

SURVEY/POSTTEST

WATER AND CLIMATE

Name _____

Date _____

1. Engineers design electric power plants that use moving water to turn big turbines that generate electricity.

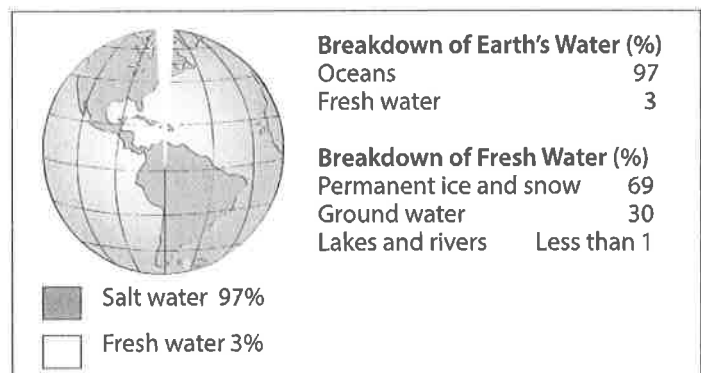
Which would be the best place to locate the power plant?

(Mark the one best answer.)

- ☐ A Next to a slow-moving river
- ☐ B Next to a lake
- ☐ C At the bottom of a steep river
- ☐ D At the top of a high waterfall

Cite evidence from investigations in class to support your answer.

2. A class was learning about the weather and where water is found on Earth. They found this chart when they did an online search.



Write **T** if the sentence is true based on the chart; write **F** if the sentence is false.

- _____ Most of Earth's water is in the ocean.
- _____ There is more water in lakes and rivers than in ground water.
- _____ Most of Earth's fresh water is in permanent ice and snow.
- _____ Lakes and rivers account for about 30 percent of the fresh water on Earth.

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3. Some children got into a car one morning. The temperature outside was 0°C. The car windows were clear and dry. Soon the car windows got “fogged up” on the inside of the car.

What caused the water to appear on the inside of the windows?

(Mark the one best answer.)

- ☐ **A** The glass and the humid air from breathing were both cold.
- ☐ **B** The glass was colder than the humid air from breathing.
- ☐ **C** The glass was warmer than the humid air from breathing.
- ☐ **D** The glass and the humid air from breathing were the same temperature.
4. Meteorologists predicted that Hurricane Maria might hit Puerto Rico in 2017. They did not know exactly when or how strong the rain and winds would be, but they still could warn people. Two hundred years ago, people knew hurricanes often happened in the fall, but they could not predict when one was coming.

Write **Y** (yes) next to each sentence that describes how meteorologists can predict storms in modern times.

Write **N** (no) next to each sentence that does not describe how meteorologists can predict storms.

- _____ Meteorologists have a lot of data about the path of past storms.
- _____ Meteorologists get together and vote on the most likely outcome.
- _____ Meteorologists can locate storms with weather satellites.
- _____ Meteorologists can monitor which way the wind is blowing.
- _____ Meteorologists know that the temperature in Puerto Rico is usually warm.

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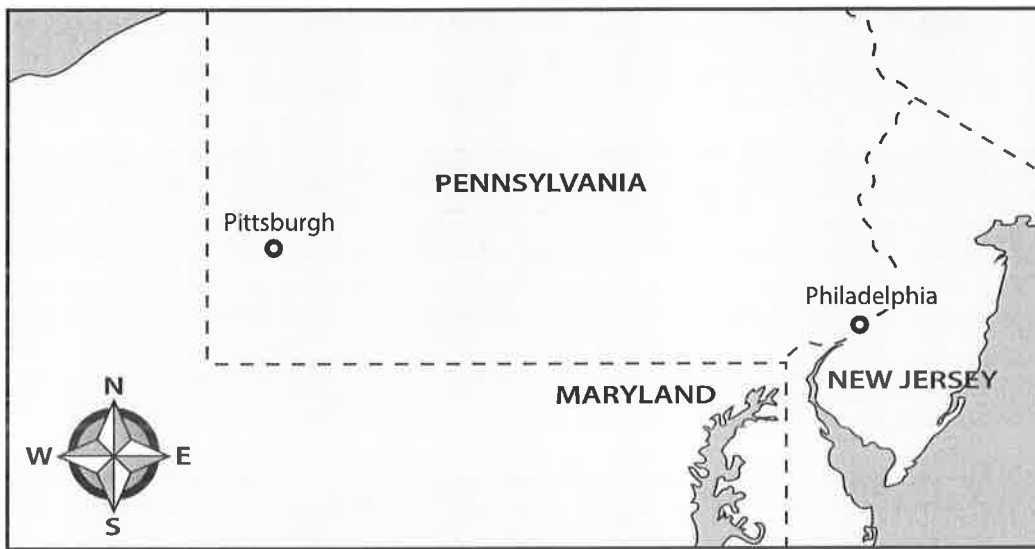
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5. Meteorologists made the observations you see in the table below.

Weather on Monday in Pittsburgh and Philadelphia

Weather condition	Pittsburgh	Philadelphia
Temperature	-5°C	2°C
Condition	Dark clouds	Partly cloudy
Precipitation	Snow	None
Wind direction	West to east	West to east



Using the map and the table, predict what weather will most likely happen next in Philadelphia.

(Mark the one best answer.)

- ☐ A Sunny and 5°C
- ☐ B Rain and 10°C
- ☐ C Snow and 5°C
- ☐ D Snow and -3°C

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6. On Monday, it rained all night. It was not raining on Tuesday morning. On Tuesday afternoon, a class of students went for a walk. They walked on four different surfaces:

- Across the middle of the grass soccer field
- Along the concrete sidewalk from the parking lot to the school
- Across the sand-covered playground under some big trees
- Along the packed-dirt path in the woods in a sunny clearing

Explain what might affect whether there were puddles on the surfaces of the areas where they walked.

7. A gardener in North Dakota left a hose outside all winter. Winter temperatures are often below 0°C. In the spring, when the temperature went above 0°C, the gardener discovered a leak in the hose.

What is the most likely explanation for what caused the leak?

(Mark the one best answer.)

- ☐ **A** The plastic hose froze and became brittle.
- ☐ **B** The air in the hose expanded and broke the hose.
- ☐ **C** The water in the hose contracted when the temperature went below 0°C.
- ☐ **D** The water in the hose expanded when it froze.

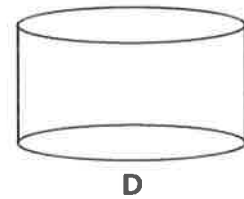
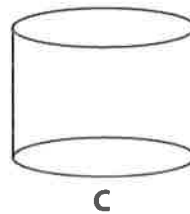
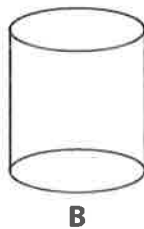
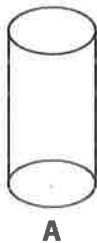
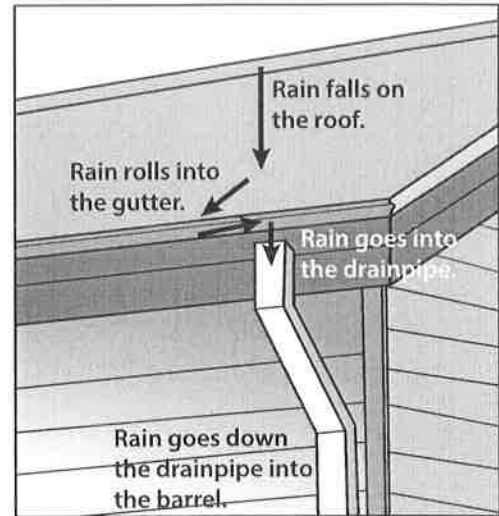
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8. In some places, it does not rain enough to water the plants that people like to grow. A family wanted to use a rain-collection system so that when it rains, the water will roll off the roof into a gutter, down a drainpipe, and into a storage barrel.

The family had four uncovered barrels in the shapes you see below. Each barrel could hold the same amount of water.



- a. Which sentence is the best recommendation and reason for choosing the barrel?

(Mark the one best answer.)

- ☐ **A** Barrel A—it has the smallest surface area, so less water will evaporate.
- ☐ **B** Barrel B—it will keep the water warm, so less water will evaporate.
- ☐ **C** Barrel C—it will keep the water cool, so less water will evaporate.
- ☐ **D** Barrel D—it has the largest surface area, so less water will evaporate.

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.....*Item 8 (continued)*

- b. The family decided to investigate which barrel would be best. They put the same amount of water in each barrel. They checked the water every hour to see how long it took the water to evaporate from each barrel.

After the investigation, the family disagreed about the conclusion. Here are their claims.

Claim A: The wider the opening of the container, the faster the water evaporates.

Claim B: The size of the opening of the container doesn't change how fast water evaporates.

Write **A** if the sentence provides evidence to support **claim A**. Write **B** if the sentence supports **claim B**. Write **X** if the sentence does not support either claim.

_____ At the beginning, the water came up to different levels in each of the containers.

_____ After 1 day, there was still water in all the containers.

_____ After 3 days, 1 L of water had evaporated from container A, and 4 L of water had evaporated from container D.

_____ Water evaporates faster at 30°C than at 20°C.

9. Scientists record patterns of weather across different times and areas over long periods of time so that they can _____.

(Mark the one best answer.)

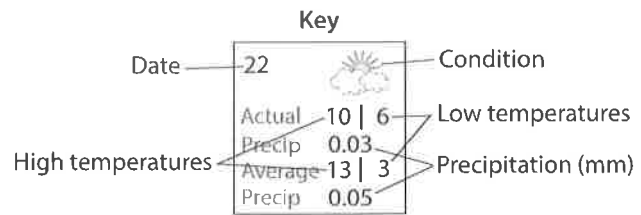
- ☐ **A** tell people what happened in another part of the world
- ☐ **B** engineer new weather instruments
- ☐ **C** plan when to conduct their lab experiments
- ☐ **D** describe climates in different regions of the world








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10. The chart below shows the weather for a week in October 2013 in Norman, Oklahoma.
(Temperatures are in °C.)



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
13  Actual: 22 16 Precip: 0.00 Average: 26 14 Precip: 0.33	14  Actual: 21 17 Precip: 18.03 Average: 26 12 Precip: 0.18	15  Actual: 21 10 Precip: 17.78 Average: 22 11 Precip: 0.38	16  Actual: 14 6 Precip: 0.00 Average: 23 9 Precip: 0.18	17  Actual: 20 3 Precip: 0.00 Average: 23 8 Precip: 0.13	18  Actual: 12 3 Precip: 2.29 Average: 24 9 Precip: 0.15	19  Actual: 18 0 Precip: 0.00 Average: 23 6 Precip: 0.20

- Make a T-table to organize the information for one weather factor given in the chart (for example, the high temperatures for that week).
- Make a bar graph showing another way to organize the same data.
- My T-table and bar graph will show _____.

Date	

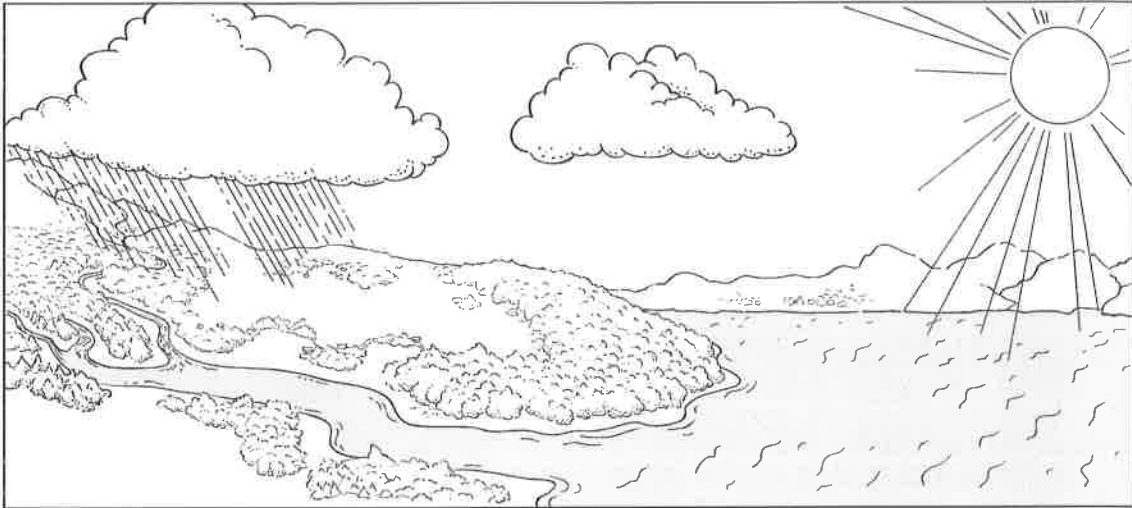
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11. a. Label the model of the water cycle, using words and arrows to describe what happens. (Use these words: evaporation, precipitation, runoff, and condensation.)



- b. Write a description to go with the model you labeled above, to explain what happens during the water cycle. Be sure to include cause-and-effect relationships. For example, when the Sun warms the water, it evaporates.

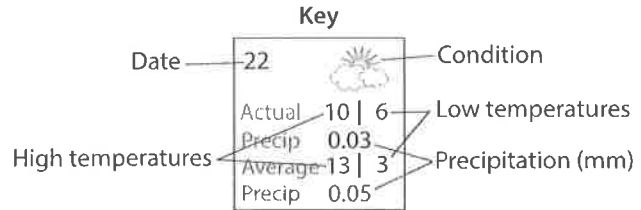
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12. The charts below show the weather in Butte, Montana, and Miami, Florida, for a week in January.








(Temperatures are in °C.)



Butte, Montana

1		2		3		4		5		6		7	
Actual	-0 -22	Actual	-17 -24	Actual	-15 -31	Actual	-10 -22	Actual	-20 -35	Actual	-14 -28	Actual	-11 -28
Precip	0.03	Precip	0.04	Precip	0.00	Precip	0.00	Precip	0.00	Precip	0.00	Precip	0.08
Average	-2 -14	Average	-2 -14	Average	-2 -14	Average	-2 -14	Average	-2 -14	Average	-2 -14	Average	-2 -14
Precip	0.05	Precip	0.05	Precip	0.05	Precip	0.05	Precip	0.05	Precip	0.05	Precip	0.05

Miami, Florida

1		2		3		4		5		6		7	
Actual	28 22	Actual	29 25	Actual	30 23	Actual	25 23	Actual	28 18	Actual	28 17	Actual	21 13
Precip	0.00	Precip	0.2	Precip	0.5	Precip	0.10	Precip	0.00	Precip	0.00	Precip	1.49
Average	25 17	Average	25 17	Average	25 17	Average	24 17	Average	23 15	Average	24 18	Average	25 18
Precip	0.20	Precip	0.05	Precip	0.13	Precip	0.10	Precip	0.18	Precip	0.03	Precip	0.05

- a. Mark **Y** (yes) next to each sentence that is supported by evidence from the tables. Mark **N** (no) next to each sentence that is not supported.

- _____ The climate in Butte was colder than in Miami.
- _____ The weather in Miami is usually cooler than it was this January.
- _____ It is more likely to snow in Butte than in Miami in January.
- _____ The climate in Butte is usually warmer than it was this January.

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Item 12 (continued)

- b. A family planned to travel from Butte to Miami next January. They found the charts you looked at on the previous page and looked at a map. They read about the climate in both places.



Mark **Y** (yes) next to each sentence that is likely to be true and should help them decide what clothes to bring. Mark **N** (no) next to each sentence that is not likely to be true.

- _____ The low temperature in Miami on January 4 was 23°C and raining, so they should bring a raincoat, but not a sweater.
- _____ Miami is near the ocean and it rains a lot, so they shouldn't bother bringing swim suits.
- _____ Miami is farther south than Butte and the climate in January is warmer, so they won't need snow boots.
- _____ The weather in Miami could be a bit warmer or colder than normal, so they should bring different kinds of clothes.