

# Water Paths, Human Choices

Analyze how people affect water above and below ground.

**7.11.A** “analyze the beneficial and harmful influences of human activity on groundwater and surface water in a watershed; and”

NAME \_\_\_\_\_

DATE \_\_\_\_\_

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

**YOUR JOB** Underline each human action, then write B or H beside it to show whether it benefits or harms groundwater or surface water.

### One Watershed, Connected Water

- ① Oak Run watershed includes hills, a creek, storm drains, and an aquifer beneath the soil. Rainwater can soak through open ground and recharge the aquifer, which supplies wells. It can also flow over pavement into the creek. When builders replace a meadow with parking lots, less water infiltrates. Fast runoff may carry oil, fertilizer, and litter into surface water. Less recharge can lower groundwater available to wells during dry months when demand is high locally.
- ② People can reduce these effects by protecting land around streams and wells. Native grasses, trees, and wetland plants slow runoff, trap some sediment, and let more water enter the ground. Farmers can test soil before applying fertilizer and use only the amount crops need. A neighborhood can collect roof runoff in rain gardens rather than sending it quickly to a drain. These choices improve water quality and help replenish groundwater in the local aquifer below.
- ③ Not every action has only one result. A treatment plant that removes pollutants from wastewater before releasing it to a river benefits surface water. However, leaking sewer pipes or poorly maintained septic systems can allow germs and nutrients to seep into groundwater. Too many nutrients reaching a pond can cause heavy algal growth. As algae die and decompose, oxygen in the water may decrease, harming fish. In a watershed, water moving on the surface and underground connects these impacts.

2

ANSWER WITH EVIDENCE

Use the passage

1

How do parking lots affect both groundwater recharge and the creek?

2

How do native plants help protect water in the watershed?

3

Compare the treatment plant with leaking sewer pipes or poorly maintained septic systems. How does each affect water?

4

Explain how too many nutrients can eventually harm fish in a pond.

3

YOUR TURN

Your own words

Complete the table with one beneficial human action and one harmful human action that are different from the passage. Predict one effect each action could have on surface water and groundwater.

| HUMAN ACTION | EFFECT ON SURFACE WATER | EFFECT ON GROUNDWATER |
|--------------|-------------------------|-----------------------|
|              |                         |                       |
|              |                         |                       |

**PART 1 • READ AND MARK**

Underline each human action, then write B or H beside it to show whether it benefits or harms groundwater or surface water. Accept any marking that follows this job and points at the right text.

**PART 2 • ANSWERS**

| # | QUESTION                                                                                                              | ANSWER                                                                                                                                                                                                         |
|---|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | How do parking lots affect both groundwater recharge and the creek?                                                   | <b>Parking lots reduce infiltration and groundwater recharge. They increase fast runoff that can carry pollutants into the creek.</b>                                                                          |
| 2 | How do native plants help protect water in the watershed?                                                             | <b>They slow runoff, trap some sediment, and allow more water to enter the ground and recharge groundwater.</b>                                                                                                |
| 3 | Compare the treatment plant with leaking sewer pipes or poorly maintained septic systems. How does each affect water? | <b>A treatment plant benefits surface water by removing pollutants before wastewater enters a river. Leaking pipes or septic systems can harm groundwater by allowing germs and nutrients to seep into it.</b> |
| 4 | Explain how too many nutrients can eventually harm fish in a pond.                                                    | <b>Extra nutrients can cause heavy algal growth. When algae die and decompose, oxygen decreases in the water, which can harm fish.</b>                                                                         |

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

| HUMAN ACTION                                            | EFFECT ON SURFACE WATER                                       | EFFECT ON GROUNDWATER                                  |
|---------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------|
| Install permeable pavement in a clean school courtyard. | Slows runoff and reduces water flowing quickly into a stream. | Lets more rain infiltrate and recharge the aquifer.    |
| Dump motor oil on a driveway.                           | Runoff can carry oil into a creek.                            | Oil can seep through soil and contaminate groundwater. |

Accept reasonable human actions and predictions that correctly connect runoff or infiltration to surface water and groundwater. Students may use different examples than the sample if both predicted effects are scientifically plausible.