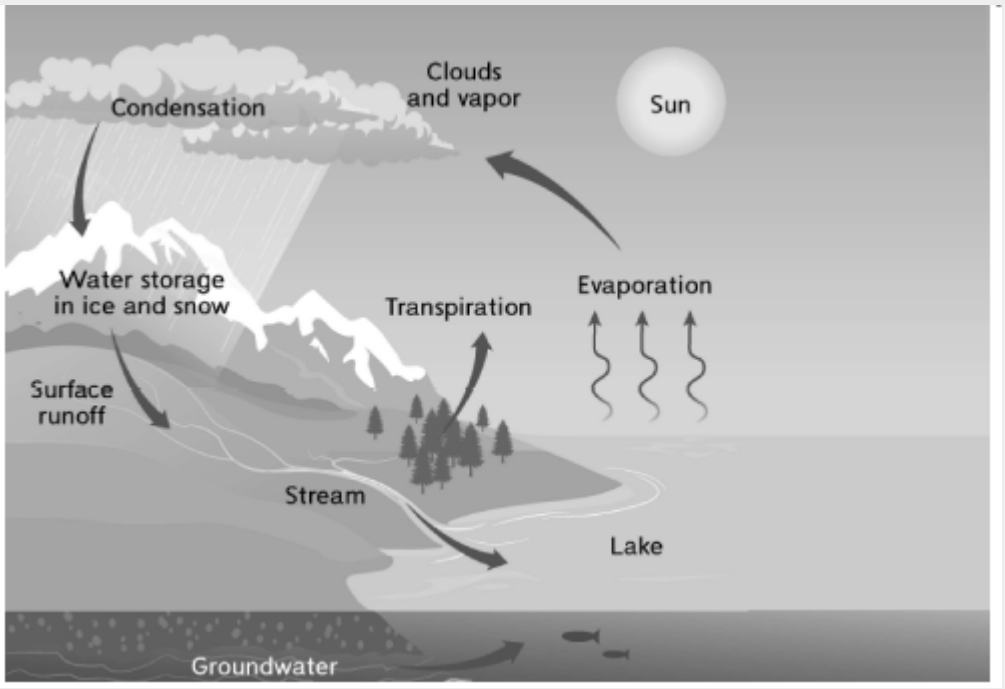
2023-2024 Gr5 Science Benchmark Unit 3

This model of water cycle can be used to explain how Earth's systems interact.



Question 1.
How do the biosphere and hydrosphere both contribute to the water cycle?

A. They form liquid water.

B. They cause surface runoff.

C. They add water vapor to the air.

D. They move water through the soil.

Question 2.
A student wants to draw a model of an interaction between the atmosphere and biosphere. Which interaction should he draw?

A. trees in a forest taking in air

B. fog forming over coastal waters

C. volcanic ash forming a cloud after an eruption

D. water flowing through a grassy plain toward the ocean

Question 3.

The students learn that the Amazon rain forest receives between 2 and 11 meters (about 80 and 430 inches) of rain each year.

Which systems are interacting most when a rainstorm occurs over the rain forest?

A. the atmosphere and the hydrosphere

B. the atmosphere and the geosphere

C. the biosphere and the hydrosphere

D. the biosphere and the geosphere

Question 4.

Students in a science class are building models to demonstrate how Earth's systems interact. Which model demonstrates how running water causes erosion and deposition?

A. Small pebbles are placed inside a bucket. Water is slowly poured into the bucket. The pebbles stay in place.

B. Water is poured down the side of a mound of dirt. A shallow trench forms where the water runs. Dirt from the top of the mound is carried to the bottom.

C. An aluminum tray is filled with sand. A fan is placed at one end of the tray. When the fan is turned on, it blows the sand from one side of the tray to the other.

D. A teaspoon of sand is added to a glass of water. The water is stirred until it becomes cloudy.

Question 5.

A student in the class researches a model of a new well that would provide more groundwater for drinking. The new well would be able to dig through layers of rock that were previously too hard to drill through.

Which of Earth's systems interact within the model of the well?

A. atmosphere and biosphere

B. atmosphere and geosphere

C. hydrosphere and biosphere

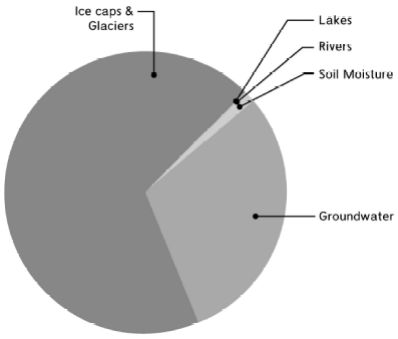
D. hydrosphere and geosphere

Question 6.

A student in the class researches a model of a new well that would provide more groundwater for drinking. The new well would be able to dig through layers of rock that were previously too hard to drill through.

Which graph **best** represents the closest fraction of fresh water on Earth?

A.



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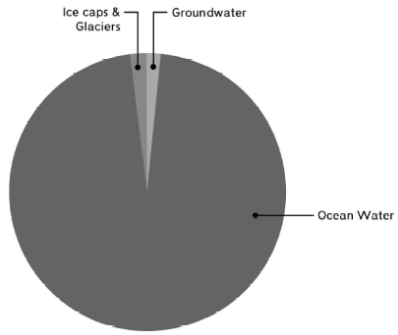
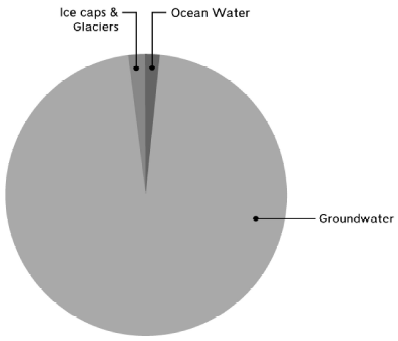
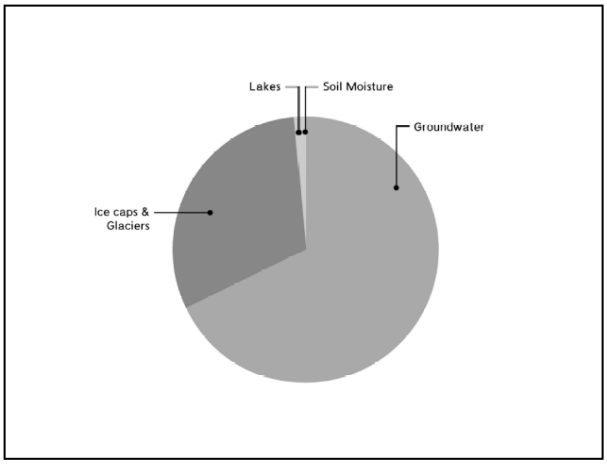


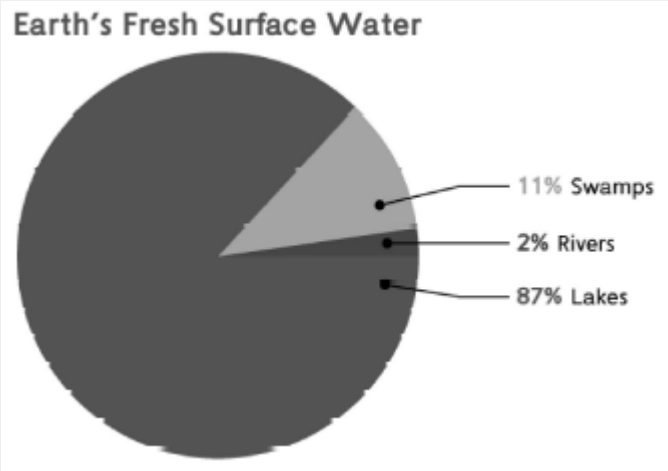
C.



D.


Lakes
Soil Moisture
Groundwater
Ice caps &
Glaciers

Salt water found in the oceans represents 97% of the total water on Earth, while fresh water represents 3%. Fresh surface water represents less than 1% of the fresh water on Earth. The following circle graph represents the distribution of Earth's fresh surface water.



Question 7.

Based on the information, which statements are true? Select **three** that apply.

A. Swamps and rivers make up 13% of Earth's fresh surface water.

B. Lakes make up most of Earth's fresh water.

C. Rivers makes up most of Earth's fresh surface water.

D. A small percentage of Earth's fresh water is found in lakes, rivers and swamps.

E. The majority of water on Earth is found in the oceans.

Question 8.

Fill in the blanks using the available answer choices.

About 97 percent of all water on Earth's surface is in the form of

A. salt

B. fresh

water.

Question 9.

Which of the following is an example of a human activity that can help protect and conserve resources?

A. Organize a group to pick up trash and to teach others how to dispose of all trash properly.

B. Plant new trees, bushes, and flowers that are native to the area.

C. Compost garbage, grass, and leaves. Use the compost to feed plants instead of using chemical fertilizer.

D. Ride a bike or walk instead of using a gasoline-run automobile.

Question 10.

Human activities, such as agriculture, can negatively impact Earth's resources. Pollution is any harmful substance that affects Earth's resources. In agriculture, fertilizer can sometimes be a source of pollution.

Which of the following are steps a vegetable farmer could take to prevent water pollution? Select the **two** answers that apply

A. use extra fertilizer to make plants healthy and strong

B. choose plants that require less fertilizer

C. choose plants that require less water

D. water plants at night so less water evaporates

E. sell vegetables locally so less fossil fuel is burned in the process of transporting produce

In December 2015, countries all over the world came together to reach an agreement known as The Paris Agreement. The main goal of this agreement was to create a global response to climate change and the rise in global temperature that affects the atmosphere. The agreement requires that each country make changes that will help the global community. Many countries plan to use less carbon-a natural resource and switch to a form of clean energy. Many scientists state that by 2050, emissions need to be reduced by 40-70%. The Paris Agreement hopes to encourage communities to address this goal.

Question 11.

Which statements describe a community plan that aligns with The Paris Agreement and a shift to clean energy sources? Select the **three** that apply.

A. A country is a small island near volcanoes. Because of this, it is able to run on almost only hydroelectric, solar, wind, and geothermal energy.

B. A country's National Development & Reform Commission wrote a draft policy to increase renewable energy to 35% by the year 2030. They previously had a goal of 20% by 2030.

C. A city uses coal to power its largest city. It plans to reduce its carbon footprint by 5% in the next 20 years.

D. A city's leaders have worked together to create enough solar energy to power over 30,000 homes. They continue to add more solar energy each year.

A class decides to clean up a nearby beach as a community service project. While they are there, they hang posters to alert businesses, farms, and homes of the negative impact that waste and chemicals can have on the environment If not handled properly. They also collect several trash bags full of wrappers, plastic bottles, cups, used gas cans, and paper plates. They see an abundance of algae growing in the water and dead fish washed up on the shore.

Question 12.

Which of the following is an impact that the pollution had on the beach ecosystem?

A. The pollution had a negative impact on only the cleanliness and beauty of the beach and the natural environment.

B. The pollution positively impacted the waters ability to tolerate acid rain.

C. The waste from nearby businesses and farms could have a negative impact on the entire ecosystem. This pollution may have altered the pH of the water and caused an overgrowth of algae, which in turn killed the fish.

D. The pollution had a positive impact on the environment. The trash created an obstacle for the plant and animal life to adapt to, which made them stronger.

Question 13.

California became the first state to ban the use of plastic straws. This ban is good news because single-use plastic straws can harm our environment.

How can plastic straws harm the environment? Select the two that apply.

A. Plastic straws take up space in landfills that often destroy habitats for wildlife.

B. Plastic straws are inexpensive to make.

C. Plastic straws leak chemicals into the soil and water when they decompose.

D. Plastic straws are complicated to produce.

Question 14.

Which are sources of freshwater.

Select **all** that apply.

A. rivers

B. oceans

C. aquifers

D. reservoirs

Fresh water is limited in inland areas, but is even more limited in coastal areas.

Table 1 shows water sources and the total distribution of water on Earth.

Table 1. Water Distribution on Earth

Water Source	Type of Water	Percentage of Total Water
Oceans, bays	Salt	97
Ice caps, glaciers (ice)	Fresh	2
Groundwater (underground)	Fresh	Less than 1 (0.7)
Lakes, rivers (surface water)	Fresh	Less than 1 (0.3)

Samples of surface water were collected from three locations in a coastal area before and after a storm. The data in Table 2 show the amount of salt in grams for every liter (g/L) of water in each sample.

Table 2. Salt Levels before and after Storm

Surface Water Location	Amount of Salt in Water (g/L)	
	Before the Storm	After the Storm
A	1	3
B	5	20
C	7	15

Question 15.

Figure 1 shows the locations where data for samples A, B, and C were collected. Location X is another area where samples were collected before and after the storm.

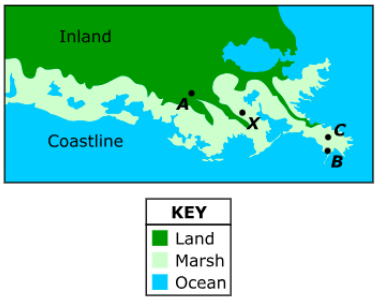


Figure 1. Locations of Coastal Water Samples

Using Table 2 and Figure 1, describe how the storm influences surface water salt levels near the coastline.

Complete the sentences by choosing the correct answer from each box.

The storm causes the ocean level to rise, which will [Box Y] the mixing of fresh surface water and ocean water. Therefore, salt levels near the coastline after the storm will be [Box Z] salt levels before the storm.

Box Y:

A. decrease

B. increase

Box Z:

A. higher than

B. lower than

C. equal to

Question 16.

Identify the statement that best describes where Earth's freshwater can be found.

A. Most of the freshwater is trapped in glaciers and ice caps.

B. Earth's freshwater is spread out equally over ice, groundwater, and surface water.

C. Most of the freshwater on Earth is found underground. The rest is stored as surface water.

D. Earth's freshwater is found mostly in rivers and streams. Very little is found in glaciers or ice caps.

Question 17.

Kacey used a pump attached to a bicycle tire to inflate the tire. Before she used the pump, the tire was flexible. Afterward, it was not flexible and held its shape. Why did the tire hold its shape after it was inflated?

A. Air particles pushed against the inside of the tire.

B. Air from the pump changed the tire into a harder type of rubber.

C. Air changed into a solid substance inside the tire and made it hold its shape.

D. Air particles in the tire got bigger and filled the space in the tire.

Question 18.

Which of these is evidence that air is made of particles of matter?

A. You can feel wind against your face.

B. You can see through the atmosphere into space.

C. On a hot day, the air feels warmer than water in a lake.

D. When you drop a heavy object in the air, it falls until it hits a hard surface.