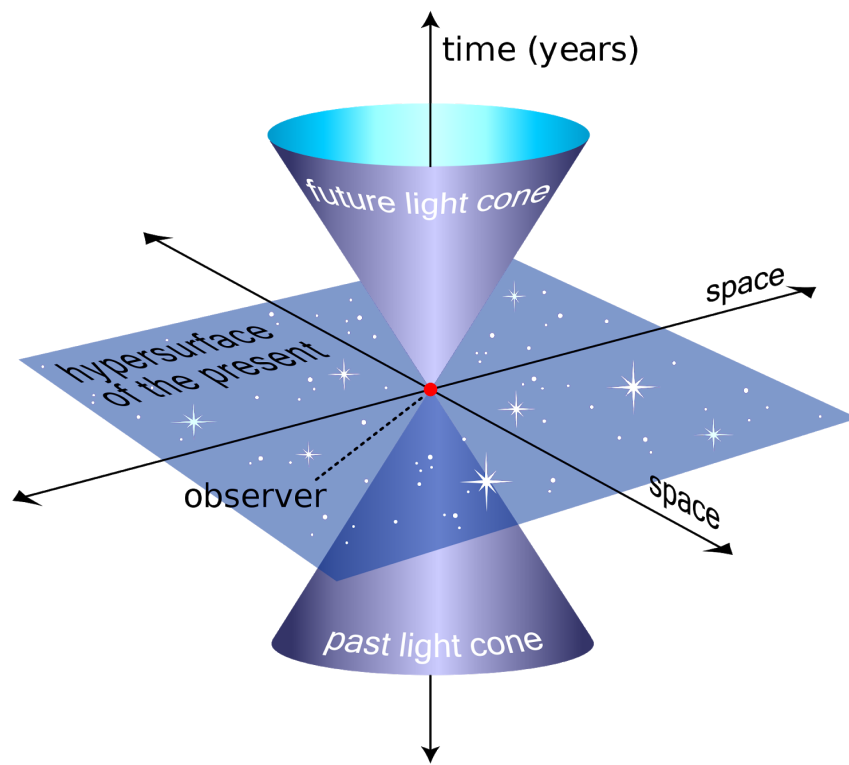
Repeated Addition Mat

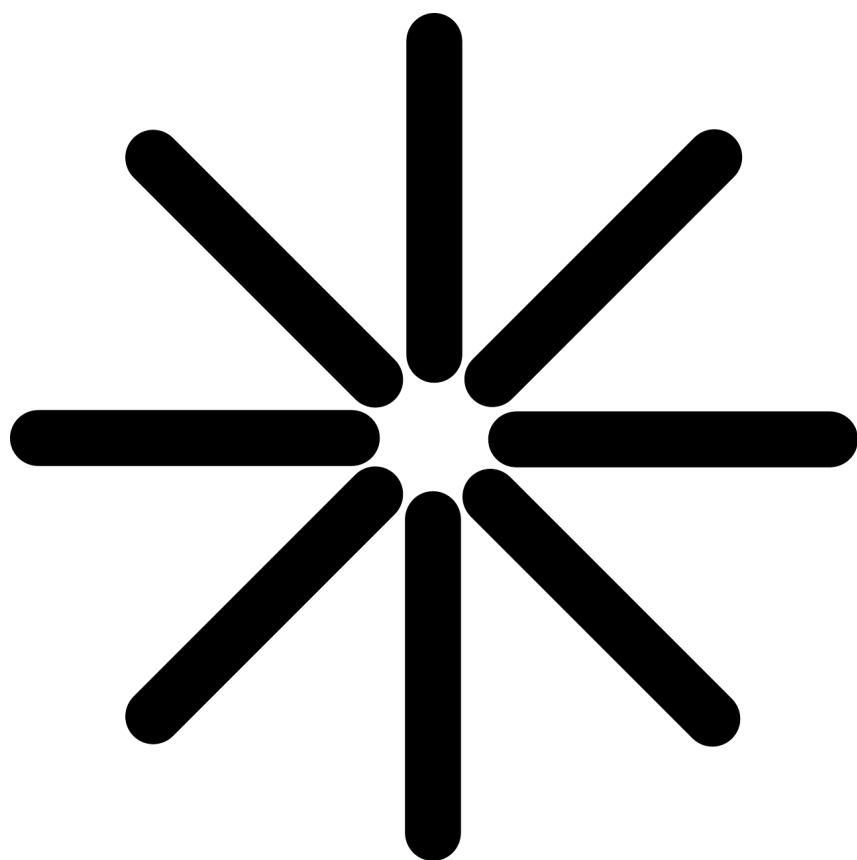
Sorting Mat

Is it a Line, Ray or Point?

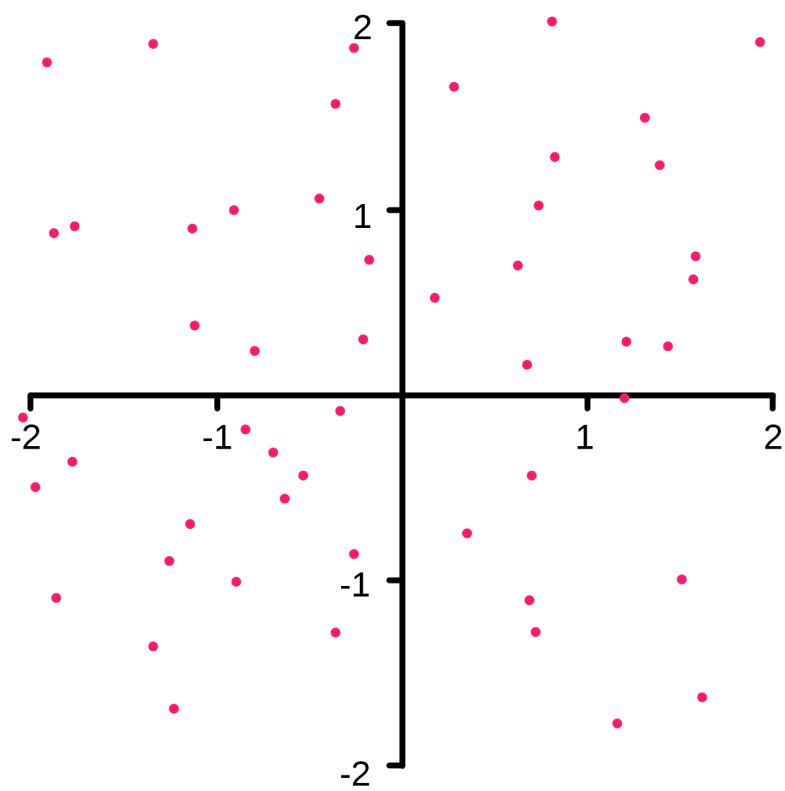


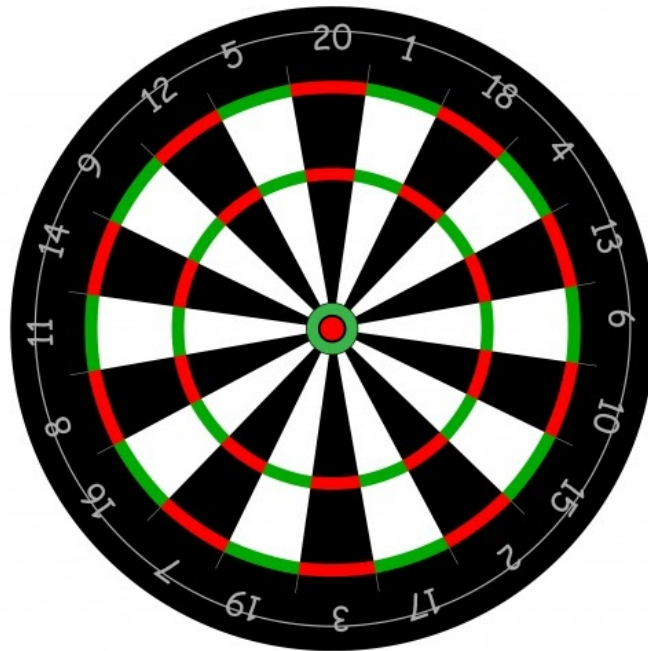
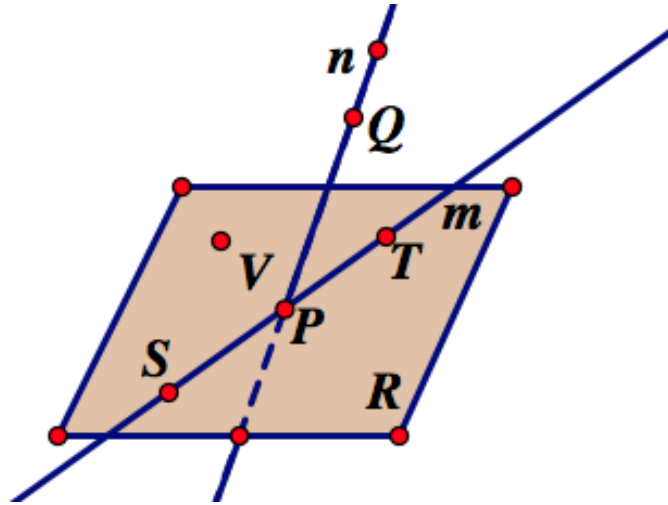




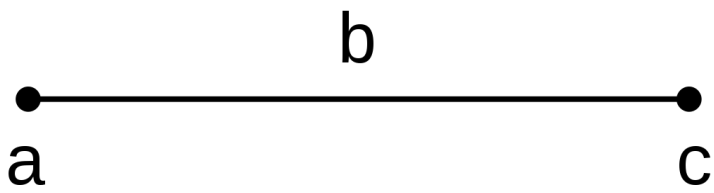
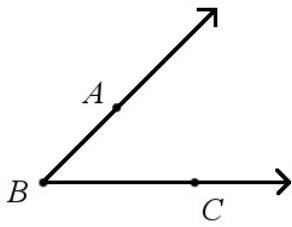
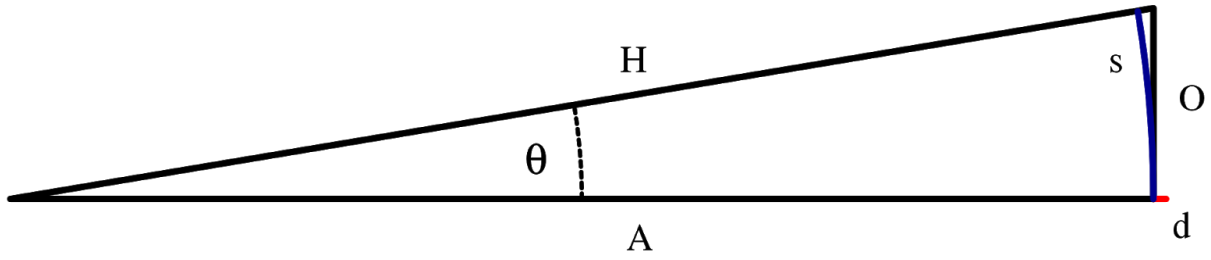


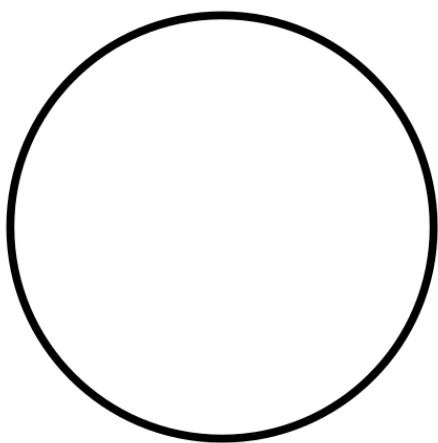
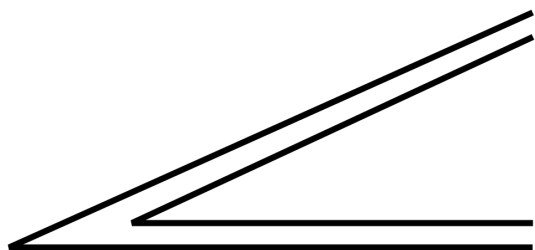


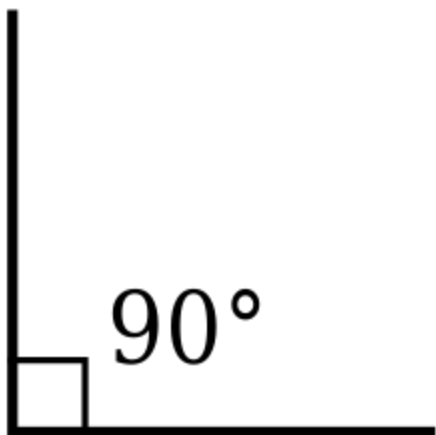




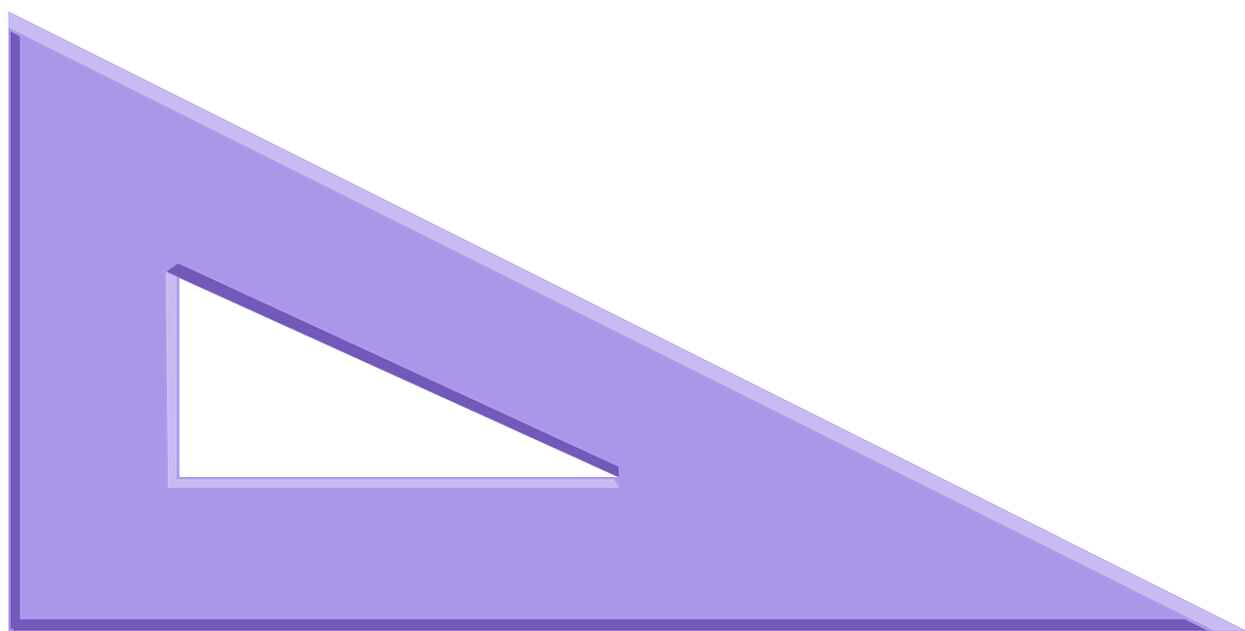
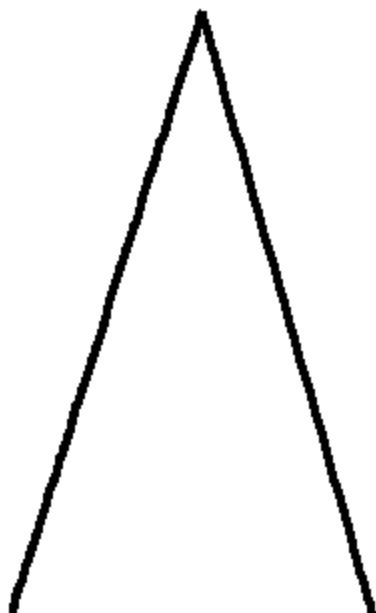
Is it an Angle?



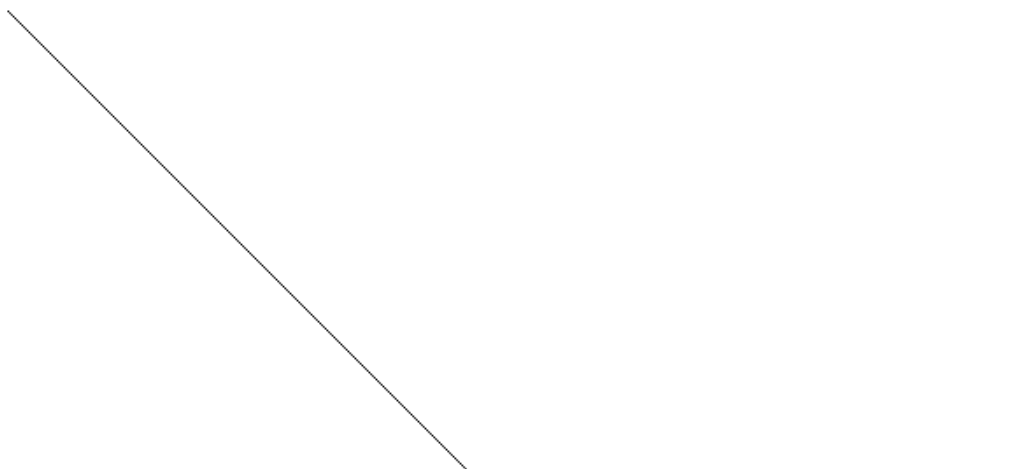






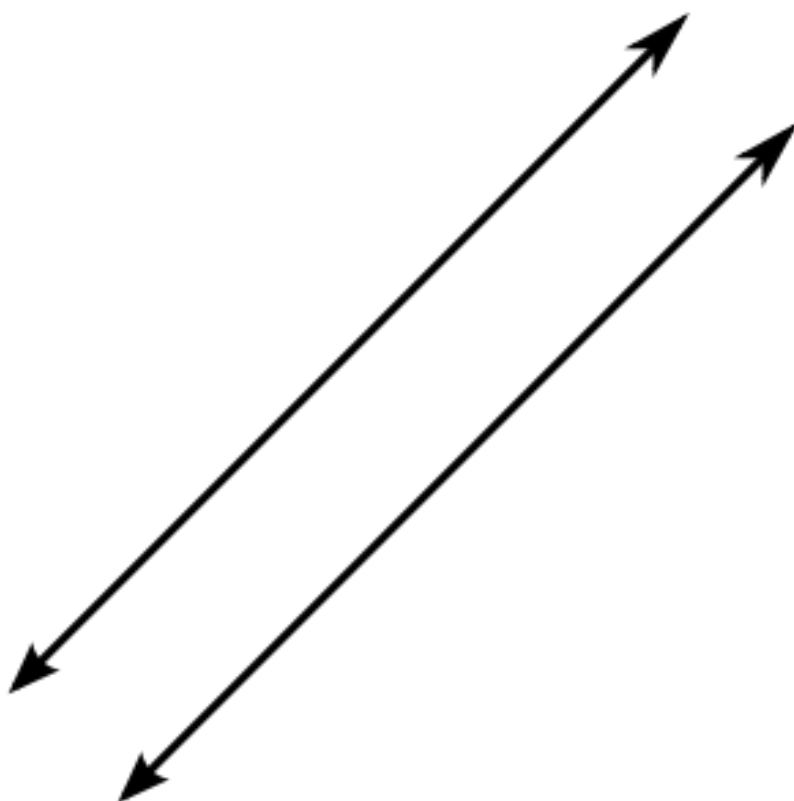


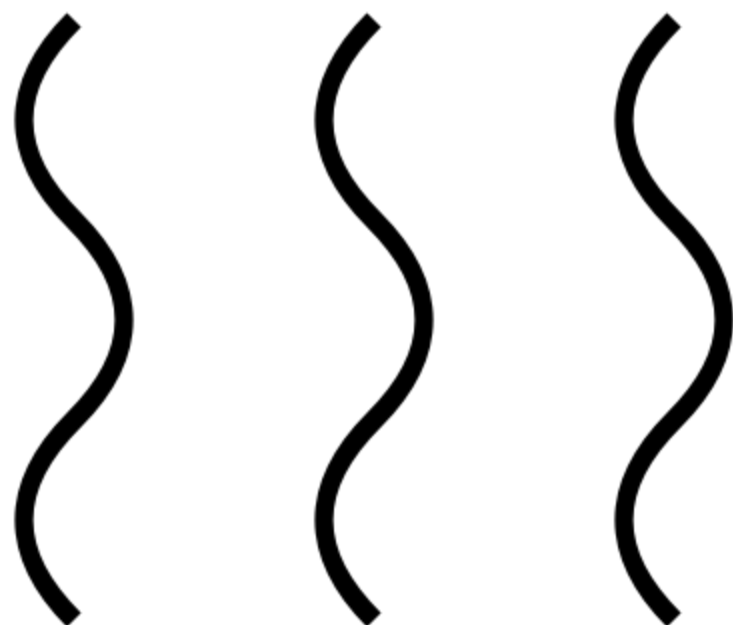






Lines with Points





[REDACTED]

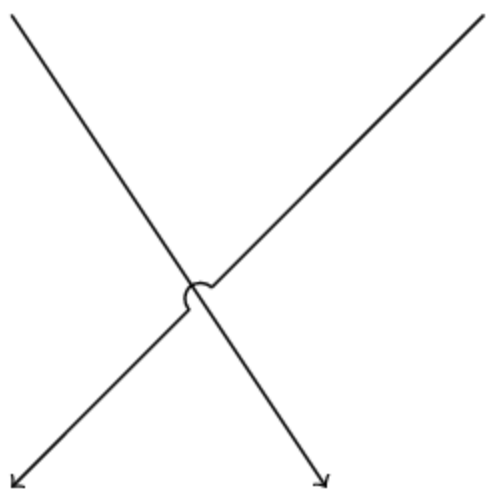
[REDACTED]

[REDACTED]

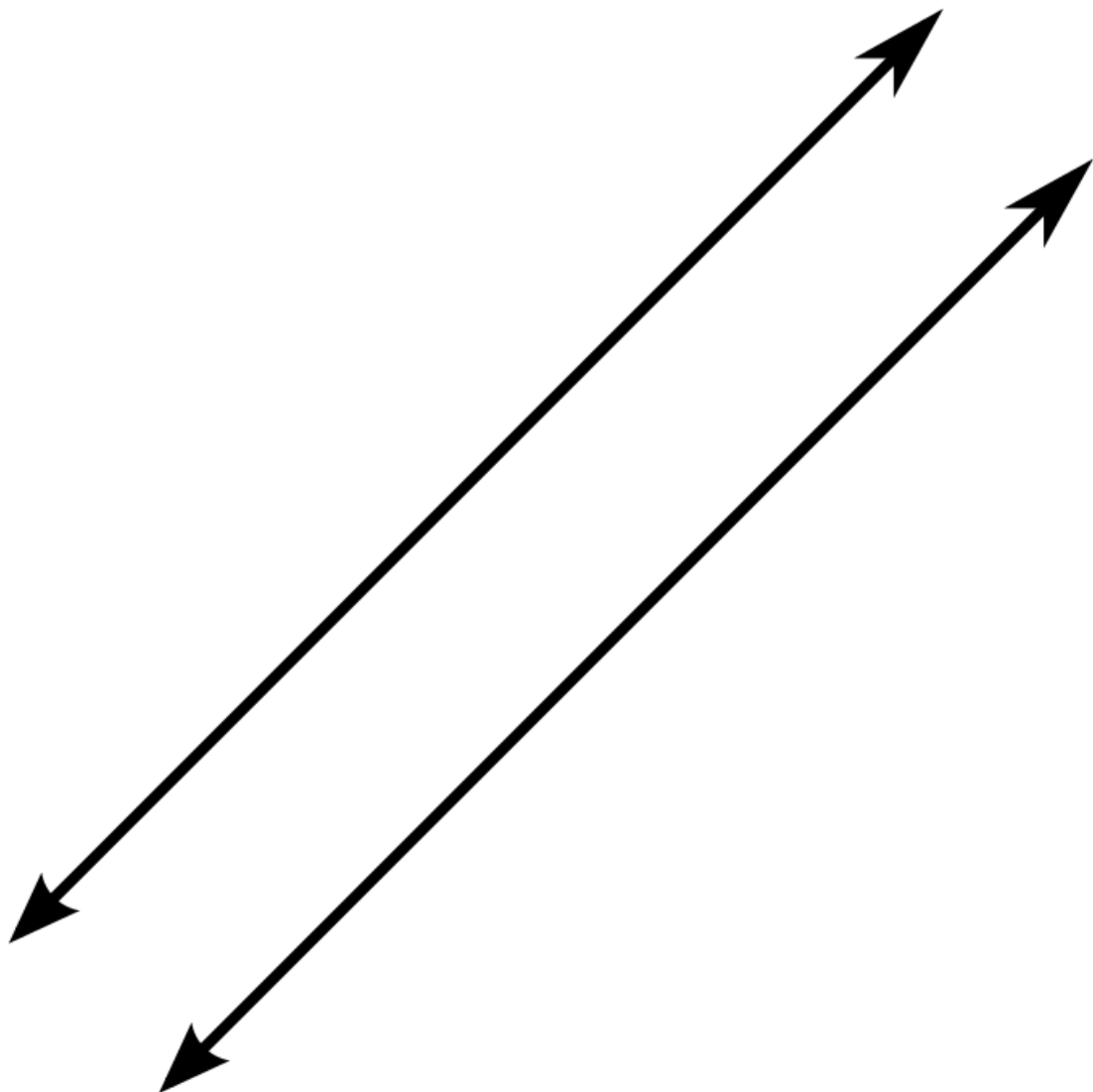
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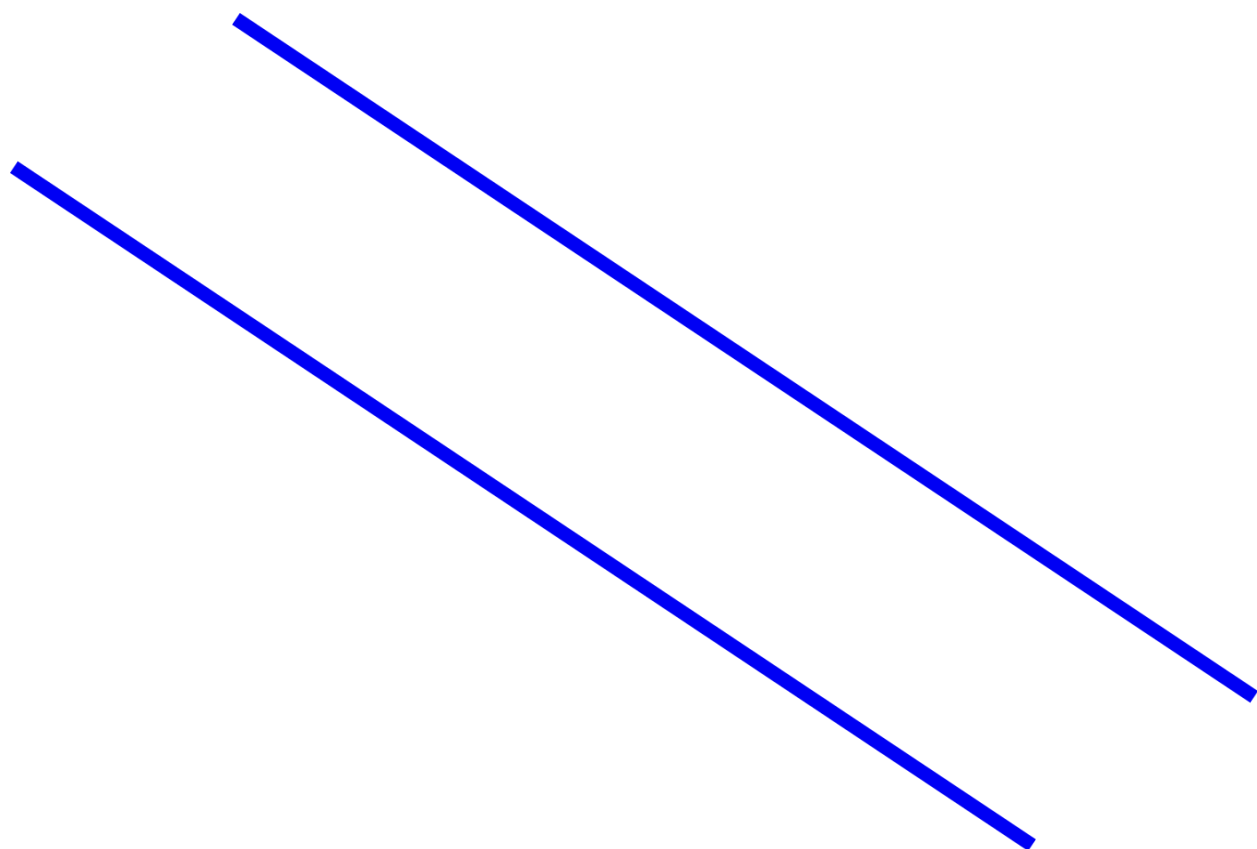
[REDACTED]



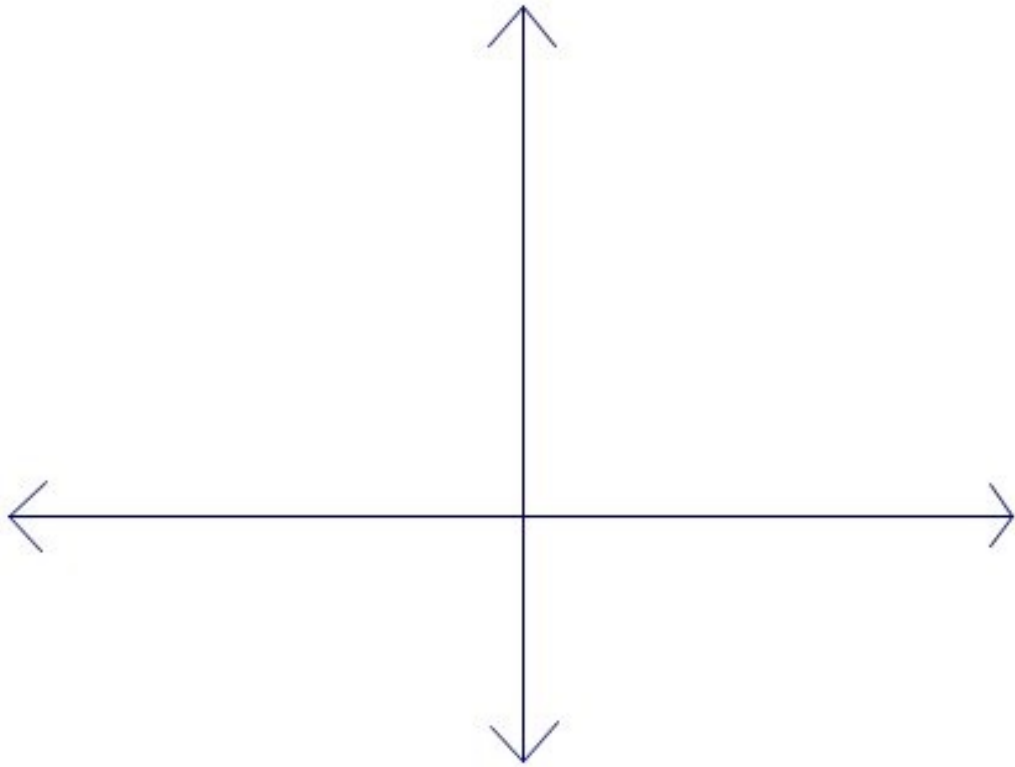


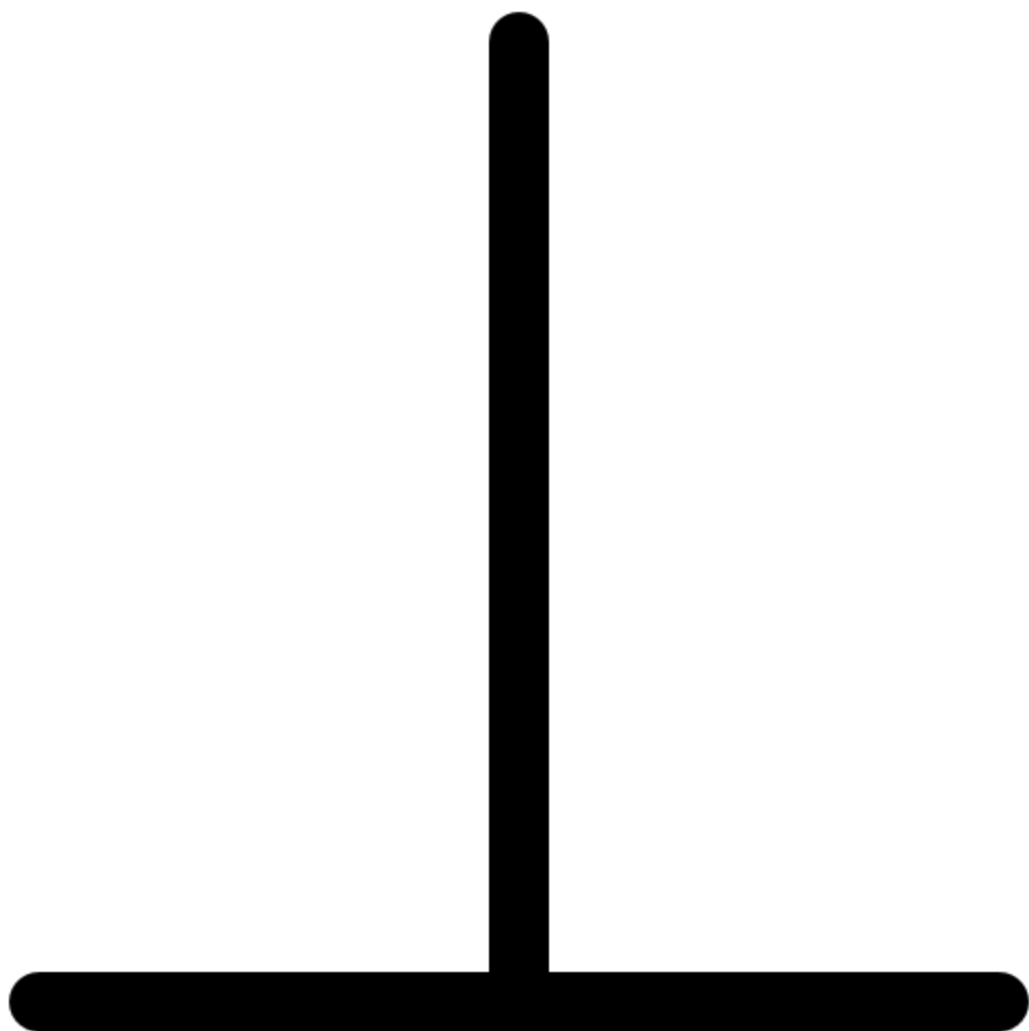
Parallel Lines Cards





Perpendicular Lines Cards

















Links for Core Vocabulary Information and Resources

Universal Core Communication Systems

<http://www.project-core.com/communication-systems/>

Texts Resources

<https://www.dlmpd.com/texts-resources/>

List of Materials

Items below can be used with the above lesson routines.

Collections List found here: https://dynamiclearningmaps.org/erp_ie/iowa-math

Non-vision impaired list

- 2-16-count boxes of crayons
- 2-identical puzzles with 4 or more pieces
- 6 Markers with caps
- 5 erasers
- 5 pencils
- 6 folders
- 6 glue sticks
- 6 index cards
- 7 chenille sticks
- 8 paint brushes
- 1 rubber band (or piece of string)
- 2-identical 12 count boxes of colored pencils
- 2-identical 12 count boxes of pencils
- 2 plastic resealable bags in varying size
- 6 paper clips
- 6 socks
- 7 buttons
- 7 checkers
- 2-identical 12 count packs of pens
- 5 plates
- 5 spoons
- 6 envelopes
- 9 connecting blocks

Vision impaired list

- 1 tactile material to make groups
- 2 sets of objects (1 whole and 2 parts)
- Variety of containers that have separate compartments

Name : _____

Score : _____

Teacher : _____

Date : _____

Word Problems

- 1) Nancy went to the mall on Saturday to buy clothes. She spent \$4.43 on shorts and \$11.03 on a shirt. In total, how much money did Nancy spend on clothing? _____
- 2) Tom joined his school's band. He bought a viola for \$147.02, and a song book which was \$11.33. How much did Tom spend at the music store? _____
- 3) Jessica spent \$10.97 on a gerbil toy, and a cage cost her \$12.09. What was the total cost of Jessica's purchases? _____
- 4) For her car, Sara spent \$148.76 on speakers and \$115.32 on new tires. In total, how much did Sara spend on car parts? _____
- 5) On Wednesday, Mary spent \$10.09 each on two tickets to a movie theater. She also borrowed a movie for \$4.94. How much money in total did Mary spend on movies? _____
- 6) Benny loves trading cards. She bought 3 packs of Digimon cards for \$2.93 each, and a deck of football cards for \$8.96. How much did Benny spend on cards? _____
- 7) Melanie purchased a Superman game for \$7.34, and a Spiderman game for \$11.64. How much did Melanie spend on video games? _____
- 8) Mary loves eating fruits. Mary paid \$14.51 for berries, and \$7.94 for bananas. In total, how much money did Mary spend? _____
- 9) Joan bought some toys. She bought a baseball for \$10.72, and spent \$13.50 on toy cars. In total, how much did Joan spend on toys? _____
- 10) Alyssa got fast food for lunch. Alyssa spent \$3.12 on soup and \$5.13 on a hotdog. What was the total of the lunch bill? _____



Name : _____

Score : _____

Teacher : _____

Date : _____

Word Problems

- 1) Nancy went to the mall on Saturday to buy clothes. She spent \$4.43 on shorts and \$11.03 on a shirt. In total, how much money did Nancy spend on clothing? \$15.46
- 2) Tom joined his school's band. He bought a viola for \$147.02, and a song book which was \$11.33. How much did Tom spend at the music store? \$158.35
- 3) Jessica spent \$10.97 on a gerbil toy, and a cage cost her \$12.09. What was the total cost of Jessica's purchases? \$23.06
- 4) For her car, Sara spent \$148.76 on speakers and \$115.32 on new tires. In total, how much did Sara spend on car parts? \$264.08
- 5) On Wednesday, Mary spent \$10.09 each on two tickets to a movie theater. She also borrowed a movie for \$4.94. How much money in total did Mary spend on movies? \$25.12
- 6) Benny loves trading cards. She bought 3 packs of Digimon cards for \$2.93 each, and a deck of football cards for \$8.96. How much did Benny spend on cards? \$17.75
- 7) Melanie purchased a Superman game for \$7.34, and a Spiderman game for \$11.64. How much did Melanie spend on video games? \$18.98
- 8) Mary loves eating fruits. Mary paid \$14.51 for berries, and \$7.94 for bananas. In total, how much money did Mary spend? \$22.45
- 9) Joan bought some toys. She bought a baseball for \$10.72, and spent \$13.50 on toy cars. In total, how much did Joan spend on toys? \$24.22
- 10) Alyssa got fast food for lunch. Alyssa spent \$3.12 on soup and \$5.13 on a hotdog. What was the total of the lunch bill? \$8.25



Number and Letter Resources

https://www.discountschoolsupply.com/stem-curriculum/language-literacy/letters-number/s/ezread--plastic-magnetic-letters-----expanded/p/s710744?es=237530000ESC&gclid=EAlaIQobChMlis23_Kvh6gIViYbACh0gHwP-EAQYBCABEgKxcfD_BwE

<https://www.amazon.com/Imaginarium-Letters-Numbers-72-Pieces/dp/B002JWOKF8>

Number Line Access Resources

Printable Number Line: 0 to 20

<https://www.helpingwithmath.com/printables/others/lin0301number02.htm>

You may also use:

- Yard/meter stick
- Tape measure
- https://www.amazon.com/Learning-Resources-Number-Counting-Blocks/dp/B01MS1JKPE?ref=fscpl_dp_13
- https://www.target.com/p/50-piece-wooden-numbers-wood-craft-number-blocks-with-storage-tray-set-for-kids-toddlers-learning-toys-home-decor-multicolored-1-3-inch/-/A-80405665?ref=tgt_adv_XS0000000&AFID=google_pla_df&fndsrc=tgtao&CPNG=PLA_Toys%2BShopping&adgroup=SC_Toys&LID=700000001170770pgs&network=g&device=c&location=9017921&ds_rl=1246978&ds_rl=1248099&gclid=EAlaIQobChMI46C-qPvg6glVB9bACh3H7w3zEAQYDSABEgl0ZfD_BwE&gclsrc=aw.ds

Survey Questions to Get You Started

This list is meant to get you started in developing surveys your students can complete with their peers. This is a great opportunity for them to practice their speech and social skills in preparation for making a graph.

- **What is your favorite snack?** Chips, fruit, popcorn, candy
- **Which sport do you like?** Football, Soccer, Basketball
- **What kind of books do you like to read?** Fiction, Nonfiction
- **What kind of movies do you like?** Scary movies, Funny movies, Sad movies, Animal movies
- **Which subject do you like best?** Reading, writing, math, science, social studies, art, music, PE
- **What is your favorite pet animal?** Dog, cat, fish, bird, hamster

**Once you have chosen your question and the options for people to choose from, make survey slips (see examples below) to help support the students in completing the survey. Each student should have several slips they can hand to a peer or adult to assist with asking the question. Some students may have the question already memorized and be able to ask it with minimal assistance. Other students may hand it to the person and prompt with "What do you want?" using their Core Vocabulary board. The peer or adult should circle their answer, and the student should return to class with their data to include in the graph.*

What is your favorite snack? Chips, fruit, popcorn, candy	What is your favorite snack? Chips, fruit, popcorn, candy	What is your favorite snack? Chips, fruit, popcorn, candy
What is your favorite snack? Chips, fruit, popcorn, candy	What is your favorite snack? Chips, fruit, popcorn, candy	What is your favorite snack? Chips, fruit, popcorn, candy

Which sport do you like? Football, Soccer, Basketball	Which sport do you like? Football, Soccer, Basketball	Which sport do you like? Football, Soccer, Basketball
Which sport do you like? Football, Soccer, Basketball	Which sport do you like? Football, Soccer, Basketball	Which sport do you like? Football, Soccer, Basketball

What kind of books do you like to read? Fiction, Nonfiction	What kind of books do you like to read? Fiction, Nonfiction	What kind of books do you like to read? Fiction, Nonfiction
What kind of books do you like to read? Fiction, Nonfiction	What kind of books do you like to read? Fiction, Nonfiction	What kind of books do you like to read? Fiction, Nonfiction

What kind of movies do you like? Scary, Funny, Sad, Animal	What kind of movies do you like? Scary, Funny, Sad, Animal	What kind of movies do you like? Scary, Funny, Sad, Animal
What kind of movies do you like? Scary, Funny, Sad, Animal	What kind of movies do you like? Scary, Funny, Sad, Animal	What kind of movies do you like? Scary, Funny, Sad, Animal

Which subject do you like best? Reading, writing, math	Which subject do you like best? Reading, writing, math	Which subject do you like best? Reading, writing, math
Which subject do you like best? Reading, writing, math	Which subject do you like best? Reading, writing, math	Which subject do you like best? Reading, writing, math

Which subject do you like best? social studies, art, music, PE	Which subject do you like best? social studies, art, music, PE	Which subject do you like best? social studies, art, music, PE
Which subject do you like best? social studies, art, music, PE	Which subject do you like best? social studies, art, music, PE	Which subject do you like best? social studies, art, music, PE

What is your favorite pet animal? Dog, cat, fish, bird, hamster	What is your favorite pet animal? Dog, cat, fish, bird, hamster	What is your favorite pet animal? Dog, cat, fish, bird, hamster
What is your favorite pet animal? Dog, cat, fish, bird, hamster	What is your favorite pet animal? Dog, cat, fish, bird, hamster	What is your favorite pet animal? Dog, cat, fish, bird, hamster

Word Problems

Sally eats 2 cookies each day for 3 days. How many total cookies does she eat?

$$2 + 2 + 2 = 6$$

Tom mowed 1 lawn each day for 4 days. How many lawns did he mow?

$$1 + 1 + 1 + 1 = 4$$

Fran spent 3 dimes each week for 3 weeks. How many total dimes did she spend?

$$3 + 3 + 3 = 9$$

Dan made 2 cakes each day for 5 days. How many cakes did he make altogether?

$$2 + 2 + 2 + 2 + 2 = 10$$

Stan brushed 3 horses in the morning, 3 horses in the afternoon, and 3 horses at night. How many horses did he brush today?

$$3 + 3 + 3 = 9$$

Ann ate 2 apples every day for 3 days. How many total apples did she eat?

$$2 + 2 + 2 = 6$$

Here is a link to a random number generator you can use to change up the numbers in the scenarios above or to make new scenarios.

https://www.random.org/?_cf_chl_jschl_tk_=646b40d70712b9241a468a1147884b65cfbfd647-1596821626-0-ARXIZtgXF7OB9ntt22fb-JOQJ9606gjhWAC9S-nl9bWgZGAgG137W3jhOfIg_6xYK0KTVJmds7nvqAwA9hcfHaX0A8JJ73HyX3HDBGsSIUzvUyrj5yriU4aT4FF0z-zqoKND7Z1FxXGDp9vulfR46tEkYeplehoyQrIKLfnlx6PbSAqseAg99tbNm6i-QiYpSxL-8ImKvtKccgdhVZpEcOTfezc6nflD2RWYvsx6vXtkf8oql5aKl6X0dZ_R3_YU8GzaWdjuaQW9JSVCO40WHDD2dRnm-PaRlCwND83CMTuHq3aASR7Fi5PedzXhemlCk8nfbyg9soTiaQUJ14Tvno0