

# Changing Traits

How population differences matter when conditions shift

**6.13.C** “describe how variations within a population can be an advantage or disadvantage to the survival of a population as environments change.”

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## 1 READ AND MARK \_\_\_\_\_ Read it twice

**YOUR JOB** Underline each variation in the lizard population, circle each environmental change, and write A or D beside each stated survival effect, using A for advantage and D for disadvantage. A sentence or phrase may need both letters if it describes both effects.

### Lizards on a Changing Island

- ① On a coastal island, a population of lizards has natural variation. Some lizards have pale scales, while others have dark scales. Most lizards also differ slightly in how quickly they can run across loose sand. For many years, dark lava rock covers most of the ground. Hawks hunt by sight, so dark-scaled lizards are harder to notice on the rocks. They are more likely to survive long enough to reproduce. Pale-scaled lizards are easier for hawks to spot in this environment.
- ② Later, a volcanic eruption spreads light ash across much of the island. The ground becomes pale instead of dark. Now pale-scaled lizards blend in better, and hawks may miss them more often. Their scale color becomes an advantage in the changed environment. Dark-scaled lizards stand out against the ash, so their color becomes a disadvantage. If enough pale-scaled lizards survive and reproduce, more young lizards in later generations may have pale scales. The population can continue because some members fit the new conditions.
- ③ Other variations can matter when conditions shift again. After several dry years, plants grow farther apart, and lizards must cross open sand to find food and shelter. Lizards that run quickly may escape hawks and reach scattered plants more often. Slow runners may have less success, so speed can affect survival during drought. A trait is not permanently helpful or harmful. Its effect depends on the environment. Having different traits in one population increases the chance that at least some members will survive future changes.

**2 ANSWER WITH EVIDENCE** \_\_\_\_\_ Use the passage

**1** Why were dark scales an advantage before the eruption? Include the environmental condition in your answer.

---

---

**2** How did the ash change dark scales from an advantage to a disadvantage?

---

---

**3** Explain how pale-scaled lizards could help the population survive after the eruption.

---

---

---

**4** During the dry years, which running-speed variation was an advantage, and why?

---

---

**3 YOUR TURN** \_\_\_\_\_ Your own words

Invent a population other than lizards with two versions of one trait. In exactly three sentences, describe an environmental change, explain which version becomes an advantage and which becomes a disadvantage, and tell how the advantage could help the population survive.

---

---

---

---

---

---

---

**PART 1 • READ AND MARK**

Underline each variation in the lizard population, circle each environmental change, and write A or D beside each stated survival effect, using A for advantage and D for disadvantage. A sentence or phrase may need both letters if it describes both effects. Accept any marking that follows this job and points at the right text.

**PART 2 • ANSWERS**

| # | QUESTION                                                                                                   | ANSWER                                                                                                                                             |
|---|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Why were dark scales an advantage before the eruption? Include the environmental condition in your answer. | <b>Dark scales helped lizards blend in with the dark lava rock, making them harder for hawks to see.</b>                                           |
| 2 | How did the ash change dark scales from an advantage to a disadvantage?                                    | <b>The light ash made dark-scaled lizards stand out, so hawks could spot them more easily.</b>                                                     |
| 3 | Explain how pale-scaled lizards could help the population survive after the eruption.                      | <b>Pale-scaled lizards were harder to see on the ash. More may survive and reproduce, so later generations may include more pale-scaled young.</b> |
| 4 | During the dry years, which running-speed variation was an advantage, and why?                             | <b>Running quickly was an advantage because fast lizards could escape hawks and reach scattered plants more often.</b>                             |

**PART 3 • YOUR TURN (SAMPLE ANSWER)**

A population of rabbits includes rabbits with thick fur and rabbits with thin fur. When winters become colder, thick fur helps rabbits stay warm, while thin fur can make survival harder. If thick-furred rabbits survive and reproduce more, the population is more likely to continue through cold winters.

Accept equivalent explanations that connect a trait variation, an environmental change, and a survival or reproduction effect. For the open response, accept any biologically reasonable population and trait relationship that includes both an advantage and a disadvantage.