

Student Name: _____ Date: _____

The article "Nature's Engineer" is for questions 1–5 and 10–11.

Nature's Engineer

This article describes beavers in Gates of the Arctic National Park and Preserve in Alaska.

Dams

(1) Very few animals have the beaver's ability to reshape the world in which they live. A beaver's survival depends on having water deep enough so it doesn't freeze to the bottom in winter. They also need water to get around, to find food, and to stay safe from predators.

(2) This is why beavers build dams across shallow creeks and rivers. These dams are made of branches stuck down into the stream bed and then built up with a thick mortar of mud, gravel and interwoven branches. The dam is constantly maintained to keep the water at the same level for beaver comfort and security.

(3) Beaver dams are sometimes maintained and expanded over many generations. They can be up to 1,000 feet long and 15-20 feet high. As the pond grows, it floods more surrounding land and extends the beaver's feeding area. This is important because over the years, beavers use up food along the pond's edges so they must travel farther to find trees and shrubs. Beavers also dig canals a few feet wide and up to several hundred yards long, to reach food and float it to the pond.

Lodges

(4) The other feat of engineering is the beaver lodge, which is constructed by first building a platform of sticks, mud, and rocks, then piling on more sticks and mud until it forms a large dome. Finally the animals gnaw into the dome to hollow out the inside like an igloo with the floor above water level. Typically, the lodge is about 15 feet in diameter and about 6 feet high.

(5) Beavers will use their lodge all year round. Because they are so well constructed, a lodge can last for many years, even well after the builders have abandoned it.

(6) There are usually two underwater tunnels into the lodge, sloping up into a feeding room and a separate living or nesting room. There is always an airway up through the top of the lodge. In the winter, steam from the beavers' warm bodies and breath may be seen rising out from the airway.

(7) Beavers living in deeper rivers and lakes often have no lodge but live in dens dug into the bank.

(8) When freezing weather comes, the plaster mud on the outside of the lodge gets hard like concrete so it is almost impenetrable for predators, even bears. If a beaver is confronted by a predator such as a river otter which has entered the tunnel, it can put up a good fight, especially when protecting its young.

(9) In the fall, to prepare for winter, beavers stash large piles of fresh branches in the water close to their lodge. These are clearly visible as a cluster of sticks protruding above the water or frozen into the ice.

(10) The expression, "busy as a beaver," is based on real life. Koyukon people, who have studied these animals for generations, say that beavers get skinny in the fall from working so hard to prepare for the cold months ahead. But unlike many other animals, beavers live well in the winter and actually put on fat. It's interesting to imagine beavers in the perpetual darkness beneath snow-covered ice and within the lodge, swimming out at intervals to get branches and bringing them inside to eat.

Adapted from "Nature's Engineer," National Park Service, December 17, 2020. Public domain.

1. A reader thinks, "The tunnels into the lodge are underwater, so the beavers must rest underwater, too." Which rereading plan would help the reader find and connect the details needed to check this idea?

A. Reread paragraph 4 and mark the measurements of the lodge, comparing its width with its height.

B. Reread paragraphs 4 and 6 and mark the floor's location, connecting it with the way the tunnels slope.

C. Reread paragraph 6 and mark the names of the rooms, comparing what beavers use each room for.

D. Reread paragraphs 6 and 7 and mark the types of homes, comparing a lodge with a riverbank den.

2. Which sentence in paragraph 10 best supports the inference that beavers' fall preparations allow them to get winter meals without traveling across land?

Underline ONE labeled sentence in the paragraph.

Nature's Engineer, paragraph 10

[A] The expression, "busy as a beaver," is based on real life. [B] Koyukon people, who have studied these animals for generations, say that beavers get skinny in the fall from working so hard to prepare for the cold months ahead. [C] But unlike many other animals, beavers live well in the winter and actually put on fat. [D] It's interesting to imagine beavers in the perpetual darkness beneath snow-covered ice and within the lodge, swimming out at intervals to get branches and bringing them inside to eat.

- 3.** Which statement expresses a key idea supported by the details in paragraph 3?
- A.** Beavers need larger dams because flooded land leaves fewer trees and shrubs to eat.
 - B.** Beavers can stop enlarging their ponds once they dig canals to transport their food.
 - C.** Beavers need dams of a certain size before they can build canals for food.
 - D.** Beavers can keep finding food by increasing the area they can reach by water.

- 4.** How are the building actions organized in the first two sentences of paragraph 4?
- A.** The actions build on one another: make a platform, form a dome, and hollow out that dome.
 - B.** The actions are grouped by material: finish using sticks, finish using mud, and finish using rocks.
 - C.** The actions decrease in importance: make the main platform, add the dome, and hollow out the dome.
 - D.** The actions offer separate building methods: make a platform, pile up a dome, or hollow out a dome.

- 5.** Which experience connects to the idea in paragraph 5 about a lodge after its builders leave?
- A.** Students display a model throughout the school year, then take it apart when they leave the classroom for the summer.
 - B.** Students leave a model behind when they change classrooms, but its loosely joined pieces fall apart soon after they go.
 - C.** Students fasten a model's pieces securely, and it stays together for years after they have moved on to another school.
 - D.** Students keep a model together for years by returning to their old classroom each week to replace pieces that fall off.

The article "Reintroducing Beavers to Bandelier" is for questions 6–12.

Reintroducing Beavers to Bandelier

This 2023 article reports on work in Frijoles Canyon at Bandelier National Monument in New Mexico.

(1) The Las Conchas Fire of 2011 caused severe damage to the Jemez Mountains of north-central New Mexico. It burned a total of 156,000 acres (243 square miles), across land 6,500 to 10,000 feet above sea level. In large parts of the burned area, the fire's heat killed nearly all the trees. This damaged the way plants regrew and water moved through the landscape.

(2) In Frijoles Canyon at Bandelier National Monument, the loss of trees, sudden flooding, and buildup of soil changed life in the creek and along its banks. Mature trees along Frijoles Creek were uprooted and carried downstream by thick, muddy floodwaters. Large tangled piles of logs formed throughout the canyon, and soil filled the creekbed. Restoring the ecosystem became crucial.

(3) Along with planting trees beside the creek, the National Park Service partnered with the New Mexico Department of Game and Fish (NMDGF) to bring beavers back to Frijoles Canyon.

(4) Beavers are ecosystem engineers. They raise the level of water stored in the ground, control stream flow, improve water quality, and increase the variety of living things. The dams they build hold back water to create ponds, and those ponds become habitat for birds, fish, and native plants. These benefits would prove valuable as Frijoles Canyon recovered from the fire.

(5) Since 2019, a total of 27 beavers have been reintroduced. These animals were trapped on private lands and transported by NMDGF to Bandelier National Monument. Park staff, interns, and volunteers then hiked the caged beavers to carefully chosen release locations within the canyon.

(6) Between bringing back beavers and replanting trees, conditions for life in the canyon's burned and flooded areas have improved. The beaver ponds have provided good places for bringing back Rio Grande chub, Rio Grande sucker, and Rio Grande cutthroat trout. The ponds have also created habitat for the endangered New Mexico meadow jumping mouse and native leopard frogs. Replanted Douglas fir and ponderosa pine trees have started to take hold and help keep soil from washing away. Park scientists and research partners continue to watch the recovery of this landscape after the fire.

Adapted from "Reintroducing Beavers to Bandelier," National Park Service, July 19, 2023. Public domain.

6. Which explanation correctly identifies what the prefix *trans-* contributes to the meaning of *transported* in paragraph 5?

- A.** It shows that carrying is the action being described.
- B.** It shows that the movement goes from one place to another.
- C.** It shows that the action took place in the past.
- D.** It shows that someone else performed the action on the animals.

7. After reading paragraphs 1 and 2, a student says, "The trees burned, so the log piles must be where the trees had grown." Which question would help the student find the event missing from this explanation?

- A.** What happened to the trees before the log piles formed?
- B.** How large was the area where the fire damaged the trees?
- C.** How did the loss of trees affect plants growing back?
- D.** What material filled the creekbed after the trees were lost?

- 8.** Which statement gives the central idea of the article and evidence that supports it?
- A.** Returning beavers to the canyon requires careful planning, as workers carry caged beavers to specially selected release sites.
 - B.** Restoration work has mainly benefited fish in the canyon, as new beaver ponds provide places to return three native species.
 - C.** Returning beavers has completed the canyon's recovery, as new beaver ponds provide homes for endangered mice and native frogs.
 - D.** Replanting trees and returning beavers are helping the canyon recover, as beaver ponds now support several kinds of wildlife.

- 9.** Why does the author describe the damage in paragraph 2 before introducing beavers and their abilities in paragraphs 3 and 4?
- A.** It helps readers compare planting trees with returning beavers and decide which effort would provide greater benefits for the canyon.
 - B.** It helps readers compare the creek's earlier damage with the beavers' benefits and trace the order in which those benefits would appear.
 - C.** It helps readers connect the beavers' abilities to the canyon's needs and understand why beavers were chosen for the restoration work.
 - D.** It helps readers compare the creek's earlier damage with the beavers' benefits and rank the damage from most harmful to least harmful.

10. A town is planning projects near a river. Which proposed choices connect the town's plans to ideas supported by the articles?

Select **TWO** correct answers.

- ☐ **A.** Before building a riverside trail, survey the riverbanks for beaver homes even where no lodges are visible.
- ☐ **B.** For a local wildlife project, invite volunteers and student interns to help park staff complete outdoor work.
- ☐ **C.** To prepare a lakeside area for beavers, fill existing bank dens so the animals will build homes there.
- ☐ **D.** For a wildlife relocation, put volunteers in charge of selecting release sites because they have helped carry animals.
- ☐ **E.** When mapping beaver homes for a community nature walk, mark lodges as active homes and bank dens as abandoned homes.

- 11.** What new understanding about the ponds in Frijoles Canyon is supported by information from both articles?
- A.** Dams that need no further care can help beavers preserve pond habitats for a variety of living things.
 - B.** Continued care of their dams can help beavers preserve pond habitats for a variety of living things.
 - C.** Continued care of their dams can help beavers preserve pond habitats that benefit the beavers alone.
 - D.** Dams that need no further care can help beavers preserve pond habitats that benefit the beavers alone.

12. Based on paragraph 6, explain why park scientists and research partners continue to watch the canyon's recovery after the beavers have returned.

Use evidence from the article to support your answer.

The draft about monarch butterflies is for questions 13–16.

Observing Life Stages

This draft about monarch butterflies in Cuyahoga Valley is being revised.

(1) When female monarchs start arriving in the Cuyahoga Valley in late June, they typically lay one cream-colored egg per plant, no larger than a pinhead, on the underside of milkweed leaves. (2) A magnifier helps observers see details on the eggs.

(3) After three to six days, a tiny caterpillar, or larva, emerges and starts eating the milkweed, internalizing toxic chemicals from the plant. (4) To warn predators, the young monarch soon turns a distinctive pattern of bright yellow, white, and black. (5) The caterpillar feeds day and night and grows rapidly. (6) [Blank 1], it must shed its skin, or molt, every three days.

(7) The stages between larval molts are called instars. (8) A monarch goes through five larval instars. (9) With each shed, it adds more color bands along its body, becoming nearly two inches long in two weeks.

(10) At this point, the caterpillar is striking and conspicuous.

(11) The caterpillar stops feeding and starts searching for a sturdy place on its host or a nearby plant.

(12) There, the caterpillar weaves a silk button. (13) The caterpillar attaches itself to the silk button and hangs upside down like the letter J. (14) After about a day, it sheds its skin for the last time and forms the pupa, a magnificent greenish chrysalis with gold spots. (15) After nearly two weeks, the chrysalis becomes transparent; inside you can see the butterfly that will emerge in a day or two.

Adapted for revision practice from "Observing Life Stages" in Monarchs on the Move in Cuyahoga Valley, National Park Service. Public domain.

13. Which sentence should be added before sentence 1 to introduce the focus of the entire draft?

- A.** In Cuyahoga Valley, plants provide monarchs with food, places to lay eggs, and sturdy places to form a chrysalis.
- B.** Monarch caterpillars develop bright colors and many bands that make their bodies noticeable as they eat and grow.
- C.** Before becoming a chrysalis, a monarch caterpillar searches for a sturdy place, hangs upside down, and sheds its skin.
- D.** A monarch develops from a tiny egg into a butterfly by passing through several forms in a particular order.

14. Which transition best connects the ideas in sentences 5 and 6?

Circle the word or phrase that belongs in Blank 1.

(5) The caterpillar feeds day and night and grows rapidly. (6) _____ (Blank 1), it must shed its skin, or molt, every three days.

Blank 1: **A.** In contrast **B.** For example **C.** As a result

15. Which sentence should be added immediately after sentence 2 to develop its idea with a new, specific detail?

- A.** The eggs have an oval shape with parallel ridges on their surface.
- B.** The eggs have a cream color and are no larger than a pinhead.
- C.** The eggs are usually found one per plant on the undersides of milkweed leaves.
- D.** Arriving in late June, female monarchs typically lay just one egg on each plant.

16. Which sentence combines sentences 12 and 13 clearly and keeps all their important ideas?

- A.** There, the caterpillar weaves a silk button shaped like the letter J, attaches itself to the button, and hangs upside down.
- B.** There, the caterpillar weaves a silk button and hangs upside down beside it, with its body shaped like the letter J.
- C.** There, the caterpillar weaves a silk button, attaches itself to it, and hangs upside down like the letter J.
- D.** There, the caterpillar attaches itself to the silk button, which supports it as it hangs upside down like the letter J.