

Tennessee Comprehensive Assessment Program TCAP

Science Grade 6 | Practice Test



Please PRINT all information in the box.

Student Name: _____

Teacher Name: _____

School: _____

District: _____

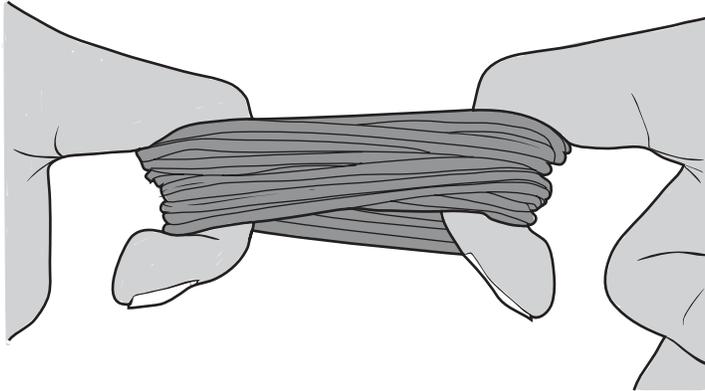
All practice test items represent the appropriate grade level/content standards—however, the practice test may contain item types that no longer appear on the operational assessment.



Directions

Read the sample and mark the correct answer.

A student wraps twelve rubber bands around both of his index fingers, as shown in the picture. The student then moves his hands away from each other, stretching the rubber bands.



Which of these explains the change in energy of the rubber bands as they are relaxed when the student brings his hands closer together?

- A.** The amount of kinetic energy is decreased.
- B.** The amount of potential energy is increased.
- C.** Potential energy converts to kinetic energy.
- D.** Kinetic energy converts to potential energy.



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1. Fireflies are insects with a glowing light inside their bodies. A chemical reaction produces this light. The light helps fireflies in several ways. The list describes two ways the light helps fireflies.

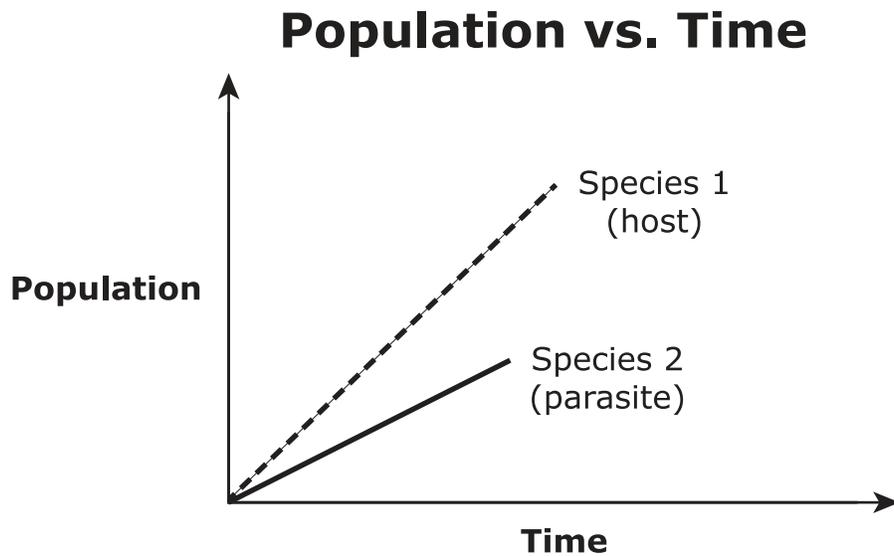
Ways Fireflies Use Light

- Males flash lights in patterns to attract females.
- Light warns predators to stay away because the insects contain a chemical that tastes bad.

A student claims that a firefly population experienced a change that made it impossible for the insects to flash their lights. Which of these changes would support the student's claim?

- A.** The population would increase, because predators could no longer see the fireflies to catch them as prey.
- B.** The population would decrease, because the male fireflies could not attract mates without their lights.
- C.** The population would increase, because more fireflies would move into the unlit area, thinking it was empty.
- D.** The population would decrease, because prey for the fireflies would no longer be able to see their lights.

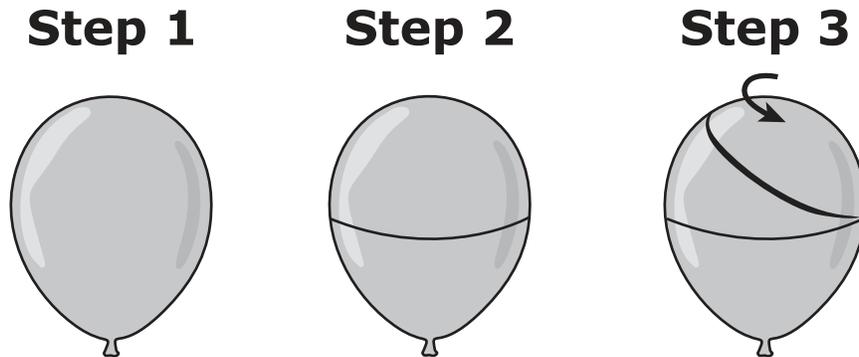
2. The graph shows the populations of two species over time. Species 2 is a parasite of Species 1. No other species is interacting with Species 1 or Species 2.



If the population of Species 1 decreased, what would most likely happen first to Species 2?

- M.** Species 2 would increase in number.
- P.** Species 2 would decrease in number.
- R.** Species 2 would become extinct.
- S.** Species 2 would find a different host.

3. Students are demonstrating the movement of wind. In Step 1, they blow up a balloon, trying to make it as round as possible. In Step 2, they draw a line around the middle of the balloon to represent the equator. In Step 3, one student spins the balloon. While the balloon spins, another student draws a line from the middle of the balloon to the top.



In which two ways can this model represent the Coriolis effect?

- A. Warm air rising causes cooler air to sink to the surface.
- B. Rotation of Earth causes the wind to appear to curve.
- C. Wind at the equator is denser than wind at the poles.
- D. Cool air flows faster than warmer air as it moves across Earth.
- E. The amount the wind appears to curve depends on the speed of Earth's rotation.

4. The zebra mussel is an invasive species that impacts waterways by clogging pipes and competing with native mussels for resources. In 2014, a new program began to inform and educate fishermen on ways to prevent the spread of these mussels. The table shows the percentage of waterways that are impacted by the zebra mussels.

Zebra Mussels Over Time

Year	Percentage of Waterways with Zebra Mussels
2014	65%
2015	63%
2016	59%
2017	58%

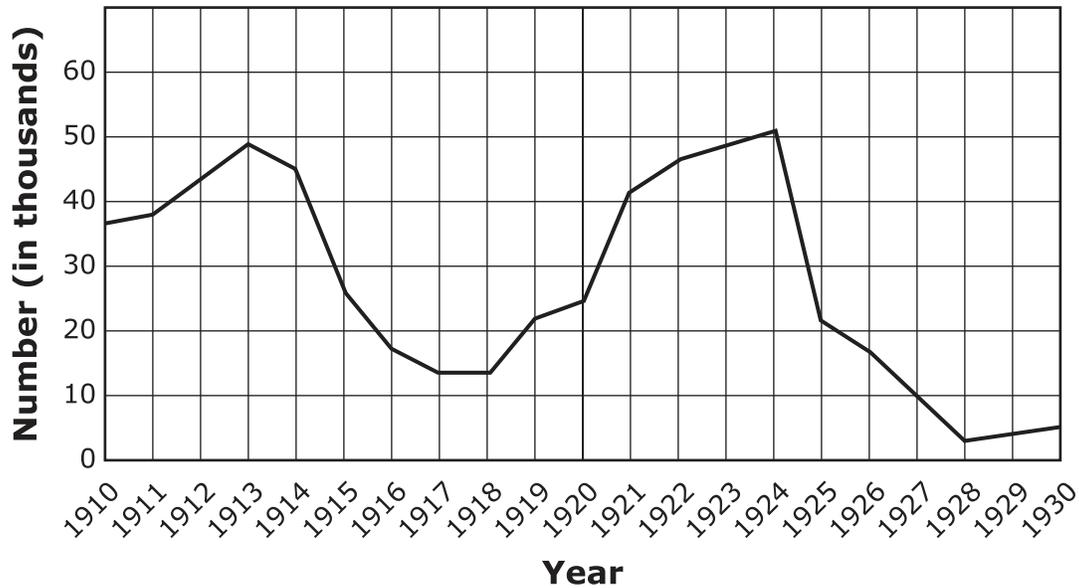
What has been the overall impact of the new program on the spread of zebra mussels?

- M.** a decrease in the number of zebra mussels along the waterways
- P.** an increase in the number of zebra mussels along the waterways
- R.** no effect because more time is needed to determine an outcome
- S.** no change in the number of zebra mussels infecting the waterways

5. Which of these best explains how frontal boundaries can lead to severe storms?
- A. Cold air flows down the side of a mountain away from the ocean.
 - B. Cold air remains over an ocean for an extended period of time.
 - C. Warm air is forced up rapidly by a cold air mass.
 - D. Warm air rises slowly over a cold air mass.

6. Students study a rabbit population graph. They observe a dramatic decrease in the number of rabbits starting in 1924.

Rabbit Population



Select the three factors that may have caused this decrease in the rabbit population.

- M. an increase in the predator population
- P. an increase in the producer population
- R. a disease in the rabbit population
- S. a slight decrease in the rainfall
- T. a decrease in the producer population

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7. Students wrote down four different science project ideas for heat transfer investigations.

Which project idea is an investigation about heat transfer through conduction?

- A.**
- Project Idea A**
- Place a thermometer 10 cm from an identified heat source.
 - Place a second thermometer 50 cm from the heat source.
 - Place a third thermometer 100 cm from the heat source.
 - Record the temperature of each thermometer.
 - Turn on the heat source.
 - Record the temperature of each thermometer after 2 minutes, 3 minutes, and 4 minutes.

- B.**
- Project Idea B**
- Hold a pinwheel 30 cm above a heat source.
 - Make observations about the movement of the pinwheel.
 - Hold the pinwheel 60 cm away from the same heat source.
 - Make observations about the movement of the pinwheel.
 - Compare observations.

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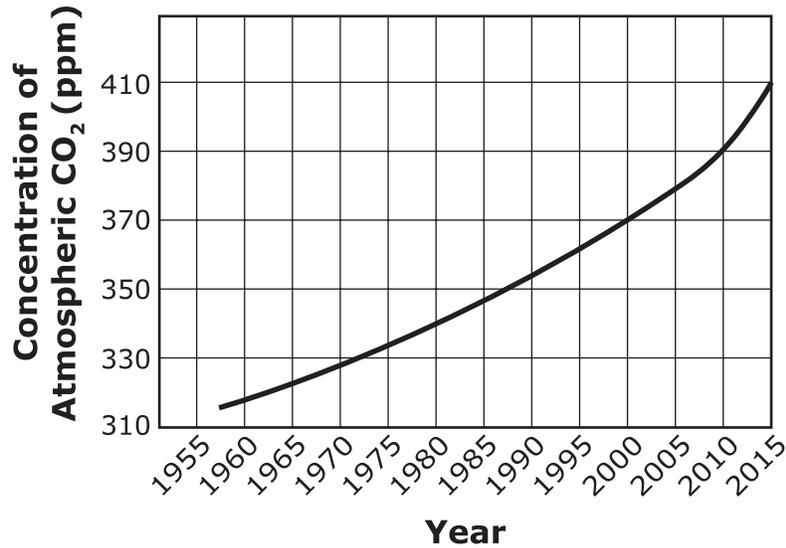
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- C.**
- Project Idea C**
- Poke a hole into the side of a shoebox.
 - Insert a thermometer through the hole.
 - Cover the shoebox with white paper.
 - Record the temperature.
 - Turn on light over the shoebox.
 - Record the temperature after 2 minutes and 5 minutes.

- D.**
- Project Idea D**
- Record the surface temperature of a strip of aluminum, a thin strip of wood, and a strip of plastic.
 - Place all three materials in a preheated frying pan.
 - After two minutes remove each material from the pan.
 - Record the surface temperature of each material.

8. Carbon dioxide is a gas present in Earth's atmosphere. The first graph shows the changes in the levels of carbon dioxide in Earth's atmosphere from 1958 to 2015.

Carbon Dioxide in Earth's Atmosphere Over Time

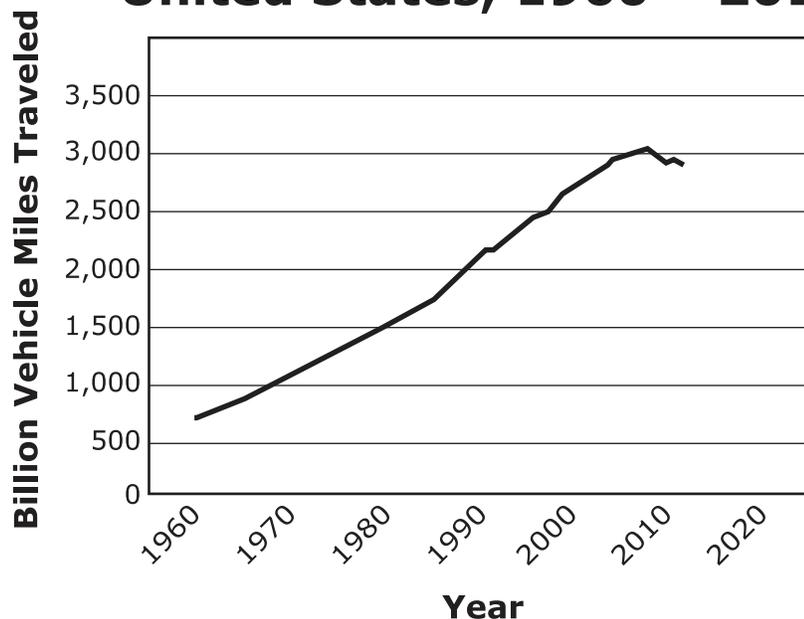


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The second graph shows changes in the miles traveled by humans using cars, trucks, and motorcycles from 1960 to 2011 in the United States.

Miles Traveled by Cars, Trucks, and Motorcycles in the United States, 1960 – 2011



Based on the two graphs, which statement **best** describes the relationship between the use of motor vehicles and carbon dioxide levels?

- M.** The increased use of motor vehicles in the United States during these years caused a decrease in carbon dioxide in Earth's atmosphere.
- P.** The decreased use of motor vehicles in the United States during these years caused an increase in carbon dioxide in Earth's atmosphere.
- R.** The decreased use of motor vehicles in the United States during these years caused a decrease in carbon dioxide in Earth's atmosphere.
- S.** The increased use of motor vehicles in the United States during these years caused an increase in carbon dioxide in Earth's atmosphere.

- 9. Which statement correctly describes one way ocean currents affect a region?**
- A.** Deep ocean currents push into estuaries, creating sand deposits that form barrier islands.
 - B.** Cold ocean currents along the equator increase evaporation rates, creating circular winds that produce tropical storms.
 - C.** Warm ocean currents keep coastal air temperatures warm, creating moderate climate conditions in coastal regions.
 - D.** Deep ocean currents move water from polar seas toward the equator, creating drafts of cold air that blow over polar regions.

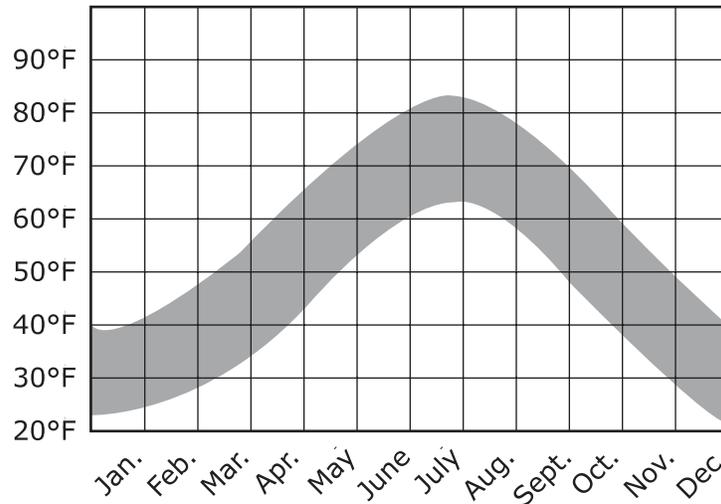
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Questions 10 – 12 refer to the passage(s) and image(s) shown.

Bird Migration – Part 1

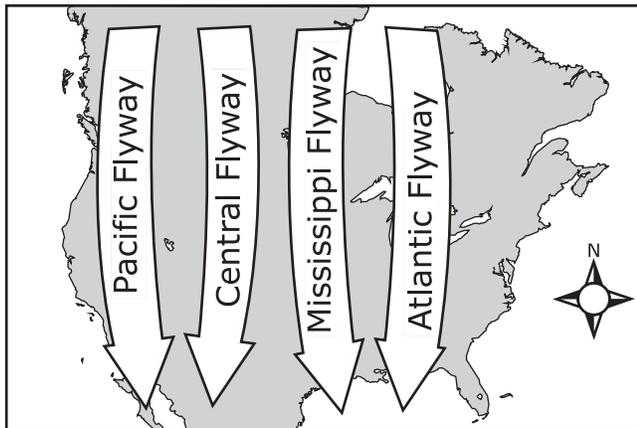
As summer becomes fall, temperatures become colder. Many North American birds are seen flying south every year. Some birds migrate just a few states away. Other birds migrate thousands of miles from one continent to another. Some birds have been sighted in Central America in the winter. Many types of birds migrate. Seed-eaters, insect-eaters, and even scavengers such as vultures migrate south for the winter. Then they return north in the spring to nest. The graph shows average temperatures in the United States.

United States Average Temperatures

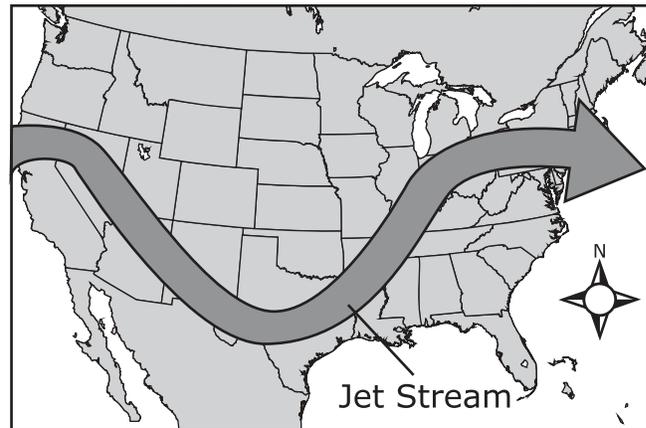


These migratory birds have specific flight routes called flyways. Migrating birds may use different flyways for the different migrations. In the fall, the birds may use the flyway closest to the bird's habitat to move south. In the spring, most birds use the jet stream for the return flight north.

North American Flyways for Migrating Birds



Jet Stream Over North America



When birds migrate, they encounter many hazards. Many birds are unable to make it back north. Small birds tend to fly during the night and eat during the day. Weather can also delay them in their journey south or north.

- 10. Based on the information given, which biotic factor that changes annually most likely signals the birds to migrate?**
- M.** loss of offspring
 - P.** reduction of food sources
 - R.** increase in the number of predators
 - S.** number of female birds in the population
- 11. Based on the data in the graph, which statement best explains the relationship between the data provided and fall bird migration?**
- A.** When average monthly temperatures begin to decrease, it means migration should begin.
 - B.** When average monthly temperatures are constant, it means migration should begin.
 - C.** When the temperatures are highest for the year, it means migration should begin.
 - D.** When the temperatures are above or below the shaded region indicating average temperature, it means migration should begin.
- 12. Based on the jet stream map, how does the weather north of the jet stream affect the fall bird migration?**
- M.** The weather is warm and will delay migration.
 - P.** The weather is stormy and will prevent migration.
 - R.** The weather is colder and will trigger early migration.
 - S.** The weather is warmer and sunny and will delay migration.

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Questions 13 – 16 refer to the passage(s) and image(s) shown.

Bird Migration – Part 2

The Tennessee warbler is a migrating bird. The warbler has been seen in coffee plantations in Central America in the fall. The warbler returns in the spring and summer to taiga forests in North America. The warbler’s diet consists mainly of insects. The insects can be found on the leaves of trees and shrubs.

The tables show the climate and weather conditions in North American taiga forests and in Central American countries.

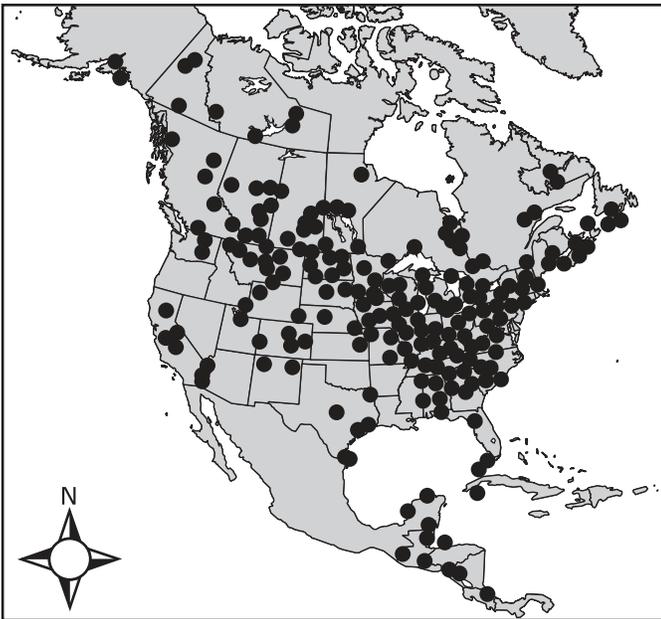
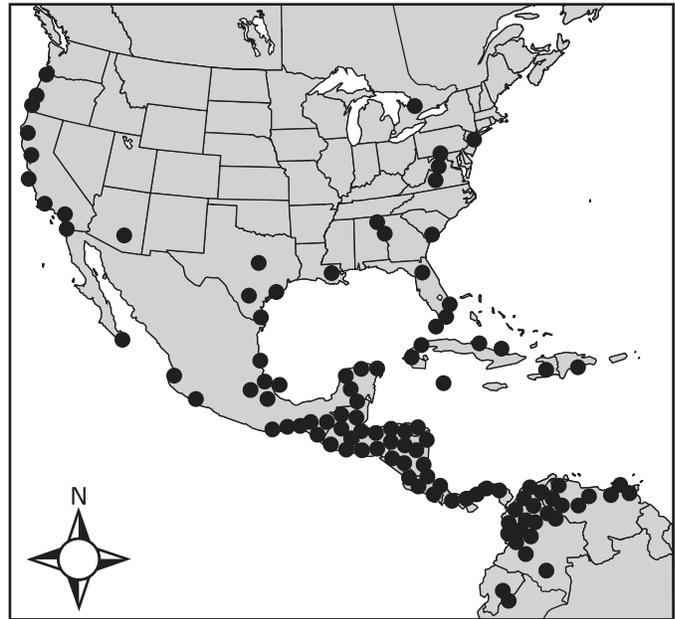
Average Temperatures and Precipitation for Taiga Forests in North America

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Average Temperature (°F)	–18	–13	–4	14	30	41	59	50	41	37	5	–11
Average Precipitation (inches)	0.5	0.6	0.6	0.7	1.0	1.8	2.0	2.2	2.0	1.8	1.0	0.6

Average Temperatures and Precipitation for Countries in Central America

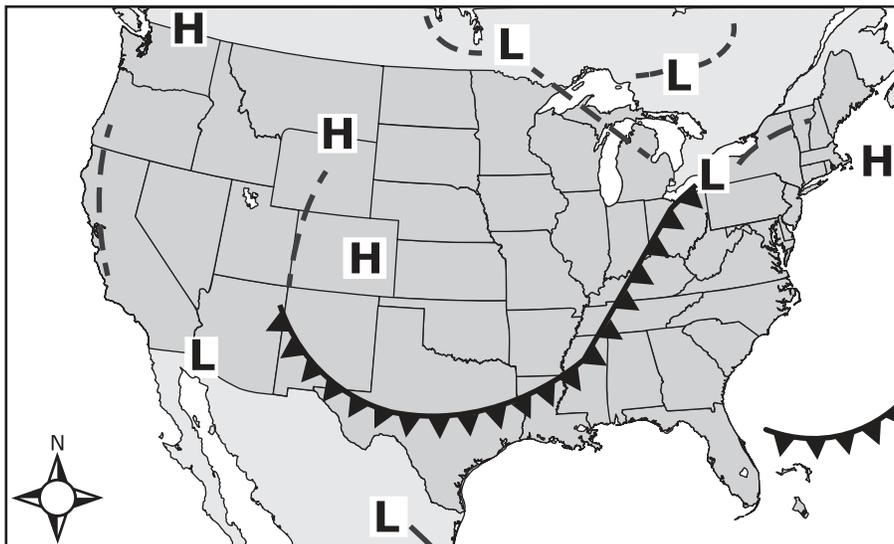
Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Average Temperature (°F)	65	65	66	68	72	70	68	68	68	68	67	65
Average Precipitation (inches)	3.1	1.0	0.8	1.1	5.4	9.4	8.5	8.5	9.6	9.4	3.9	2.4

The sightings of the Tennessee warbler have been tracked and placed on two maps to indicate where the warbler lives throughout the year. Map 1 shows sightings of the Tennessee warbler in the summer. Map 2 shows sightings of the Tennessee warbler in the winter.

Map 1: Summer**Map 2: Winter**

In the migratory journey of birds like the Tennessee warbler, there are many abiotic and biotic factors that can delay birds as they journey to their destination. In the weather map shown, there are weather situations that can cause changes or delays in the migratory journey.

Weather Map of the United States



- 13. Which factor is the primary trigger for the Tennessee warbler migrating south to Central America?**
- A.** abundant food sources
 - B.** cold temperatures
 - C.** increased habitat
 - D.** moderate precipitation
- 14. Based on the data on the taiga forests, which change could possibly affect the warblers if a spring season brought daily temperatures higher than 70°F?**
- M.** The warblers will move toward the coast because the temperatures will be stable near the water.
 - P.** The warblers will move farther north because they require a cooler range of temperatures to survive.
 - R.** The warblers will remain in the same place because they will adapt to the changing temperatures.
 - S.** The warblers will decrease in number because there are few birds that can adapt to the higher temperatures.

- 15. Based on Map 1 and Map 2, which statement correctly describes the average weather for the locations while the Tennessee warblers are there?**
- A.** The temperatures are very high with large amounts of rain.
 - B.** The temperatures are very cold with thunderstorms.
 - C.** The temperatures are between 50°F and 65°F with little precipitation.
 - D.** The temperatures are decreasing from 80°F to 90°F with increasing precipitation.
- 16. Based on the weather map of the United States, which statement best describes the effects of the weather on the warbler migration to the taiga forests?**
- M.** The high-pressure areas will bring rains to prevent migration because birds are unable to fly in rain.
 - P.** The low-pressure areas will speed up migration because there is great wind movement to help birds with flying.
 - R.** The areas behind the cold front will slow migration down because there is little movement of the atmosphere to help birds with flying.
 - S.** The cold front will delay the migration because the temperatures are below the birds' temperature range, which stops birds from flying through the area.

- 17. In some parts of Hawaii, nonnative grasses have been planted for cattle feed, replacing some of the native rain forest plants.**

Which statement describes the most likely impact of the replacement of rain forest plants with nonnative grasses?

- A.** The biodiversity of these areas will decrease.
- B.** Rain forest plants will outcompete nonnative grasses for resources.
- C.** Less nitrogen will be absorbed from the atmosphere over these areas.
- D.** Cattle will get fewer nutrients grazing on nonnative grasses than on rain forest plants.

- 18. Energy from the wind is used to turn windmills. These windmills then spin a generator and produce electricity.**

Which statement would not support the claim that wind energy is considered a clean, renewable resource?

- M.** Wind energy is produced naturally.
- P.** Wind energy is used without giving off greenhouse gases.
- R.** There is an abundant supply of wind energy available for use.
- S.** There are only certain places that are suitable for collecting wind energy.

19. Kudzu is an invasive vine plant in Tennessee. The list shown describes some characteristics of the kudzu plant.

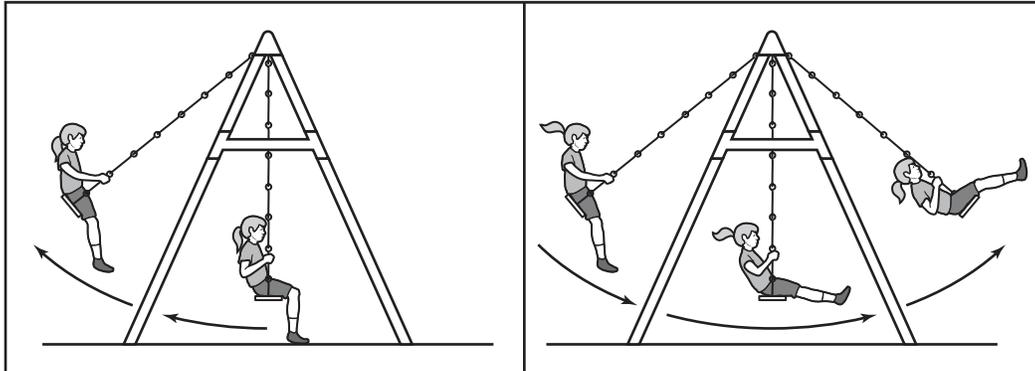
Kudzu Characteristics

Kudzu is a decorative plant.
Kudzu grows at a rate of 30 centimeters per day.
Kudzu grows on top of other trees and plants.
Kudzu damages or kills the plants that it grows on top of.

People are trying to find ways to control the growth of kudzu. Which three methods would best reduce the spread of kudzu in Tennessee?

- A. Water the trees that kudzu grows on top of more often.
- B. Use chemicals that slow down the growth of kudzu.
- C. Add insects that feed only on kudzu to the ecosystem.
- D. Dig up the roots of kudzu plants.
- E. Use fertilizers on kudzu plants.

20. This is a diagram of a system that includes a girl and Earth. In the first picture, the girl sits on the motionless swing. Then she pushes herself backwards. In the second picture, the girl moves forward on the swing. The swing moves the girl back and forth.

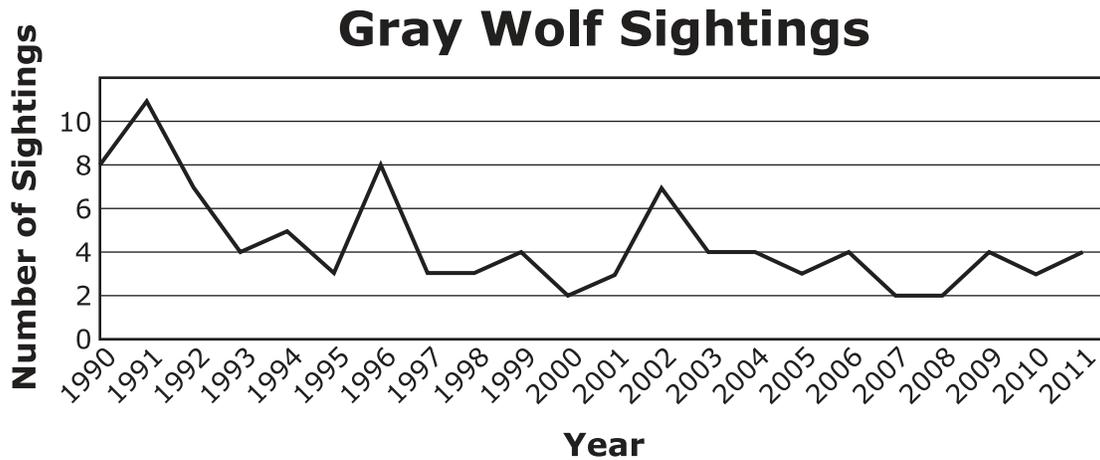


Which of these **best** describes when the system has the greatest gravitational potential energy?

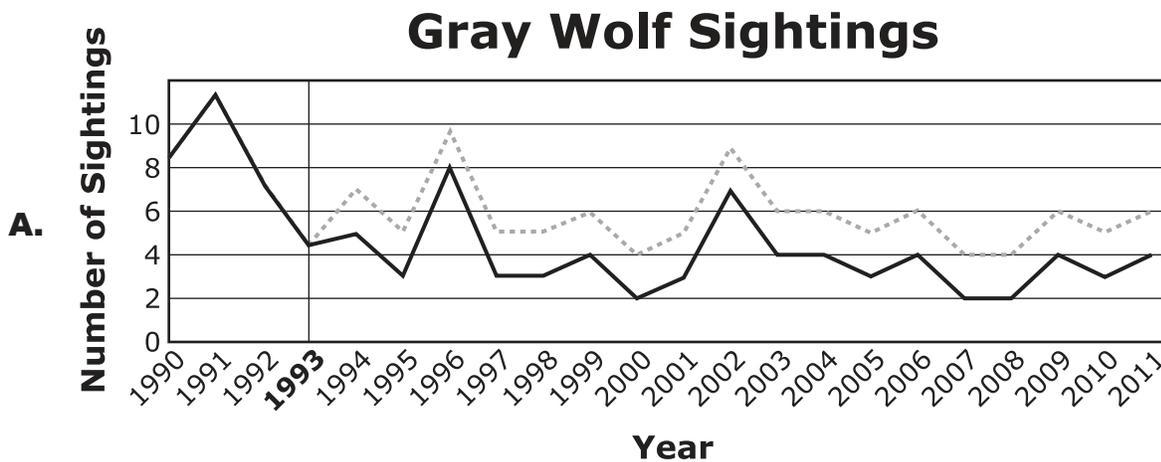
- M.** when the girl is seated on the motionless swing
- P.** when the swing is at its highest point above the ground and begins moving down
- R.** when the swing is at its lowest point above the ground and begins moving up
- S.** when the swing is moving at a constant speed

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21. Gray wolves are carnivores that feed on mice, rats, and rabbits. The graph shows the number of gray wolf sightings each year in an area of open brushland. The data for this graph were collected by hunters. The hunters counted how often they saw gray wolves while they were hunting. These data can be used to estimate the population size of the gray wolves in the area.

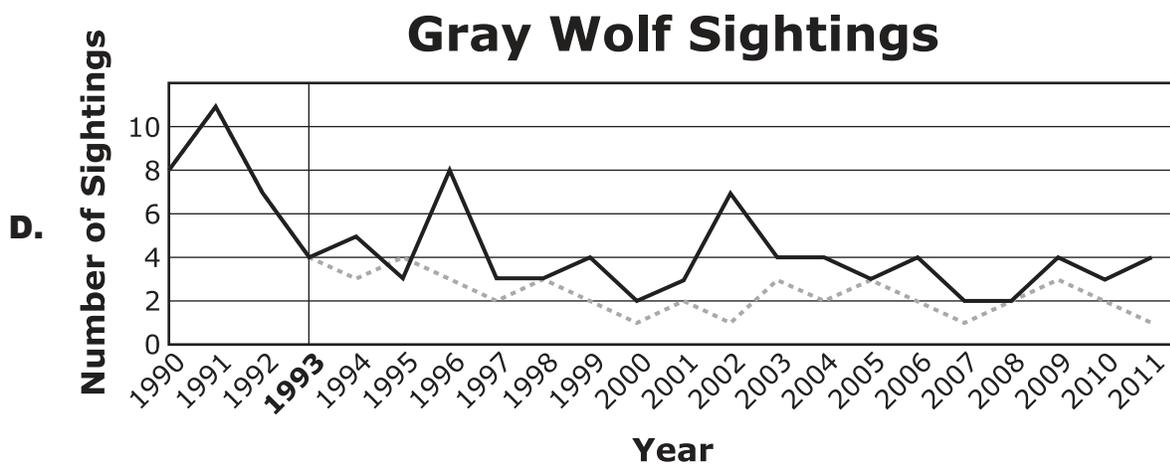
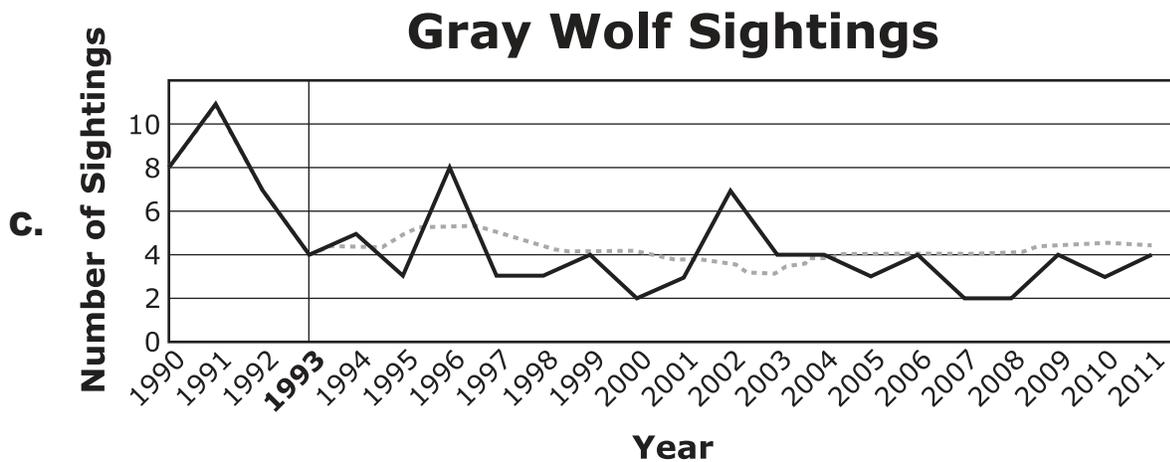
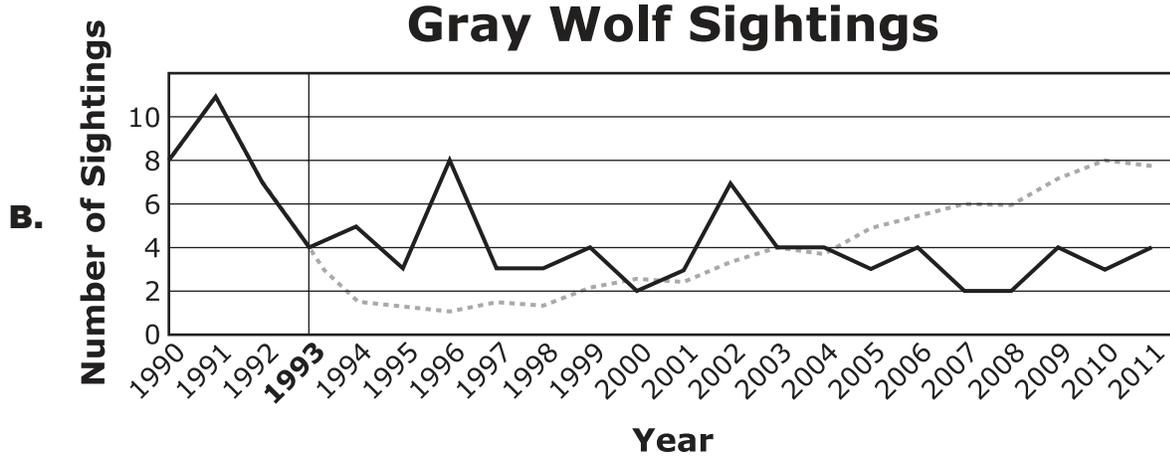


Which graph correctly shows how the number of gray wolf sightings would change if more rabbits were available beginning in 1993?

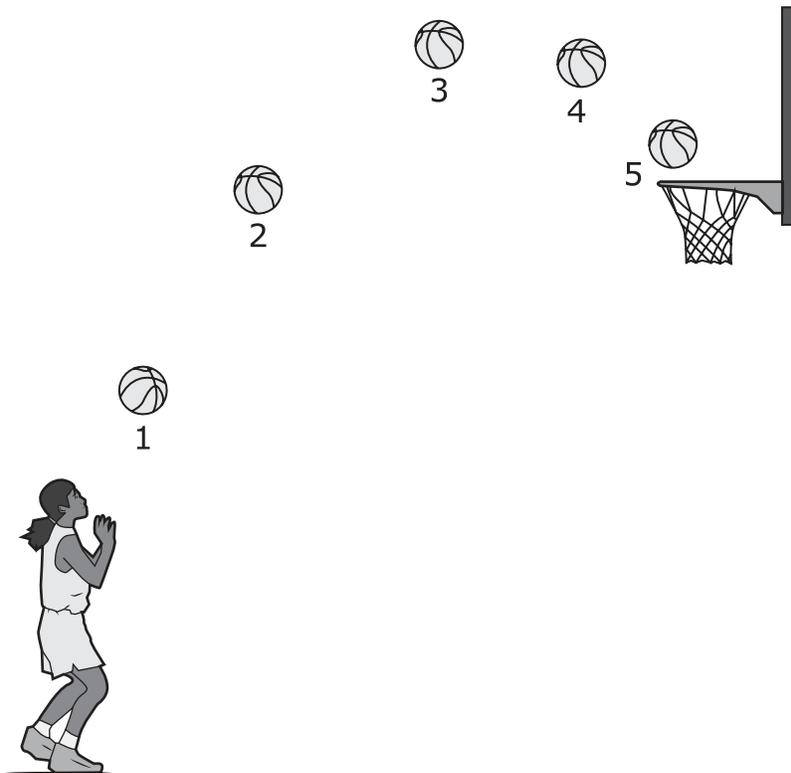


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22. After playing basketball, two students draw a diagram of the basketball's motion when being thrown toward the basket. In the diagram shown, the ball is at its highest point at position 3.



Which two of these correctly describe the transformations of energy at each of the positions in the diagram?

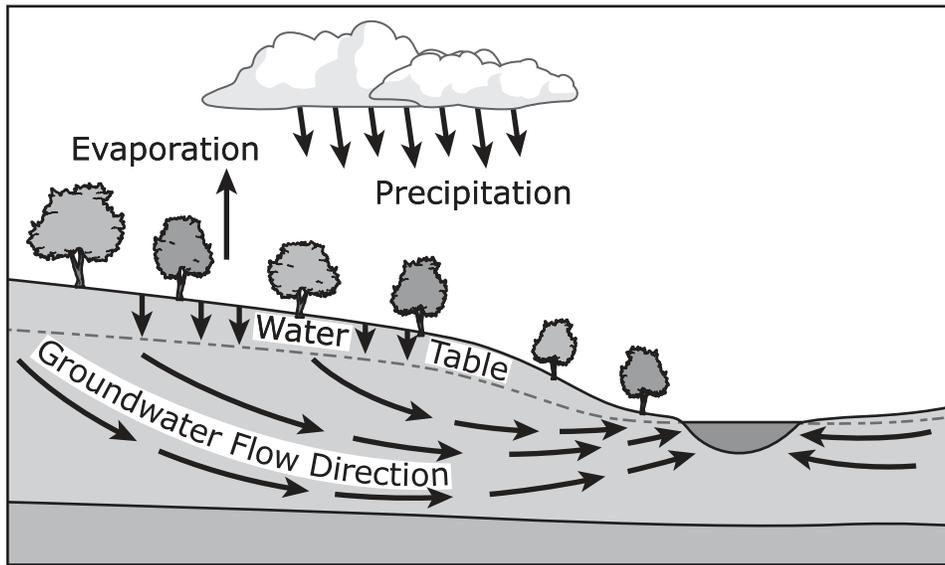
- M. Position 1: Kinetic energy is decreasing and potential energy is increasing.
- P. Position 2: Kinetic energy is increasing and potential energy is decreasing.
- R. Position 3: Kinetic energy is increasing and potential energy is increasing.
- S. Position 4: Kinetic energy is decreasing and potential energy is increasing.
- T. Position 5: Kinetic energy is increasing and potential energy is decreasing.

- 23. A region includes a coastal wetland area. The wetland is a habitat for many types of wildlife. Members of the community surrounding the wetland design a plan that has two goals. The first goal is to provide recreation opportunities for humans in the wetland. The second goal is to protect the biodiversity of wildlife living there.**

Which plan will best meet both goals?

- A.** Drain water from the wetland to make dry hiking trails and relocate fish to a nearby lake.
- B.** Pave part of the wetland for a parking lot and build a visitor center with cabins for overnight guests.
- C.** Construct observation decks over the wetland and build docks for catch-and-release fishing.
- D.** Drain part of the wetland to construct a sports field and use the remaining water area as a harbor for boats.

24. A diagram of the hydrologic cycle is shown.



People drill water wells for their homes above the water table. As more homes are built, the number of wells increases. When the amount of water pumped out is greater than the amount that is replaced, the existing water cycle can be disrupted.

Which two effects will drilling many wells have on the existing hydrologic cycle?

- M. Drilling many wells will lower the water table.
- P. Drilling many wells will speed up the water cycle.
- R. Drilling many wells will cause water to evaporate faster.
- S. Drilling many wells will prevent water from entering the ground.
- T. Drilling many wells will cause less water to flow into lakes and streams.

- 25. Scientists are investigating how solar energy can be used along with other energy sources.**

Which of these best describes why scientists are exploring the use of other types of renewable energy sources along with solar energy?

- A.** The collection of solar energy is limited to daylight hours.
 - B.** Solar energy can be transformed only into electrical energy.
 - C.** The collection of solar energy requires constant monitoring.
 - D.** Solar energy is less popular than other types of energy.
- 26. To decrease air pollution, a city began limiting the number of air-polluting particles companies were able to release into the air. The companies were required to use control devices that catch air-polluting particles. The companies' processes were also changed so that the lowest possible amounts of polluting particles were released.**

Tests show that these new city rules have not decreased the levels of acid rain. Which activity is most likely the reason that implementing these rules did not reduce acid rain levels?

- M.** The number of companies in the city has decreased.
- P.** The number of parks and green spaces in the city has increased.
- R.** The number of families moving into the city has decreased.
- S.** The number of automobiles and traffic jams has increased.

Questions 27 – 30 refer to the passage(s) and image(s) shown.

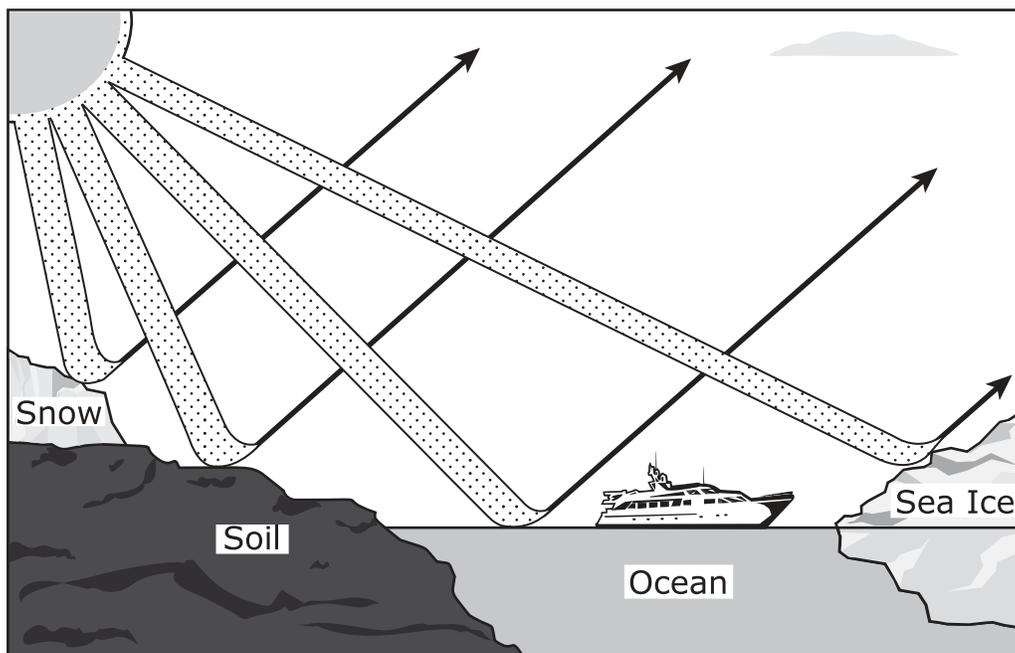
Glaciers – Part 1

Scientists conducting research in Antarctica want to learn how ocean currents form below sea ice, even when there is little sunlight. The scientists know that temperature differences can help cause ocean current formation. The table shows the amount of light Antarctica receives during the summer and winter.

Hours of Sunlight in Antarctica

Season	Hours of Sunlight
Winter	Less than 5
Summer	20 or more

The scientists measure how much sunlight is reflected off different surfaces in Antarctica. The amount of light that reflects off a surface is called the albedo. A surface that reflects all sunlight that reaches it has 100% albedo. A surface that does not reflect light at all has 0% albedo; all the sunlight reaching the surface is absorbed. The diagram shows the albedo of different surfaces in Antarctica.



Surface Albedo

Surface	Albedo (percentage reflected)	Percentage Absorbed
Snow	90%	10%
Soil	20%	80%
Ocean	6%	94%
Sea Ice	60%	40%

27. Which source of thermal energy is responsible for melting the sea ice?

- A.** The ocean heats the sea ice through chemical energy transfer.
- B.** The wind heats the sea ice through mechanical energy transfer.
- C.** The sun heats the sea ice through radiation energy transfer.
- D.** The sea salt heats the ice through electrical energy transfer.

28. Which statement correctly compares the albedo of different surfaces?

- M.** Snow absorbs more thermal energy than ocean water because it has a higher albedo than ocean water.
- P.** Soil absorbs more thermal energy than sea ice because it has a higher albedo than sea ice.
- R.** Ocean water absorbs less thermal energy than soil because it has a lower albedo than soil.
- S.** Sea ice absorbs less thermal energy than ocean water because it has a higher albedo than ocean water.

- 29. Which statement about the albedo of ocean water and sea ice in the summer is correct?**
- A.** The low albedo of ocean water means the heated water will sink and form ocean currents.
 - B.** The albedo of sea ice is lower than the albedo of ocean water, leading to the melting of sea ice.
 - C.** Sea ice absorbs less radiation, making it warmer than ocean water.
 - D.** Ocean water absorbs more radiation and is warmer than sea ice.
- 30. How will a decrease in average summer sea ice affect the mixing of surface water and deep ocean currents?**
- M.** More sunlight will be absorbed, which will heat the surface water and increase the chance that surface water will mix with deep water.
 - P.** Less sunlight will be absorbed, which will cool the surface water and increase the chance that surface water will mix with deep water.
 - R.** More sunlight will be absorbed, which will heat the surface water and reduce the chance that surface water will mix with deep water.
 - S.** Less sunlight will be absorbed, which will cool the surface water and reduce the chance that surface water will mix with deep water.

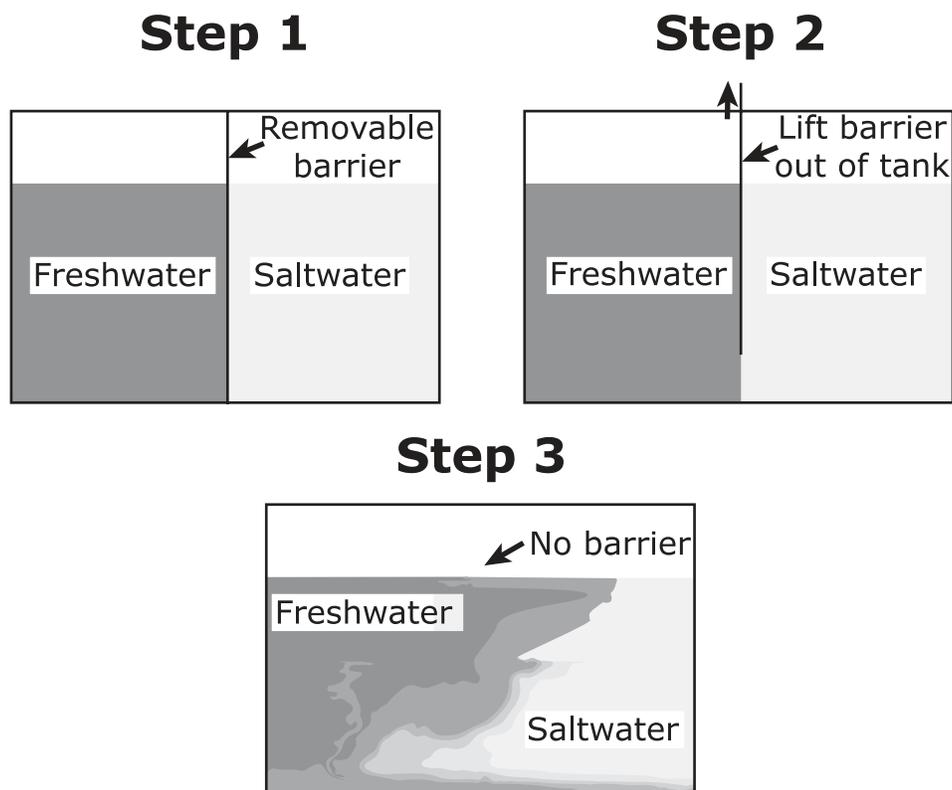
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Questions 31 – 33 refer to the passage(s) and image(s) shown.

Glaciers – Part 2

In the winter, seawater evaporates and precipitates as snow on top of sea ice. The snow freezes and the sea ice becomes thicker. When the water evaporates from the sea, it leaves behind saltier water because the salt does not evaporate. As a result, icebergs and sea ice are freshwater bodies. Sea ice has an albedo of about 60%. Therefore, sea ice reflects about 60% of the sun's radiation and absorbs about 40%. In the summer, the ice begins to crack and pieces of it fall into the ocean. When a piece of sea ice falls into the sea, it melts. Since the sea ice is freshwater, it results in a concentration of freshwater on the surface of the ocean near the sea ice.

The students want to investigate how the cycle of sea ice formation helps make ocean currents. In their investigation they build a model. The model is a fish tank that contains freshwater and saltwater separated by a removable barrier. The freshwater has blue food coloring in it and the saltwater has yellow food coloring in it. At Step 1 the barrier is in place and the different types of water are separated. During Step 2 the barrier is quickly removed. Step 3 shows the water mixing immediately after the barrier has been removed.



- 31. Which argument supports the evidence from Step 3 of the investigation?**
- A.** Freshwater is rising because it has a higher albedo.
 - B.** Freshwater is rising because it is colder.
 - C.** Saltwater is sinking because its volume is increasing.
 - D.** Saltwater is sinking because it is more dense.
- 32. Based on the investigation, which effect does the salt concentration of seawater have on ocean currents?**
- M.** Ocean currents are the strongest when the salt concentration difference between freshwater and saltwater is greatest.
 - P.** Ocean currents are the strongest when the salt concentration of seawater is lowest.
 - R.** Ocean currents are the strongest when freshwater meets another body of freshwater.
 - S.** Ocean currents are the strongest when the difference in albedo of saltwater and freshwater is greatest.

33. How can the investigation be improved to more accurately represent how sea ice melts in the Antarctic?

- A.** Use a bigger tank because adding more water will change the way the saltwater moves.
- B.** Use less freshwater because melted sea ice has less volume than saltwater in the ocean.
- C.** Use warmer saltwater because the saltwater in the Antarctic is warmer than the freshwater.
- D.** Use soil at the bottom of the fish tank because the soil will decrease the albedo of the water.

- 34. Vast quantities of natural gas are located beneath Earth's surface. Natural gas is less costly to extract from the ground than crude oil. Natural gas offers some advantages compared to other energy sources.**

Despite the large amounts of natural gas, why is it classified as a nonrenewable, rather than a renewable, resource?

- M.** Natural gas is available underground but not in the atmosphere.
- P.** The formation of natural gas is a process that takes millions of years.
- R.** Natural gas can be extracted only during certain times of the year.
- S.** The cost of extracting natural gas from the ground is greater than its value.

- 35. Recently, severe weather damaged forests in northern New Mexico. Trees in these forests are nesting sites for Mexican spotted owls. Damage to the forests caused populations of Mexican spotted owls to decline in the state.**

Which of these describes the most likely result of a decrease in the number of Mexican spotted owls in New Mexico forests?

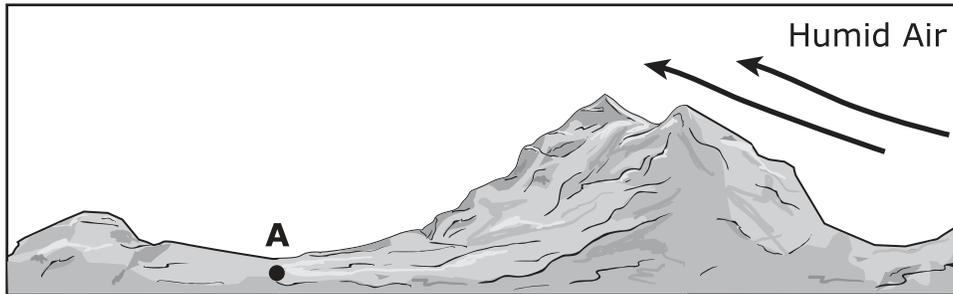
- A.** Populations of primary consumers increased, because there was less predation by Mexican spotted owls.
- B.** Populations of predators decreased, because there was less competition from Mexican spotted owls.
- C.** Deciduous trees grew at faster rates, because fewer Mexican spotted owls were nesting in their branches.
- D.** Certain herbaceous plants reproduced at a slower rate, because fewer Mexican spotted owls flew above them.

36. Students are planning investigations to help them understand the movement of thermal energy between objects.

Which of these investigations should the students plan to help them better understand conduction?

- M.** Compare the difference in temperatures between a small amount of wet sand in direct sunlight and the same amount of wet sand in shade.
- P.** Observe how different temperatures of water move through an aquarium when food coloring has been added to the water.
- R.** Measure the changes in temperature of materials that have different colors when the materials are left in sunlight.
- S.** Compare the changes in temperature of different objects that are heated by a hot plate set to a medium setting.

37. A student studies the diagram shown. The arrows in the diagram represent a typical flow of wind over a mountain.

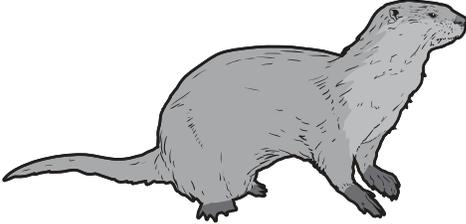
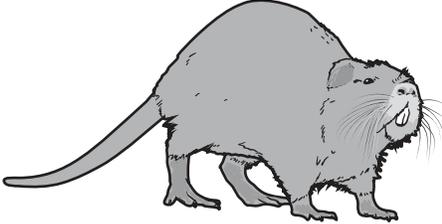


The student correctly explains the expected atmospheric conditions in the diagram. Which three statements should be part of the student's explanation?

- A. Warm air rises up the mountain.
- B. Rain occurs often at location A.
- C. The humid air travels up the mountain and falls back down the other side.
- D. Location A is a dry location.
- E. The humid air cools as it is rising to the top of the mountain and turns to clouds.

38. The data table shown contains information about two mammals that have overlapping niches in Tennessee.

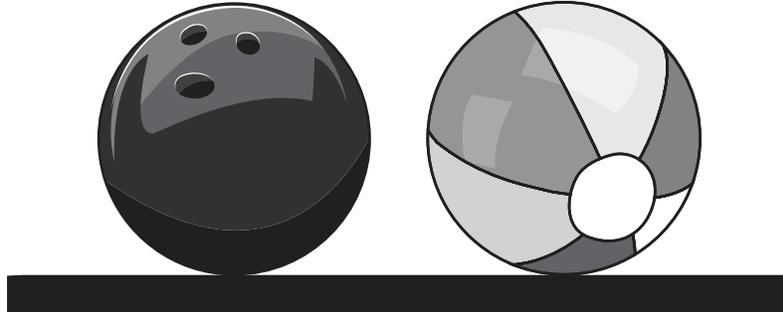
Tennessee Mammals

	 North American River Otter	 Coypu
Status	Native	Invasive
Habitat	Rivers, streams, lakes	Streams, rivers, marshes
Food	Fish and crayfish	Water and land plants
Reproduction	1 litter of 2 – 4 young per year	2 litters of 4 – 6 young per year

Coypu damage riverbanks, trample crops, and reduce the amount of food available to other native herbivores. Based on the information in the data table, which strategy for controlling the coypu population would have the least effect on the North American river otter?

- M.** Place poison on plants along marshes that will affect only coypu.
- P.** Introduce a new carnivore to the rivers and streams.
- R.** Set traps for coypu made of cages and trapdoors along the rivers and streams.
- S.** Increase the number of water plants in the habitat that coypu eat.

39. A beach ball and a bowling ball were sitting on a shelf. Someone bumped the shelf and the bowling ball and beach ball rolled off the shelf at the same time. They both hit the ground at the same time and had the same speed.



Which of these statements correctly compares the kinetic energy of the two objects just before they hit the ground?

- A. The bowling ball had more kinetic energy because it had less potential energy when it was on the shelf.
- B. The bowling ball had more kinetic energy because it has more mass.
- C. Both balls had the same kinetic energy because they had the same speed.
- D. Both balls had the same kinetic energy because they had the same potential energy when they were on the shelf.

40. **Animals have different methods of communication with members of their own species and other types of animals.**

<p>Alligator</p> 	<p>Attracts female alligators by making noises</p> <p>Warns others of danger with a deep sound</p>
<p>Red Squirrel</p> 	<p>Makes noise to frighten intruders</p> <p>Warns others of danger with high-pitched noises</p>
<p>Whitetail Deer</p> 	<p>Communicates through scent to attract a mate</p> <p>Makes a whistle sound when afraid</p>
<p>Wolf</p> 	<p>Shows dominance by staring at other animals</p> <p>Barks or growls when it senses danger</p>

Which three statements about animal communication are supported by the information in the data table?

- M.** Wolves, squirrels, and deer wave their tails to attract a mate.
- P.** Alligators and deer use communication to help them reproduce.
- R.** Squirrels, deer, and wolves make noises to warn others of danger.
- S.** Wolves use body language to scare away enemies.
- T.** Alligators and squirrels leave traces on trees for their own species.

41. A student attached a rubber band to a toy truck. When the student stretched and released the rubber band, the truck began to move. The student stretched the rubber band by different distances. Then the student recorded the speed of the truck in the table shown.

Toy Truck Data

Trial	Distance Rubber Band Stretched (cm)	Speed of Truck (m/s)
1	3	2
2	6	4
3	9	6
4	12	8

Which statement is best supported by the data in the table?

- A. When the distance the rubber band stretched was doubled, the speed of the truck doubled.
- B. When the distance the rubber band stretched was doubled, the speed of the truck tripled.
- C. When the distance the rubber band stretched was tripled, the speed of the truck was reduced by half.
- D. When the distance the rubber band stretched was tripled, the speed of the truck increased by three meters per second.

42. A species of moth inhabits the fur of three-toed sloths. These moths provide nutrients to algae growing on the sloth's fur. The algae provides camouflage for the sloth. The sloth's waste provides a secure and nutrient-rich place for the moths to lay their eggs.



Populations of three-toed sloths are decreasing due to deforestation of their habitat. Which of these will most likely result if the three-toed sloth population continues to decline?

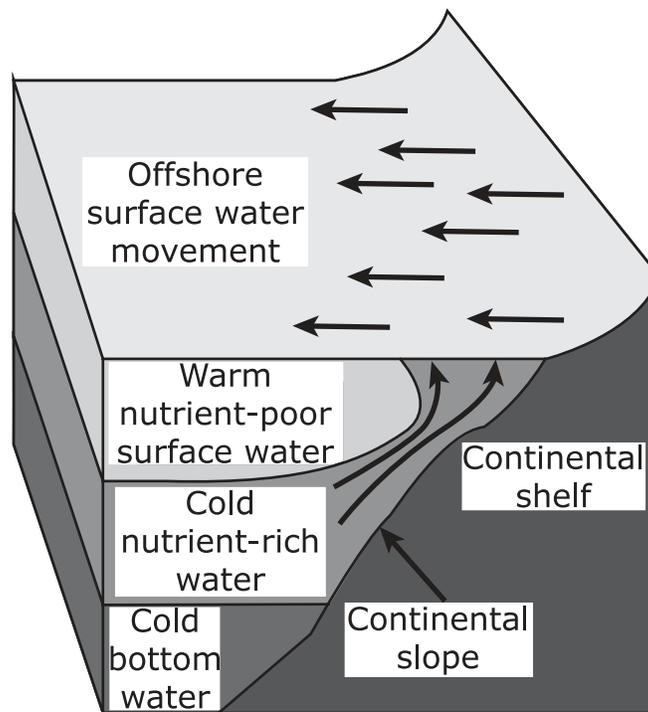
- M.** The population of moths will thrive by inhabiting the fur of another tree-dwelling mammal.
- P.** The algae will adapt to living on tree trunks and low-hanging branches.
- R.** The population of moths will decline because of fewer places to lay eggs.
- S.** The algae will survive by breeding with another photosynthetic organism.

Questions 43 – 45 refer to the passage(s) and image(s) shown.

What Happened to the Anchovy? – Part 1

The cold ocean waters off the coast of Peru, a country in South America, are some of the most nutrient-rich waters in the world. An ocean current named the Humboldt Current helps bring cold water up the western coast of South America from the Antarctic. This cold water can hold more oxygen than warm water can. As wind patterns push surface water away from the shore, deep water full of nutrients rises to the surface. This is called upwelling. The diagram shows how upwelling occurs.

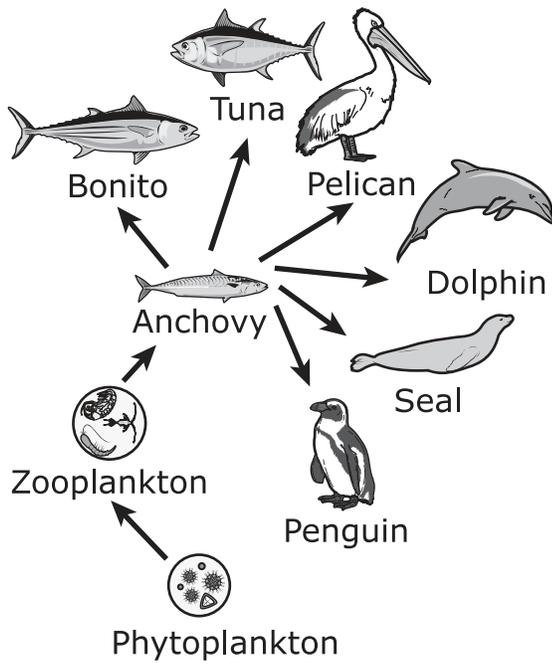
Underwater View of Upwelling



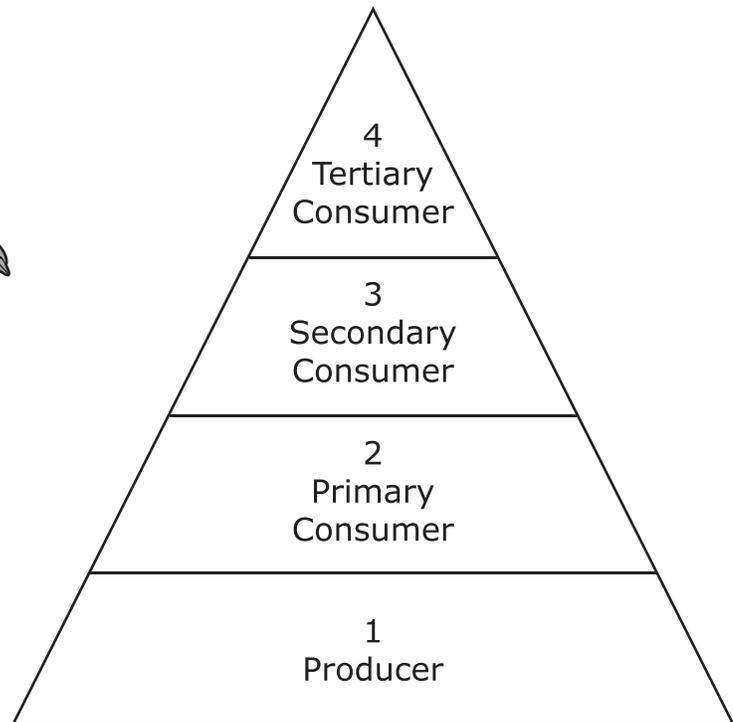
A small fish called the anchovy can be found in the cold ocean waters off the coast of Peru. The anchovy population in Peru is one of the most important fish populations in the world.

The anchovy is critical to the health of the ocean ecosystem off the coast of Peru. Changes to the anchovy population have a major impact on other organisms in the ecosystem. A food web for that ecosystem is shown. This food web shows the relationships among organisms, including anchovies, in the ecosystem. It also shows the movement of energy through the ecosystem. A basic energy pyramid is shown as well.

Peruvian Ocean Food Web



Energy Pyramid



- 43. Which statement is most correct about the collapse of the ocean food web that may be caused by the loss of an organism in the ecosystem?**
- A.** The loss of the large fish would mean that there would not be a need for the anchovies as a food source.
 - B.** The loss of the zooplankton would mean that there would not be a direct food source for the phytoplankton.
 - C.** The loss of the anchovies would mean that larger fish would not have enough food to thrive in that region.
 - D.** The loss of the phytoplankton would mean that the anchovy would not have phytoplankton as a direct food source.
-
- 44. According to the food web, in which trophic level of the energy pyramid does the anchovy belong?**
- M.** 1: Producer
 - P.** 2: Primary Consumer
 - R.** 3: Secondary Consumer
 - S.** 4: Tertiary Consumer

- 45. Which factor makes the ocean off the coast of Peru one of the best ecosystems for sustaining the largest fish populations in the world?**
- A.** the cold waters traveling up the coast of South America with large amounts of nutrients needed in the ecosystem
 - B.** the cold winds from the equator bringing nutrients from the western oceans needed in the ecosystem
 - C.** the warm waters from the western oceans that bring large amounts of nutrients needed in the ecosystem
 - D.** the warm winds that move the nutrients needed in the ecosystem to the coastal areas

Questions 46 – 49 refer to the passage(s) and image(s) shown.

What Happened to the Anchovy? – Part 2

Natural events and human activity can threaten the health of the anchovy population off the coast of Peru. El Niño events are natural events that occur about every two to seven years. During these events, lower air pressure over South America results in changes to wind patterns. Normally winds blow from east to west, pushing surface water away from the coast of Peru. During El Niño events, winds blow from west to east. This pushes warm surface water toward Peru's coast. The warm surface water contains less oxygen than cold water and blocks upwelling from bringing nutrients to the surface.

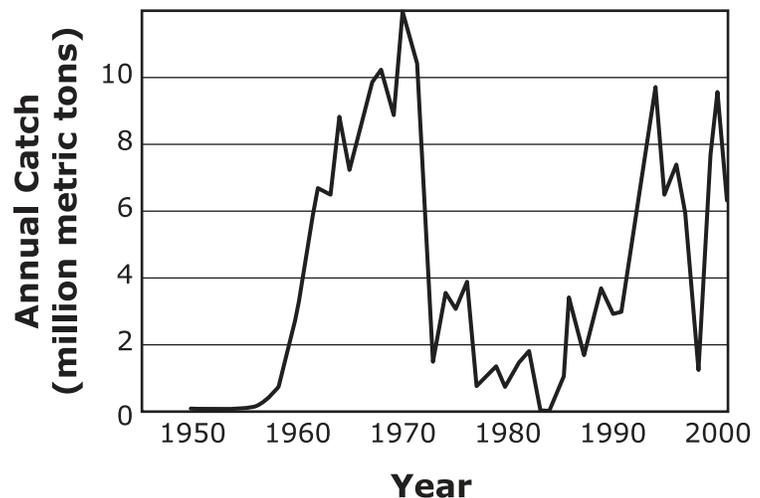
Commercial fishing is a human activity that harvests millions of tons of anchovies each year. In the 1970s, the fishing industry recognized the need to protect both the anchovies and the ocean ecosystem. As a result, the government set limits on the amount of anchovies a fishing boat could catch each year.

The list shows the years in which El Niño events were the strongest. The graph shows the amount of anchovies caught off the coast of Peru each year.

Strong El Niño Events 1950 – 2000

1957 – 1958
1965 – 1966
1972 – 1973
1982 – 1983
1987 – 1988
1991 – 1992
1997 – 1998

Annual Catch of Peruvian Anchovy



- 46. Which statement describes the human activity that most impacts the Peruvian anchovy population?**
- M.** Overfishing the plankton increases the amount of food left for anchovies.
 - P.** Tourists in boats feeding the anchovies extra food reduces the anchovy population.
 - R.** Using the anchovies for fish meal instead of food reduces the amount of food available to humans.
 - S.** Fishing for the anchovies every year reduces the number of anchovies available to reproduce.
- 47. Which solution would best reduce the impact humans have on the anchovy ecosystem when upwelling is reduced off the coast of Peru?**
- A.** Add more nutrients to the water because there are fewer natural nutrients.
 - B.** Suspend fishing in the ecosystem because it will let the populations stabilize.
 - C.** Harvest only the adult anchovies because the smaller anchovies will be able to survive with less food.
 - D.** Import fish from similar ecosystems to increase the amount available for fishing.

48. Why should the number of tons of anchovies captured per boat each year be limited?

- M.** The anchovy population needs to repopulate to prevent extinction.
- P.** Every fishing boat needs to harvest equal amounts to stabilize the industry.
- R.** The habitat must be managed to allow nutrients to rise to the surface during El Niño events.
- S.** Anchovy prey will become endangered if their main food source decreases.

49. Based on the evidence provided, which factors most influenced the number of anchovies caught in 1984?

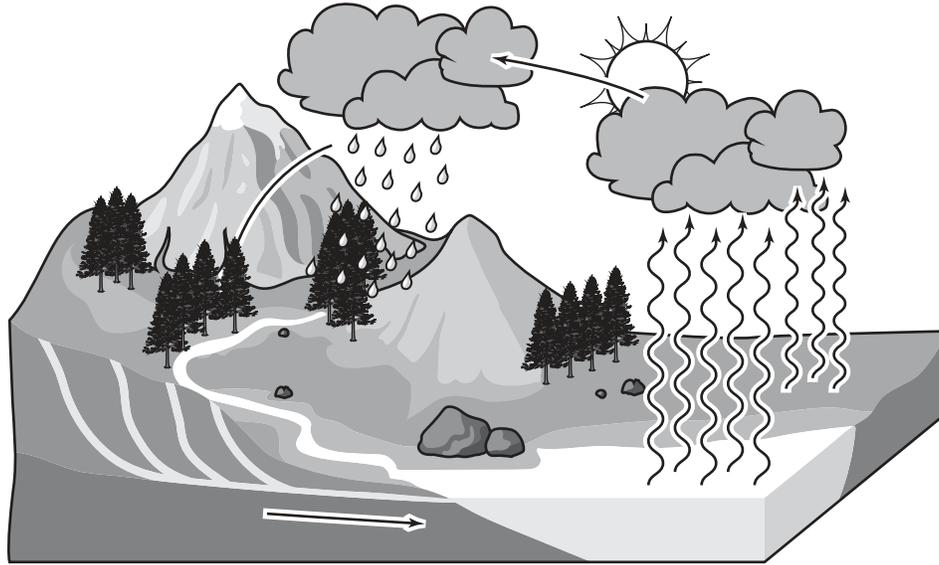
- A.** overfishing in previous years and warm waters with few nutrients
- B.** movement of anchovies to other waters and fishing of large fish
- C.** conservation of anchovies and habitat management
- D.** warm winds and low-pressure areas

- 50. Traditional farming practices can increase soil erosion. Eroded soils can affect nearby lakes by causing eutrophication. Eutrophication decreases the water quality of a lake by reducing the amount of oxygen in the water.**

Which statement describes the best solution for a farmer to increase the biodiversity of a nearby lake?

- M.** The farmer removes more retaining walls that control runoff.
- P.** The farmer increases the amount of time that cows graze on grasses each day.
- R.** The farmer uses more fertilizer when growing new crops.
- S.** The farmer plants a variety of trees along his fields.

51. The diagram represents the hydrologic cycle in a particular area.



Which of these would be the best way to measure the effect that removing many trees in the area would have on the hydrologic cycle?

- A. Evaluate the growth of new plants in the area before and after the trees are removed.
- B. Measure and compare the speed and direction of wind in the area before and after the trees are removed.
- C. Survey the people living in the area to determine if they use more water before or after the trees are removed.
- D. Measure and compare the amounts of precipitation and surface water runoff in the area before and after the trees are removed.

52. Students record the mass, speed, and kinetic energy of objects moving along a track. The students create these data tables.

Data Set 1

Mass (kg)	Speed (m/s)	Kinetic Energy (J)
2.0	8.0	64.0
2.0	4.0	16.0
2.0	2.0	4.0
2.0	1.0	1.0

Data Set 2

Mass (kg)	Speed (m/s)	Kinetic Energy (J)
8.0	2.0	16.0
4.0	2.0	8.0
2.0	2.0	4.0
1.0	2.0	2.0

Which two statements correctly relate the mass and the speed of an object to its kinetic energy?

- M.** When an object's speed doubles, its kinetic energy doubles.
- P.** When an object's speed doubles, its kinetic energy more than doubles.
- R.** When the mass of an object doubles, its kinetic energy doubles.
- S.** When the mass of an object doubles, its kinetic energy more than doubles.
- T.** When both the speed and the mass of an object double, its kinetic energy doubles.

- 53. Prairie dogs are a type of mammal that lives in colonies. Prairie dogs use a variety of different sounds to communicate with each other. These calls warn neighbors of the approach of a predator. Different calls are used for different types of predators. One type of call is a “jump-yip”; a prairie dog stands on its hind legs, extends its arms, and utters a sharp “yipping” sound. Other prairie dogs then copy this behavior while the rest scurry to safety in their burrows.**

A student researched the different sounds made by prairie dogs. Which question about this “jump-yip” research of prairie dog communication was the student trying to answer?

- A.** Why do prairie dogs use the “jump-yip” behavior?
- B.** What are prairie dogs celebrating when they use the “jump-yip” behavior?
- C.** Why does this “jump-yip” behavior occur only at night?
- D.** Does this “jump-yip” behavior scare the other prairie dogs?



This is the end of the Grade 6 Science test.

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Name: _____

- 1. Ⓐ Ⓑ Ⓒ Ⓓ
- 2. Ⓜ Ⓟ Ⓡ Ⓢ
- 3. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ (select **two**)
- 4. Ⓜ Ⓟ Ⓡ Ⓢ
- 5. Ⓐ Ⓑ Ⓒ Ⓓ
- 6. Ⓜ Ⓟ Ⓡ Ⓢ Ⓣ (select **three**)
- 7. Ⓐ Ⓑ Ⓒ Ⓓ
- 8. Ⓜ Ⓟ Ⓡ Ⓢ
- 9. Ⓐ Ⓑ Ⓒ Ⓓ
- 10. Ⓜ Ⓟ Ⓡ Ⓢ
- 11. Ⓐ Ⓑ Ⓒ Ⓓ
- 12. Ⓜ Ⓟ Ⓡ Ⓢ
- 13. Ⓐ Ⓑ Ⓒ Ⓓ
- 14. Ⓜ Ⓟ Ⓡ Ⓢ
- 15. Ⓐ Ⓑ Ⓒ Ⓓ
- 16. Ⓜ Ⓟ Ⓡ Ⓢ
- 17. Ⓐ Ⓑ Ⓒ Ⓓ
- 18. Ⓜ Ⓟ Ⓡ Ⓢ
- 19. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ (select **three**)
- 20. Ⓜ Ⓟ Ⓡ Ⓢ
- 21. Ⓐ Ⓑ Ⓒ Ⓓ
- 22. Ⓜ Ⓟ Ⓡ Ⓢ Ⓣ (select **two**)
- 23. Ⓐ Ⓑ Ⓒ Ⓓ
- 24. Ⓜ Ⓟ Ⓡ Ⓢ Ⓣ (select **two**)
- 25. Ⓐ Ⓑ Ⓒ Ⓓ
- 26. Ⓜ Ⓟ Ⓡ Ⓢ
- 27. Ⓐ Ⓑ Ⓒ Ⓓ

- 28. (M) (P) (R) (S)
- 29. (A) (B) (C) (D)
- 30. (M) (P) (R) (S)
- 31. (A) (B) (C) (D)
- 32. (M) (P) (R) (S)
- 33. (A) (B) (C) (D)
- 34. (M) (P) (R) (S)
- 35. (A) (B) (C) (D)
- 36. (M) (P) (R) (S)
- 37. (A) (B) (C) (D) (E) (select **three**)
- 38. (M) (P) (R) (S)
- 39. (A) (B) (C) (D)
- 40. (M) (P) (R) (S) (T) (select **three**)
- 41. (A) (B) (C) (D)
- 42. (M) (P) (R) (S)
- 43. (A) (B) (C) (D)
- 44. (M) (P) (R) (S)
- 45. (A) (B) (C) (D)
- 46. (M) (P) (R) (S)
- 47. (A) (B) (C) (D)
- 48. (M) (P) (R) (S)
- 49. (A) (B) (C) (D)
- 50. (M) (P) (R) (S)
- 51. (A) (B) (C) (D)
- 52. (M) (P) (R) (S) (T) (select **two**)
- 53. (A) (B) (C) (D)



1. A B C D
2. M P R S
3. A B C D E (select **two**)
4. A B C D
5. A B C D
6. A B C D E (select **three**)
7. A B C D
8. M P R S
9. A B C D
10. M P R S
11. A B C D
12. M P R S
13. A B C D
14. M P R S
15. A B C D
16. M P R S
17. A B C D
18. M P R S
19. A B C D E (select **three**)
20. M P R S
21. A B C D
22. A B C D E (select **two**)
23. A B C D
24. A B C D E (select **two**)
25. A B C D
26. M P R S
27. A B C D

28. M P R D
29. A B C D
30. M P R S
31. A B C D
32. A P R S
33. A B C D
34. M P R S
35. A B C D
36. M P R D
37. A B C D T (select **three**)
38. A P R S
39. A B C D
40. M P R S T (select **three**)
41. A B C D
42. M P R S
43. A B C D
44. M P R S
45. A B C D
46. M P R D
47. A B C D
48. A P R S
49. A B C D
50. M P R D
51. A B C D
52. M P R S T (select **two**)
53. A B C D

TCAP Practice Test Standards Alignment and Key - Grade 6 Science

Question No.	Key	Standard
1	B	6.LS2.7
2	P	6.LS2.2
3	B, E	6.ESS2.2
4	M	6.LS2.5
5	C	6.ESS2.6
6	M, R, T	6.LS2.1
7	D	6.PS3.4
8	S	6.LS2.6
9	C	6.ESS2.3
10	P	6.LS2.4
11	A	6.ESS2.5
12	R	6.ESS2.5
13	B	6.LS2.4
14	P	6.LS2.4
15	C	6.ESS2.5
16	S	6.ESS2.5
17	A	6.LS4.1
18	S	6.ESS3.1
19	B, C, D	6.LS2.5
20	P	6.PS3.2
21	A	6.LS2.1
22	M, T	6.PS3.2
23	C	6.LS4.2
24	M, T	6.ESS2.4
25	A	6.ESS3.2
26	S	6.LS2.6
27	C	6.PS3.1
28	S	6.PS3.1
29	D	6.ESS2.1
30	R	6.ESS2.1
31	D	6.ESS2.1

Question No.	Key	Standard
32	M	6.ESS2.1
33	B	6.PS3.1
34	P	6.ESS3.1
35	A	6.LS4.1
36	S	6.PS3.4
37	A, D, E	6.ESS2.3
38	M	6.LS2.5
39	B	6.PS3.3
40	P, R, S	6.LS2.7
41	A	6.PS3.2
42	R	6.LS2.2
43	C	6.LS2.3
44	R	6.LS2.3
45	A	6.LS2.3
46	S	6.ESS3.3
47	B	6.ESS3.3
48	M	6.ESS3.3
49	A	6.ESS3.3
50	S	6.LS4.2
51	D	6.ESS2.4
52	P, R	6.PS3.3
53	A	6.LS2.7

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Tennessee Comprehensive
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Science
Grade 6 | Practice Test

