

SURVEY/POSTTEST

EARTH AND SUN

Name _____

Date _____

1. Students observed the length of the shadows of a flagpole over a long period of time.
 - a. Fill in the table below to compare the shadows based on month and time of day.

Date and time	Shadow length is		Date and time
December 21 10:00 a.m.	<input type="checkbox"/> Longer <input type="checkbox"/> Shorter <input type="checkbox"/> Same	compared to	June 21 10:00 a.m.
September 21 8:00 a.m.	<input type="checkbox"/> Longer <input type="checkbox"/> Shorter <input type="checkbox"/> Same	compared to	March 21 8:00 a.m.
December 21 8:00 a.m.	<input type="checkbox"/> Longer <input type="checkbox"/> Shorter <input type="checkbox"/> Same	compared to	December 21 11:00 a.m.
September 21 10:00 a.m.	<input type="checkbox"/> Longer <input type="checkbox"/> Shorter <input type="checkbox"/> Same	compared to	September 21 6:00 p.m.
March 21 11:00 a.m.	<input type="checkbox"/> Longer <input type="checkbox"/> Shorter <input type="checkbox"/> Same	compared to	March 21 1:00 p.m.

- b. Which statement explains the primary reason that shadows change length when observed at different times during the day and the year?

(Mark the one best answer.)

- ☐ **A** The position of the observer changes how the shadow of the flagpole appears.
- ☐ **B** The angle of the Sun's rays change because of Earth's rotation and revolution.
- ☐ **C** The angle of the Sun's rays change because of the Sun's rotation and revolution.
- ☐ **D** The revolution of the Moon around Earth changes how we see the Sun's shadow.

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2. The phases of the Moon that we see from Earth change in a predictable pattern. Which of the following motions explains that pattern?

(Mark the one best answer.)

- ☐ A As the Moon revolves around the Sun, different amounts of the Moon are lit up.
- ☐ B As the Moon rotates on its axis, different amounts of the Moon's lighted side face Earth.
- ☐ C As the Moon revolves around Earth, different amounts of Earth's shadow are cast upon the Moon.
- ☐ D As the Moon revolves around Earth, we see the lit part of the Moon's surface from different angles.
3. The objects that you can see in the sky have different brightness. Some objects are larger than others. Some objects are farther from Earth than others.
- a. Number the objects in table A from 1 (smallest) to 4 (largest).
- b. Number the objects in table B from 1 (closest) to 4 (farthest) from Earth.

Table A

Object in the sky	Size
Moon	
Sun	
Planets	
Comets	

Table B

Object in the sky	Distance from Earth
Stars	
Moon	
Sun	
Jupiter	

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4. It has been said that people are drinking the same water that dinosaurs drank long before humans even existed on Earth. Describe in words and/or diagrams the ways water recycles among Earth's systems.

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5. A scientist collected air and ground temperatures near a lake at different times. At the same time, another scientist recorded water temperatures in the middle of the lake. Their data are represented in the table.

Observation day	Temperature		
	Air	Water	Ground
Monday, 1:00 p.m.	15°C	18°C	16°C
Monday, 11:00 p.m.	8°C	16°C	12°C

The models below represent air and water at 1:00 p.m. and at 11:00 p.m. Which best represents air at 11:00 p.m.?

(Mark the one best answer.)

☐ A

☐ B

☐ C

☐ D

6. A woman bought a white wading pool for her grandchildren. She wanted the water to heat up quickly. Which solution below would heat up the water fastest?

(Mark the one best answer.)

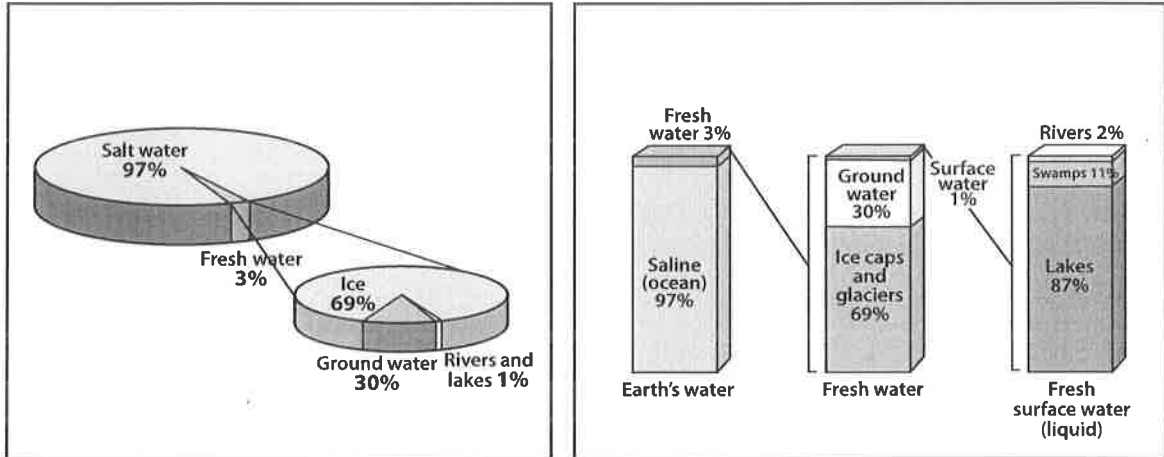
- ☐ A Cover the pool with a clear plastic cover.
- ☐ B Put a sheet of dark blue plastic on the bottom and cover the pool with a clear plastic cover.
- ☐ C Put a sheet of yellow plastic on the bottom and leave the pool uncovered.
- ☐ D Put a sheet of black plastic on the bottom and leave the pool uncovered.

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7. The graphical displays below show the distributon of water on Earth.



- a. Based on evidence from the graphical displays, where is most of the fresh water on Earth?
- (Mark the one best answer.)
- ☐ A Ground water
 - ☐ B Lakes
 - ☐ C Ice caps and glaciers
 - ☐ D Ocean
- b. Based on information from the graphical displays, where does most of the water vapor in the atmosphere come from?

(Mark the one best answer.)

- ☐ F Ground water
- ☐ G Lakes
- ☐ H Ice caps and glaciers
- ☐ J Ocean

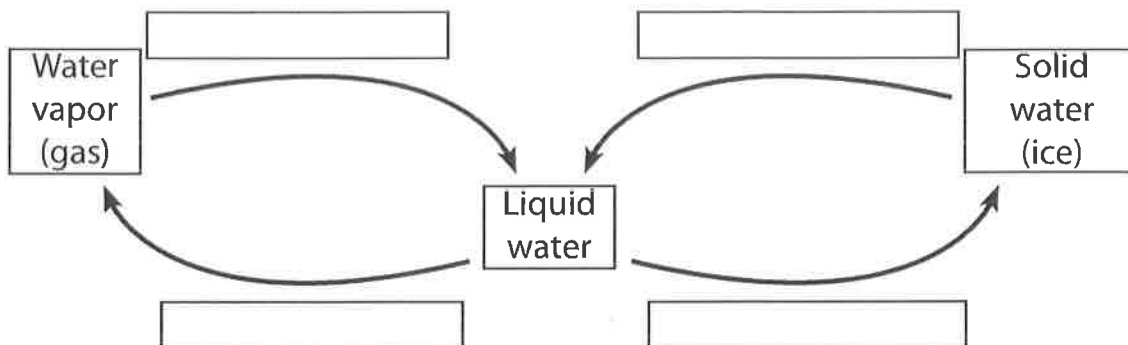
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8. When water changes from one state to another, each process has a name.



Use the word bank to complete this diagram of phase change.

Melting Condensation
Evaporation Freezing

9. Complete the following explanations.

- a. When it rains, water flows into streams, streams flow into rivers, and rivers eventually flow into the ocean. This happens because _____.
- b. There is a scientific law that says objects in motion stay in motion unless acted on by another force. Earth should move in a straight line, but instead it moves in a curved line, orbiting the Sun. _____ keeps Earth in orbit around the Sun.

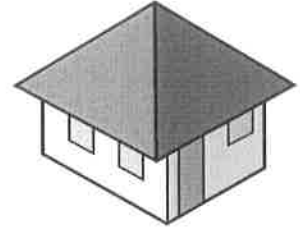
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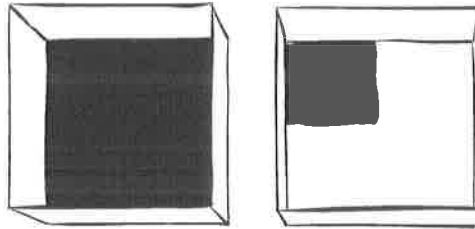
Name _____

10. A solar power company has been hired to install electricity-generating solar panels on a roof. The roof is pyramid shaped, with each of the four sides directly facing east, west, north, and south. The house is located in North America. Which design best describes which side of the roof should hold the solar panel in order to generate the most electricity?



(Mark the one best answer.)

- ☐ A On the north side because north is always up on maps and the Sun is up in the sky
- ☐ B On the west side because the Sun sets in the west so it's warmer in the afternoon
- ☐ C On the east side because the Sun rises in the east and the rising Sun has more energy
- ☐ D On the south side because the Sun moves across the southern sky all day
11. Engineers plan and carry out fair tests in order to improve models and prototypes. In this investigation, engineers were testing the surface of the collectors in solar water heaters. Based on what you have learned in your investigations in class, predict how the size of the collector affects the change in temperature.



(Mark the one best answer.)

- ☐ A The larger the black area, the more the water will heat up.
- ☐ B The larger the white area, the more the water will heat up.
- ☐ C The smaller the black area, the more the water will heat up.
- ☐ D The size of the black area should not affect how much the water heats up.

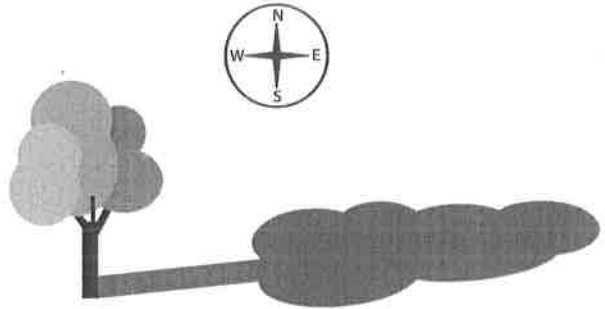
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12. The image shows a tree and its shadow.
Which statement best estimates the time of day
and explains what is seen in the image?



(Mark the one best answer.)

- ☐ **A** It is sunrise. I know that because as Earth turns on its axis, the Sun rises in the east. When the Sun is low in the sky, there are long shadows to the east.
- ☐ **B** It is late morning. I know that because as the Sun revolves around Earth each day, Earth casts long shadows in the late morning to the east.
- ☐ **C** It is sunset. I know that because the Sun sets low in the western sky when the Sun's dark side begins to face Earth, casting a long shadow to the east.
- ☐ **D** It is sunset. I know that because as Earth turns on its axis, the Sun sets in the west and the tree blocks light from the Sun, casting a long shadow to the east.
13. Which pair of phenomena is caused by the same motion? (Assume your frame of reference is standing on Earth.)

(Mark the one best answer.)

- ☐ **A** Day and night / phases of the Moon
- ☐ **B** Phases of the Moon / positions of stars in the sky at different times of the year
- ☐ **C** Sunrise and sunset / positions of stars in the sky at different times during the night
- ☐ **D** Position of the Sun in the sky at different times of the day / phases of the Moon