Grade 8

Ch. 8 Lesson 2

Earth and Space Science

Page #	Question	Answer(s)	Links/Sources	Student Resources
281	According to the pie charts, about how much of the Earth's total water is freshwater	*3%		
281	About how much of this is usable water is ground water?	*29%		
281	Where is the remaining surface water found?	*In lakes, rivers, soil, vapor, and organisms.		
281	Why is most of Earth's water considered to be hard to use by humans?	*It is salt water or frozen in ice caps and glaciers.		
281	What are some ways we are affected by water today?	Sample answer: We are affected by drinking water, watering our crops and gardens, using it to wash clothes and dishes, etc.		
281	How would our lives be different if we had all the freshwater we needed?	Sample answer: There would be no need to conserve water, we would be able to irrigate more land to raise crops, we would not have to worry about water shortages due to droughts.		
281	Why is most of Earth's freshwater not easily available for use by people?	Sample answer: Most freshwater is locked up in glaciers and ice caps.		
281	How does your use of water differ from the ways in which other organisms use water.	Sample answer: Other organisms use water primarily for drinking, swimming in or living in. People use water to wash themselves their clothes and dishes, they used water in industry and manufacturing, they use water to irrigate lawns, fields and crops.		
282	How do you think temperature affects rates of evaporation?	Sample answer: Rates of evaporation increase when temperatures are warm.		
282	How do you contribute to the water cycle?	*Water in our lungs is released and when we exhale and evaporates into the atmosphere.		
282	How do plants contribute to the water cycle?	*The pass water vapor to the atmosphere through transpiration.		
282	Which processes directly add molecules of water to the atmosphere?	*Evaporation and transpiration.		
282	Explain how the "rivers flow to the sea, but the sea is not full."	*Ecclesiastes 1:7 is referring to how water on Earth is recycled in the water cycle, so no new water is being added.		
282	What does the word *matter* mean in this sentence?	*Something that takes up space and has mass.		
282	What other meanings of *matter* can you think of?	*Sample answer: A subject that is being considered.		
282	During what processes of the water cycle might energy be absorbed?	Sample answer: During evaporation.		
282	When might it be released?	Sample answer: During condensation.		

282	What gas is formed during this process?	Water vapor.		
282	Under what conditions do you think that can happen?	Sample answer: When ice and snow melt at high elevations.		
282	In what other ways does water enter the atmosphere?	Sample answer: As animals exhale and as plants transpire.		
282	What source of atmospheric water provides the most water? Why?	Sample answer: Evaporation of the ocean. Because ocean water covers the greatest amount of the Earth's surface.		
283	What formed on the sides of the inverted cup?	*Droplets of water should form if the room is not too warm.		
283	What processes did this model in the water cycle?	*Transpiration and condensation.		
283	Where is energy released in this model?	*As the water condenses on the side of the inverted cup.		
283	Where is water being taken from the environment?	*During transpiration where the water is changing to water vapor in the air.		
283	Why do you think this happens?	Sample answer: Because as the mountain side causes the air to be pushed up, it cools and the water vapor in it condenses to form clouds.		
283	In what other situations might clouds form?	Sample answer: When a warm air mass collides with a cold air mass.		
283	What type of weather are cumulonimbus clouds associated with?	Sample answer: Thunderstorms.		
283	At what altitudes are these clouds formed?	Above 5 km (18,000 feet)		
283	What kinds of clouds are in the sky today.	Answers will vary depending on location and weather.		
283	How do they differ from other clouds you have seen in the past.	Answers will vary. Allow students to share the observations of clouds they have seen in the past.		
283	Which process in the water cycle releases energy into the environment, and which process takes energy from the environment?	*Condensation releases energy into the environment, and evaporation takes energy from the environment.		
283	What conditions are required for a cloud to form?	*Water vapor in the air, cooler temperatures, and condensation nuclei.		
283	How can clouds affect temperature at the Earth's surface?	*Sample answer: Depending on the time of day, clouds may keep solar radiation from warming Earth or they may reradiate heat energy back to the Earth's surface.		
284	What type of clouds would you want to see if you were going on a picnic?	*Sample answer: Any clouds without *-nimbus* in the name as those clouds produce rain.		
284	How can you form a cloud?	By creating a model atmosphere in a small controlled environment, like the bottle with soot particles and water in it, you can make a cloud.		
284	Why did you need to let the bottle fill with smoke?	So there were small nuclei around which the water vapor could condense.		

284	Why did you have to squeeze the bottle to help the cloud form?	To change the air pressure inside the bottle.		
284	Did the cloud disappear at any time?	When you squeeze the bottle the cloud disappears.		
284	If so, can you explain why?	Sample answer: Squeezing the bottle increases air pressure which increases temperature, which causes the water droplets to go back to water vapor and the cloud disappears		
285	How do clouds release energy from place to place?	*As evaporation occurs, heat energy is taken from the environment. This energy can be released in another area as the vapor cools and condenses into a cloud.		
285	What affect can clouds have on a location's temperature range?	*The clouds can block radiation from reaching Earth, leading to cooler temperatures. They also keep heat from escaping Earth's surface, maintaining heat.		
285	In an area experiencing below freezing temperatures, why can a cloudy day be warmer than a sunny day?	*The clouds help to keep heat energy that is leaving the Earth's surface from escaping into the atmosphere, whereas heat is lost on a sunny day.		
285	What can happen to the precipitation that falls from these clouds?	*It can seep directly into the ground. It can enter bodies of water nearby. Plants may take in water from the ground, and animals many drink water from lakes, streams, ponds, and rivers.		
285	How do clouds transport energy from place to place?	Answered in line 285 above.		
285	What effect can cloud cover have on the temperature range of a location.	Sample answer: Clouds can make it cooler by blocking out some of the Sun's radiation, or it can make it warmer, because it can block reflected heat from passing to the atmosphere, thus making the area warmer.		
285	How does this explain the typical temperature range of a desert?	Sample answer: Deserts are warmer during the day than other areas because there is no cloud cover to shield desert areas from the full sunlight, they are cooler night than other areas, because there is no cloud cover to hold the heat causing temperatures to cool off at night.		
285	What determines the type of precipitation that will fall?	The temperature of the air the precipitation forms in and the temperature of the air it falls through.		
285	Why can more than one type of precipitation fall during a storm?	Because changes in air temperature and pressure during the duration of the storm.		
286	How are freezing rain and sleet different from each other?	*Freezing rain does not freeze until it hits the freezing ground. Sleet forms as rain falls, freezing before it hits the ground.		
286	Predict what you would see if you took a cross-section of hailstone?	*You would likely see rings in the hailstone.		

287	How much water will be lost by transpiration?	Answers will vary depending on the kind of plant used, the size of the plants, the room temperature, and the amount of light, as well as other factors.		
287	How do other factors affect the rate of transpiration?	Sample answer: Cooler temperature will less transpiration than warmer temperature, different kinds of plants have different rates of transpiration, different sizes of plants will have different rates of transpiration. Note: Make sure students are testing only one variable at a time and that they have an appropriate control in each experiment they design and conduct.		
288	What form of Earth's water moves through the water cycle most slowly, and where is it found?	*Ice moves (the water in ice) most slowly, having to melt first.		
288	What relationship can you observe between cloud type and the amount of precipitation?	*Sample answer: Stratus clouds were associated with rainy weather. Cirrus clouds were associated with fair weather. Cumulus clouds indicated both fair weather and rainy weather.		
	* Means the answer is found in the TE.			