Creek Under Pressure

Trace runoff from a growing neighborhood and evaluate a solution.

6.11 "Obtain, evaluate, and communicate information concerning the relationships between human activities and natural processes and how those relationships affect Earth's systems..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two human activities that affect Pine Creek, circle two effects on the creek, and box one way students could test whether a solution helps.

What Happens When Rain Hits Pavement?

1. Ten years ago, the area around Pine Creek had fields and a few houses. As more families moved in, builders added homes, parking lots, and roads. Rain once soaked into much of the ground. Now rain runs quickly across pavement and enters storm drains that empty into the creek. Fast-moving runoff can carry soil from construction sites into the water. Cloudy water blocks sunlight from underwater plants, and settled soil can cover the gravel where some fish lay eggs.

2. Students want to find out whether runoff from the growing neighborhood is changing the creek. They could record rainfall and measure water cloudiness at two spots, one above the storm drain and one below it. They would sample both spots before and after several storms, not just once. A cloudy sample below the drain would be a clue, but it would not prove that the drain caused the change. Other sources, such as a muddy trail, may also add soil.

3. One possible solution is to plant rain gardens beside parking lots. These shallow planted areas catch some runoff and let it soak into the soil. They can trap some sediment before it reaches the creek, but a garden may overflow during a very heavy storm. Students could compare cloudiness at the same two creek spots over many storms before and after the gardens are built, while recording rainfall. Over time, growing populations that add pavement in many places can put pressure on freshwater ecosystems around the world.

2 ANSWER WITH EVIDENCE

Use the passage

1. How can adding parking lots and roads make it harder for underwater plants in Pine Creek to get sunlight?

2. Why should students measure cloudiness both above and below the storm drain before and after several storms?

3. Why would one cloudy sample below the storm drain not prove that the drain caused the cloudiness?

4. How could rain gardens reduce the problem, and when might they not work as well?

3 YOUR TURN

Your own words

A school has more students this year. On windy days, food wrappers blow from its crowded playground into a nearby pond. In four to five sentences, define the environmental problem, describe how you would monitor it, propose a solution, and explain how you would check whether your solution works.

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PART 1 · READ AND MARK

Underline two human activities that affect Pine Creek, circle two effects on the creek, and box one way students could test whether a solution helps. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How can adding parking lots and roads make it harder for underwater plants in Pine Creek to get sunlight?	**Pavement sends rainwater toward the creek instead of letting it soak into the ground. The runoff can carry soil into the creek, making the water cloudy and blocking sunlight.**
2	Why should students measure cloudiness both above and below the storm drain before and after several storms?	**The measurements let students compare the two spots and look for a repeated change after storms, rather than relying on one sample.**
3	Why would one cloudy sample below the storm drain not prove that the drain caused the cloudiness?	**Soil could come from another source, such as a muddy trail. One sample cannot show whether the change happens repeatedly after storms.**
4	How could rain gardens reduce the problem, and when might they not work as well?	**Rain gardens let some runoff soak into the soil and trap some sediment. They may overflow during a very heavy storm.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Wrappers from the growing school can enter the pond and harm animals that mistake them for food. I would count wrappers along the same stretch of pond shore after windy school days and remove them after each count. I would place covered trash bins beside the playground and ask students to use them. I would compare counts from windy days before and after the bins are installed to see whether fewer wrappers reach the pond.

Accept other accurate cause-and-effect chains supported by the passage. For the open task, accept a practical way to monitor wrappers, a solution that could reduce litter, and a fair comparison to check its effect.