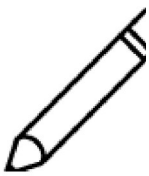
Greatness Grows Here!

Memphis-Shelby County Schools Interim Assessment #1
Fall 2026

Science
Grade 4



INSTRUCTIONS:

Read each question carefully. Look at any graphs, tables, diagrams, or pictures that go with the question. Some questions ask you to choose one answer. Some questions ask you to choose two or three answers; choose exactly the number of answers the question asks for. Two questions have two parts, Part A and Part B; answer both parts of each question. Mark each answer in your test booklet. You may not use a calculator on this test.

1. A student plants a small tree in a large pot of soil. For five years, the student waters the tree but adds no soil or fertilizer. The table shows the student's measurements.

Tree and Soil Measurements

Measurement	At the Start	After 5 Years
Mass of the tree	2 kilograms	70 kilograms
Mass of the dry soil	90 kilograms	89.9 kilograms

Which two statements BEST explain where most of the matter that the tree added came from?

A. The tree's roots took in the soil and turned it into wood.

B. The tree's leaves took in air from around the tree.

C. The tree turned sunlight into the matter in its wood and leaves.

D. The tree's roots took in the water that the student added.

E. The tree made new matter from nothing as it grew.

GO ON

2. Monty was learning about life in the ocean. He made a food chain of some of the organisms he was studying.

Sun → Algae → Krill → Herring → Gull

Scientists set up a large ocean tank with algae, krill, herring, gulls, and jellyfish. They add a harmless marker to the algae. The marker stays in matter, so it shows where the matter from the algae goes. The table shows the first day the marker was found in each living thing.

Marker Results

Living Thing	First Day the Marker Was Found
Algae	Day 0
Krill	Day 3
Herring	Day 10
Gulls	Day 20
Jellyfish	not found by Day 30

Which conclusion is BEST supported by Monty's food chain and all of the results?

A. The gulls took in matter straight from the algae, because the marker reached the gulls as well as the krill.

B. Matter from the algae moved into the krill, then the herring, then the gulls as each was eaten, and the results show no evidence that the jellyfish ate any of them during the investigation.

C. Matter moved from the gulls back to the herring and krill, because the gulls were the last to take in the marker.

D. The Sun added matter to each living thing in turn, so the marker spread from the algae to every living thing in the tank.

GO ON

3. A class sets up three sealed jars. Each jar has the same amount of pond water and gravel. The table shows what else is in each jar, where each jar is kept, and what the class observed after six weeks.

Jar Results

Jar	Living Things in the Jar	Where the Jar Is Kept	After Six Weeks
Jar 1	water plant and two snails	near a sunny window	plant is green and growing; both snails are alive
Jar 2	water plant and two snails	in a dark closet	plant is brown and dead; both snails are dead
Jar 3	two snails, no plant	near a sunny window	both snails are dead

Which explanation BEST accounts for the results in all three jars?

A. The snails get energy directly from light, so the snails in the dark closet could not survive.

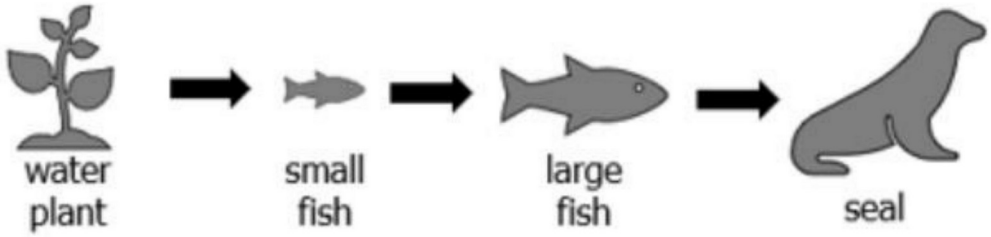
B. The water plant needs the snails for food, so the plant in the dark closet died after the snails died.

C. The snails need the plant for food, and the plant needs light to grow, so the snails depend on light through the plant.

D. The snails need the gravel for food, and the gravel in the dark closet did not get enough light.

GO ON

Examine the food chain.



4. One year, a disease kills most of the water plants in this ecosystem. The next year, there are far fewer seals, even though seals do not eat water plants.

Which two statements BEST explain why the seal population became smaller?

A. The water plant captures energy from sunlight that every animal in this food chain depends on.

B. The seals rest in the sun to get energy, and the water plants gave the seals shade.

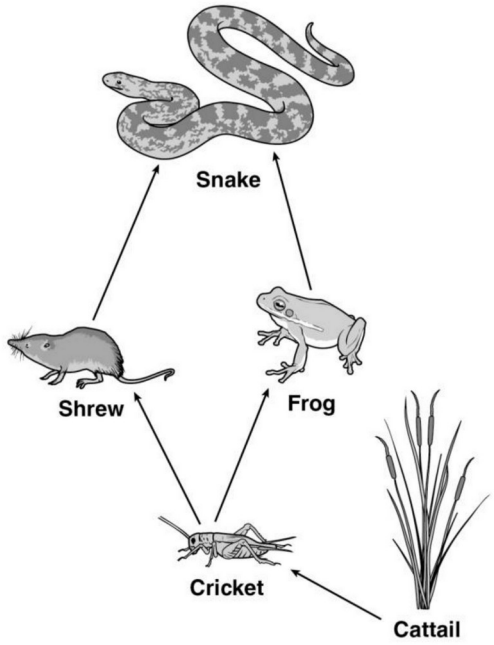
C. The seals began eating water plants when fish were hard to find, so the seals ran out of food.

D. With fewer water plants, fewer small fish got energy, so less food moved up to the large fish and the seals.

E. The small fish make their own energy, so losing the water plants affected only the plants.

GO ON

A food web is shown. A cattail is a type of grassy plant.



This question has two parts. Question 5 is Part A, and Question 6 is Part B.

5. <u>PART A</u>. A spring drought kills most of the cattails. Which change will MOST LIKELY happen next in this food web?

A. The frog population will increase.

B. The cricket population will increase.

C. The shrew population will decrease.

D. The snake population will stay the same.

6. <u>PART B</u>. Which statement BEST explains the answer to Part A?

A. Shrews eat crickets, and crickets depend on cattails for food.

B. Shrews eat cattails, so the shrews lose their food right away.

C. Frogs no longer compete with crickets for cattails, so more frogs survive.

D. Snakes do not eat cattails, so a change to the cattails cannot affect snakes.

7. **A student sets up two containers with the same kind of soil and plants one bean seed in each. In Container 1, the student mixes in dead leaves that have been rotting on the forest floor for several months. Container 2 has no dead leaves. Both containers get the same amount of sunlight. The student waters both containers so that a moisture meter gives the same reading in both containers every day. The table shows the student's results.**

Bean Plant Investigation

What Was Measured or Observed	Container 1 (dead leaves)	Container 2 (no dead leaves)
Soil moisture meter reading each day	damp	damp
Nutrient level from a soil test kit on the day of planting	high	low
What the student saw in the soil after four weeks	white threads of fungus and tiny pieces of broken-down leaves	no fungus
Height of the bean plant after four weeks	24 centimeters	15 centimeters

Which explanation is BEST supported by all of the results?

A. The dead leaves held extra water in the soil, so the bean plant in Container 1 got more water.

B. Fungi and other decomposers broke down the dead leaves, adding nutrients that the bean plant took in from the soil.

C. The dead leaves released chlorophyll into the soil, and the bean plant used the chlorophyll to grow its leaves.

D. The dead leaves kept fungus from growing in the soil, which protected the bean plant in Container 1.

GO ON

8. The Arctic fox lives in the cold, snowy environment of the Arctic. It is a carnivore that usually feeds on small mammals. However, the Arctic fox is also a scavenger that will sometimes follow a polar bear and eat the remains of the bear's kill.

Scientists place the remains of a seal in two areas. Arctic foxes are common in Area 1. A disease has removed most of the Arctic foxes from Area 2. The table shows what the scientists observed.

Seal Remains Observations

Time	Area 1 (many foxes)	Area 2 (few foxes)
Week 1	foxes eat most of the meat; small scraps are left	no animals eat the remains
Week 4	the small scraps are covered with fungi	the large remains are covered with fungi
Week 8	the scraps have broken down into the soil; moss next to that spot is greener than moss farther away	about half of the remains have broken down into the soil; moss next to the remains is greener than moss farther away

A student says, "The Arctic fox is a decomposer, because the remains broke down faster in the area with many foxes." Which statement BEST evaluates the student's claim and explains how the roles of the foxes and the decomposers affect the ecosystem?

A. The student is correct, because the remains broke down faster where foxes lived, so the foxes return materials to the soil.

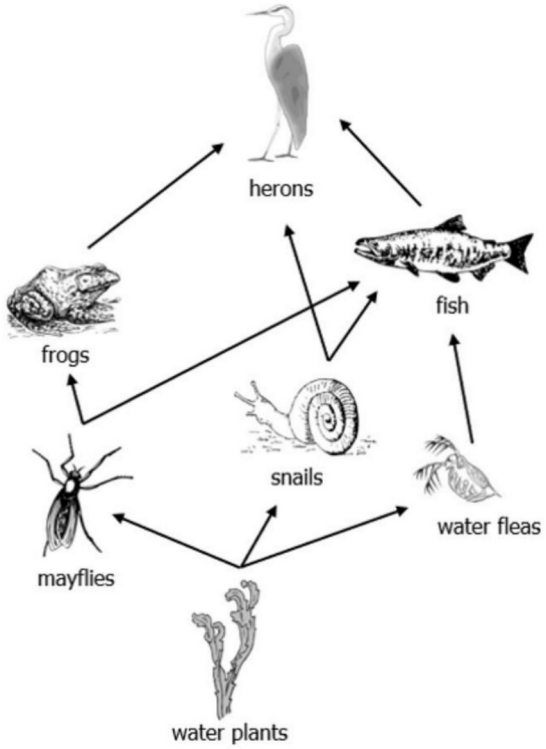
B. The student is correct, because the foxes and the fungi both fed on the remains, so they have the same role in the ecosystem.

C. The student is not correct, because the foxes slowed down the breakdown by taking food away from the fungi and bacteria.

D. The student is not correct: foxes are consumers that eat remains as scavengers, leaving smaller scraps, while fungi and bacteria break the scraps down and return materials to the soil in both areas.

GO ON

A food web of an aquatic ecosystem is shown.



9. Scientists added one new species to this ecosystem. They did not count every living thing. The table shows the numbers of four living things counted in the same area the year before and the year after the new species was added.

Pond Counts

Living Thing	Year Before	Year After
Water plants	500	360
Mayflies	200	340
Fish	60	70
Herons	12	11

Based on the food web and all of the data, which new species was MOST LIKELY added to the ecosystem?

A. a species that eats water plants

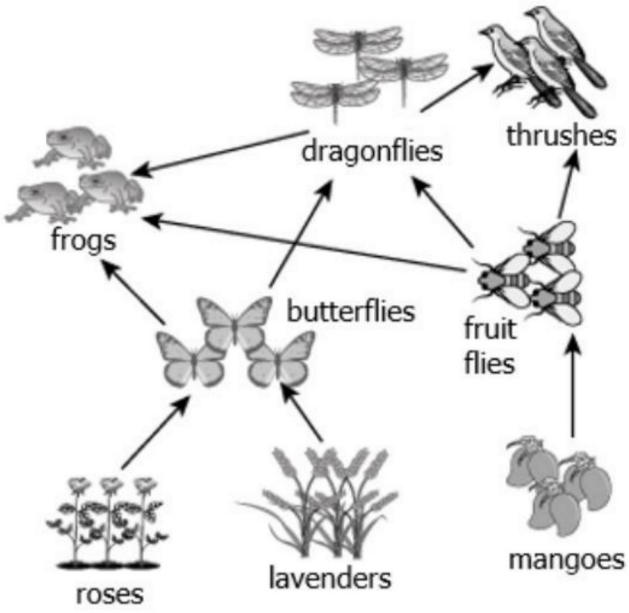
B. a species that eats herons

C. a species that eats frogs

D. a species that eats fish

GO ON

The food web shows an ecosystem.



10. Suppose all of the fruit flies were removed from this ecosystem. Which three changes would MOST LIKELY happen?

A. Fewer mangoes would be eaten, because fruit flies were the only animals in the food web that ate them.

B. Thrushes would increase, because they would no longer have to share fruit flies with frogs.

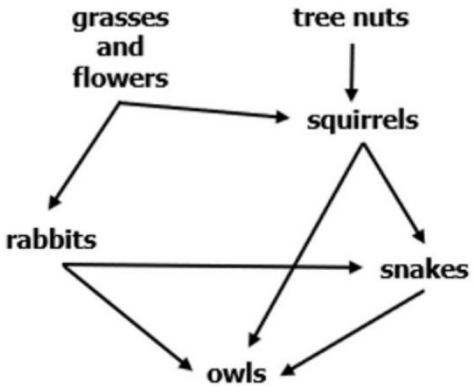
C. Dragonflies would decrease, because they would lose a food and thrushes and frogs would hunt them more.

D. Thrushes would have less food, because fruit flies were one of their two foods.

E. Roses and lavenders would decrease, because butterflies would have less to eat.

GO ON

Study the diagram of a food web.



11. A neighborhood made two changes. Early in Year 2, neighbors planted a large flower garden. Early in Year 3, a group trapped most of the snakes and moved them to a faraway park. The table shows what was counted in the neighborhood each year.

Neighborhood Counts

What Was Counted	Year 1	Year 2	Year 3
Patches of grasses and flowers	50	80	80
Rabbits	40	55	95
Squirrels	30	38	40
Snakes	20	19	4
Owls	6	6	8

Which explanation BEST accounts for the changes in the rabbit population over all three years?

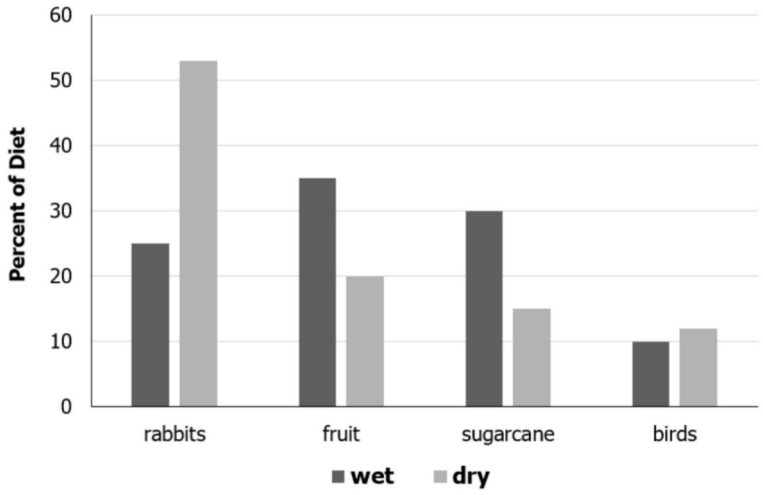
A. Rabbits increased only because the garden gave them more food; removing the snakes had no effect on the rabbits.

B. Rabbits increased only because most of the snakes were removed; the garden had no effect on the rabbits.

C. Rabbits increased because the number of owls increased, and owls protect rabbits by eating the snakes.

D. Rabbits increased some after the garden added food, then increased much more after the snakes were removed, because fewer rabbits were eaten.

The graph shows the diet of the maned wolf during wet and dry periods. Fruit and sugarcane are easy to find during wet periods but hard to find during dry periods.



12. In a nearby area, a disease kills most of the rabbits. Based on the data, during which period would maned wolves in that area MOST LIKELY have the hardest time meeting their need for food?

A. Dry periods, because rabbits are more than half of their diet then, and fruit and sugarcane are hard to find.

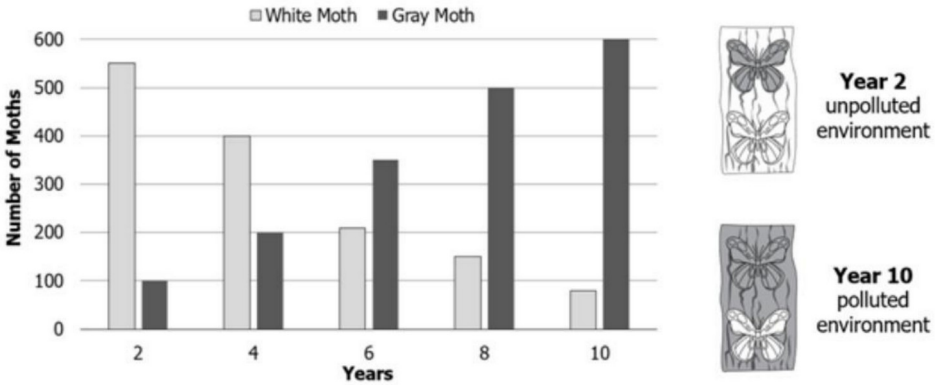
B. Wet periods, because rabbits are a large part of their diet then, and birds are hard to find.

C. Wet periods, because that is when they eat the most kinds of food, so losing one food matters most.

D. Neither period, because birds are about the same part of their diet in both periods, so they could eat birds instead.

GO ON

The graph shows the number of white-colored and gray-colored moths in one environment for 10 years. The diagram shows how an increase in pollution changes the environment during those 10 years. Birds eat moths that they can easily see. After Year 10, the town stops the pollution. Over the next several years, rain washes the tree bark light again.



13. Which prediction for the years after the pollution stops is BEST supported by the graph, the diagram, and the information about birds?

A. Gray moths will keep increasing, because a population that has grown will keep growing.

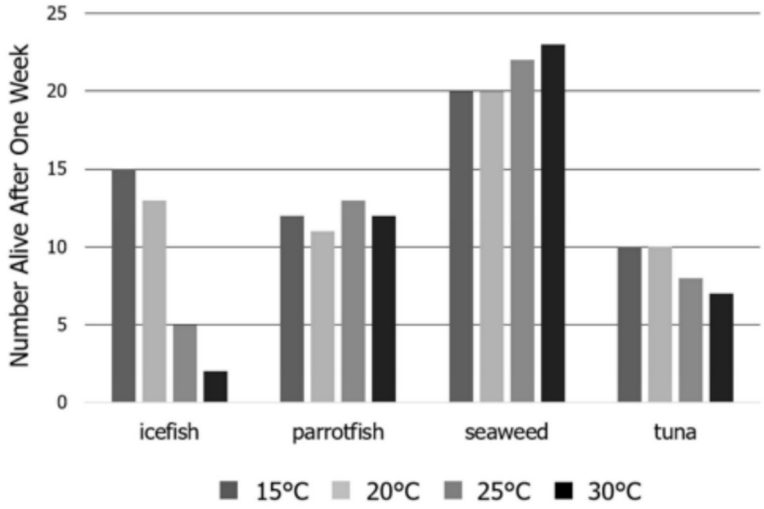
B. White moths will increase again, because birds will not see them easily on light bark, so more will survive to reproduce.

C. White moths will not come back, because a population that has become small can never grow again.

D. Both kinds of moths will decrease, because any change to an environment harms the living things there.

GO ON

A scientist is studying the effect of increasing ocean temperatures on plants and animals. The scientist observes the ability of different plants and animals to survive in ocean locations with different temperatures. The graph displays the information the scientist collects.



14. In one ocean area, the water is 15 degrees Celsius today. Scientists expect it to warm to 30 degrees Celsius. Seals in this area eat mostly icefish. Sea urchins in this area eat mostly seaweed.

Which two predictions about this ocean area are BEST supported by the data and the information above?

A. Parrotfish will disappear, because they cannot survive in water warmer than 20 degrees Celsius.

B. The seals may have to find other food or move away, because far fewer icefish will survive.

C. The tuna will become more common, so the seals can eat tuna instead of icefish.

D. The sea urchins may have more food, because slightly more seaweed will survive.

E. Every living thing in the area will be harmed the same amount by the warmer water.

15. **Barn swallows eat only flying insects. Robins eat earthworms and berries. Sparrows eat seeds. Flying insects near a farm eat the leaves of weeds that grow in the fields. After Year 1, the farmer begins spraying a pest killer that kills flying insects but does not harm earthworms, berries, or weeds. The table shows what scientists counted near the farm.**

Farm Survey

What Was Counted	Year 1 (before spraying)	Year 2	Year 3
Flying insects caught in traps	400	60	40
Barn swallow nests	12	3	0
Robin nests	8	8	9
Weed plants with seeds in a test area	20	45	70
Sparrows seen	0	6	15

Which explanation BEST accounts for all of the changes in the table?

A. The pest killer harmed all of the birds near the farm, so every bird population became smaller.

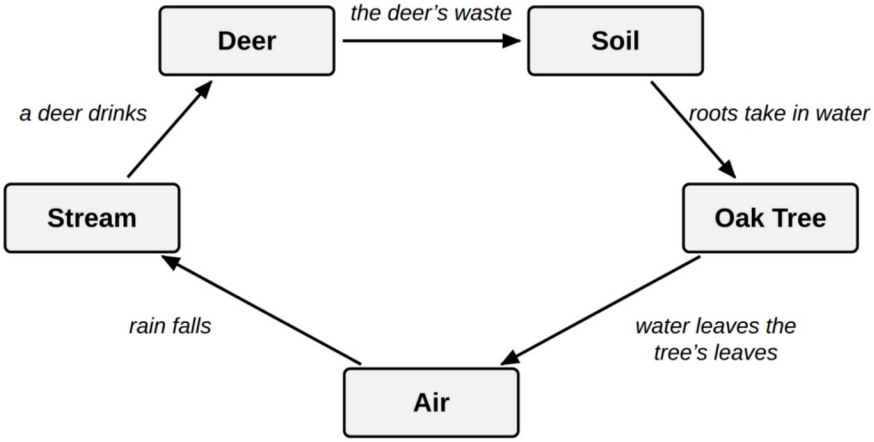
B. Sparrows moved in and chased the barn swallows away, even though the barn swallows still had plenty of food.

C. Barn swallows left because their food was gone, robins stayed because their food was not affected, and sparrows moved in as weeds with seeds increased.

D. Robins began eating the flying insects, so the barn swallows ran out of food and left the farm.

GO ON

16. The model shows how water moves through part of a forest.



A student claims that once water becomes part of a living thing, it can never be used by another living thing. Which three statements BEST show that the student's claim is wrong?

A. Water the deer drinks leaves in its waste and is later taken in by the oak tree's roots.

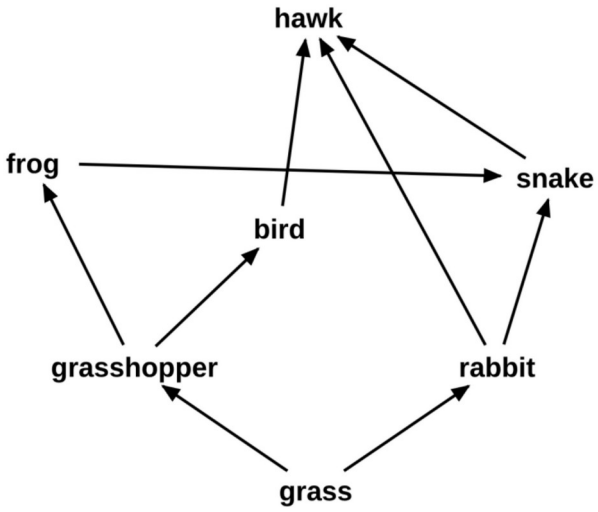
B. Water in the stream is not part of any living thing.

C. Water that leaves the oak tree's leaves can fall as rain into the stream where the deer drinks.

D. The oak tree gets water only from rain that lands directly on its leaves.

E. The same water can move between living and nonliving parts of the forest many times.

17. The food web shows the flow of matter in a grassland.



Suppose all of the frogs disappeared from this grassland. Which statement BEST describes how matter from the grass could still reach the snake and the hawk?

A. Matter could reach the snake only through rabbits, and it could reach the hawk through rabbits, through snakes, and through grasshoppers and birds.

B. Matter could no longer reach the snake, because frogs were the snake's only link to the grass.

C. Matter could reach the snake through grasshoppers and birds, because the snake would eat birds instead of frogs.

D. Matter could reach the hawk only through the snake, because the hawk is at the top of the food web.

18. Students in Memphis observe the oak trees and squirrels in their schoolyard for one year. They record these observations.

- **Fall: Squirrels eat some acorns from the oak trees and bury other acorns in the ground.**
- **Winter: Squirrels dig up and eat many of the buried acorns.**
- **Spring: Small oak seedlings grow in spots where squirrels buried acorns and did not dig them up.**
- **All year: Very few oak seedlings grow under the trees, where fallen acorns stay on top of the mowed grass.**

A student says, "Squirrels only harm oak trees, because squirrels eat the acorns." Which statement BEST uses all of the observations to evaluate the student's claim?

A. The student is correct, because squirrels eat many of the acorns, so fewer acorns are left to grow into trees.

B. The student is correct, because the seedlings grew from acorns that fell from the trees without any help from squirrels.

C. The student is not correct, because squirrels use sunlight to make food and share that food with the oak trees.

D. The student is not correct, because oak trees feed squirrels, and buried acorns that squirrels do not eat can grow into new oak trees.

GO ON

19. In a forest, owls eat mice, rabbits, and squirrels. Foxes eat mice and rabbits. Mice, rabbits, and squirrels eat plants. In Year 1, a disease begins to spread among the squirrels. The table shows the number of each animal counted in the forest.

Forest Animal Counts

Animal	Year 1	Year 2	Year 3
Squirrels	60	12	10
Mice	80	66	54
Rabbits	50	42	36
Owls	12	12	12
Foxes	10	9	7

Which explanation BEST accounts for all of the changes in the table?

A. The disease spread to every animal in the forest, so all of the animal populations became smaller.

B. The owls met their need for food by eating more mice and rabbits, so fewer mice and rabbits were left for the foxes.

C. The owls make some of their own food, so losing the squirrels did not change anything else in the forest.

D. The owls moved to a different forest, and the foxes began eating the few squirrels that were left.

GO ON

20. A pond slowly dried up over three summers. The table shows the water depth and the number of animals counted at the pond each summer.

Pond Survey

What Was Measured	Summer 1	Summer 2	Summer 3
Water depth	1 meter	30 centimeters	0 (dry, muddy ground)
Frogs	40	12	0
Ducks	25	8	0
Grasshoppers	10	30	55
Field mice	0	6	20

Which statement BEST explains the changes shown in the data?

A. As the pond dried, all of the animals were harmed, so every population became smaller.

B. The frogs and ducks ate all of the grasshoppers and field mice, so the frogs and ducks ran out of food.

C. As the pond dried, frogs and ducks could no longer meet their needs there, and grasshoppers and field mice moved in.

D. The grasshoppers and field mice used up the pond's water, and that made the pond dry up.

GO ON

21. A student finds two objects in the same rock and records these observations.

- **Object 1: It is shaped like a tooth, with a pointed top and a long root. The top has a smooth, shiny outer layer, and the root is rougher, like the parts of a real tooth. Its root fits exactly into an empty hole in a fossil jawbone found nearby.**
- **Object 2: It is pointed at one end, but it has no root and no shiny outer layer. Its surface is the same rough stone all over. It does not fit any hole in the jawbone.**
- **Both objects are as hard and heavy as stone.**

The student says, "Both objects are just rocks that happen to be pointed." Which statement BEST uses the observations to evaluate the student's claim?

A. The evidence supports the claim for Object 2 but not Object 1, because Object 1's root, outer layer, and fit in the jawbone show it formed from a real tooth.

B. The claim is wrong for both objects, because both are pointed and both were found in the same rock as the jawbone.

C. The claim is correct for both objects, because both are as hard and heavy as stone.

D. The claim is wrong for both objects, because Object 1 is an unchanged real tooth and Object 2 is a tooth that lost its root.

GO ON

22. Scientists study rock that formed at the bottom of an ocean long ago. The table shows the fossils they found. Today, soft-bodied animals such as worms and jellyfish are common in oceans.

Fossils Found in Ocean Rock

Kind of Fossil	Body Type	Number Found
Clam shells and snail shells	hard shells	350
Fish skeletons	hard bones	40
Print of a jellyfish	soft body, no hard parts	1
Worm bodies	soft body, no hard parts	0
Worm burrows (tunnels left in the rock)	trace of a soft-bodied animal	120

Which three conclusions are BEST supported by the evidence?

A. Living things with hard parts, such as shells and bones, are more likely to become fossils than soft-bodied living things.

B. The fossils do not show every kind of living thing that lived there, because some left no body fossils.

C. Worms did not live there long ago, because no fossil worm bodies were found in the rock.

D. Traces, such as burrows, can show that a living thing was present even when its body was not preserved.

E. Clams and snails were the only animals that lived there, because their fossils are the most common.

GO ON

23. Scientists found fossils of an animal they named Animal X in rock that formed long ago. No living Animal X has ever been found. The table compares the features of Animal X with the features of two kinds of animals living today.

Comparing Features

Feature	Animal X (fossils)	Birds Living Today	Lizards Living Today
Feathers	yes	yes	no
Wings	yes	yes	no
Teeth	yes	no	yes
Long, bony tail	yes	no	yes

Scientist 1 says, "Animal X is a kind of bird that is still alive today." Scientist 2 says, "Animal X was a kind of lizard." Which statement BEST evaluates both claims using all of the evidence?

A. Scientist 1 is correct, because Animal X had feathers and wings, just like the birds living today.

B. Scientist 2 is correct, because Animal X had teeth and a long, bony tail, just like the lizards living today.

C. Both scientists are partly correct, so Animal X is a kind of bird and a kind of lizard that is still alive today.

D. Neither claim is completely correct: no living Animal X has been found, and its complete set of features matches neither living group, so it was an extinct animal that shared features with both.

GO ON

24. Scientists find these fossils together in the same rock.

- **A turtle shell with a row of round holes in it.**
- **A crocodile jaw with teeth that have the same size and spacing as the holes in the turtle shell.**
- **Fossils of water plants.**
- **Ripple marks like the ones moving water makes on a sandy bottom.**

Which two conclusions are BEST supported by all of the evidence?

A. Turtles hunted and ate crocodiles in this place.

B. Moving water wore the holes into the turtle shell after it was buried.

C. A crocodile most likely bit the turtle.

D. The fossils show exactly how many turtles the crocodiles ate each year.

E. The place where the fossils were found was once underwater.

GO ON

25. The table shows the fossils found at three places and what each place is like today.

Fossils at Three Places

Place	Fossils Found	What the Place Is Like Today
Place 1	coral, clam shells, shark teeth	a dry hillside far from any ocean
Place 2	fern leaves, insects, tree trunks	a grassy field
Place 3	palm tree leaves, crocodile teeth	a cold, dry mountainside

Today, coral lives only in oceans. Palm trees grow only where it stays warm, and crocodiles live only in warm places with water.

A student claims, "Rivers carried these fossils to these places, so the fossils do not tell us what the places were like long ago." Which two statements BEST use the evidence to argue against the student's claim?

A. Place 2 has fern and insect fossils, which shows that Place 2 was once covered by ocean.

B. Place 1 has fossils of several kinds of ocean life together, which shows that an ocean community once lived there.

C. All three places have fossils, which shows that fossils can be found almost anywhere on Earth.

D. Place 3 is cold and dry today, which shows that fossils always match what a place is like today.

E. Place 3 has fossils of both a plant and an animal that need warm places, which shows that Place 3 was once much warmer than it is today.

Students design boxes to protect a model fossil when the box is dropped from a height of 1 meter.

<u>Criteria:</u> The model fossil must not crack during any of three drops. The box must open and close again without tearing.

<u>Constraints:</u> The box must have a mass of no more than 200 grams. The box may be made only of paper, tape, and cotton.

Test Results

Design	Materials Used	Mass of Box	Result After Three Drops	Opens and Closes Without Tearing?
Design 1	paper, tape, cotton	180 grams	cracked on the second drop	yes
Design 2	paper, tape, cotton	250 grams	no cracks	yes
Design 3	paper, tape, cotton, bubble wrap	170 grams	no cracks	yes
Design 4	paper, tape, cotton	190 grams	no cracks	no, tore on the second opening
Design 5	paper, tape, cotton	195 grams	no cracks	yes

This question has two parts. Question 26 is Part A, and Question 27 is Part B.

26. <u>PART A</u>. Which design meets all of the criteria and all of the constraints?

A. Design 2

B. Design 3

C. Design 4

D. Design 5

GO ON

27. **<u>PART B</u>. Which statement BEST explains why the design in Part A is the only design that meets all of the criteria and constraints?**

A. Design 2 protects the fossil but is too heavy, Design 3 uses a material that is not allowed, and Design 4 tears when it is opened.

B. Design 2 protects the fossil best because it is the heaviest, so a heavier box is always the most effective design.

C. Design 3 is lighter than the other boxes that did not crack, so being light matters more than which materials are used.

D. Design 4 tearing when opened is only a small problem, because a box that protects the fossil meets every requirement.



You have reached the end of this test.