

Creek Comeback Plan

Read evidence to design, test, and improve a biodiversity solution.

HS-LS2-7 “Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. Clarification Statement: Examples of human activities can include urbanization, building dams...”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each human-caused impact, circle each design or refinement, and number the evidence or criteria used to judge the solution. Your marks should show how planners design, evaluate, and improve an environmental solution.

A Plan for Clear Creek

- ① Riverton’s new shopping district replaced fields beside Clear Creek with roofs, parking lots, and wide roads. During rain, water now moves quickly across hard surfaces into storm drains and then into the creek. The runoff carries oil, fertilizer, and sediment. It can also be warmer than the creek water. These changes cloud the water, lower oxygen as pollutants break down, and reduce habitat for aquatic insects. Fewer insects mean less food for fish, frogs, and birds. City planners must reduce these effects while keeping streets safe from flooding and using a budget that residents will support.
- ② To test a solution, planners selected one parking area and designed a system that slows, cools, and filters runoff before it reaches Clear Creek. Permeable pavement lets water soak downward. A rain garden planted with deep-rooted native grasses and flowering plants holds water, traps sediment, and offers insect habitat. Workers will replace one undersized road culvert with a wider, fish-passable culvert, so high water is less likely to block movement along the creek. The team will judge the design by runoff volume, water temperature, sediment, native insect counts, flood safety, cost, and maintenance needs.
- ③ After two storms, the pilot parking area sent 30 percent less water to the storm drain than a similar untreated area. Its runoff was cooler and contained less sediment. Native insect counts in the rain garden rose during the first summer, but the project cost more than expected because the soil clogged near a busy entrance. Inspectors also found an invasive plant, Japanese stiltgrass, at the garden edge. The team decided to add a pretreatment strip that catches grit before water reaches the pavement, remove the invasive plant before it spreads, and monitor results through four seasons. This refinement responds to evidence instead of assuming the first design is complete.

2 ANSWER WITH EVIDENCE _____ Use the passage

- 1** Trace one cause-and-effect pathway from the shopping district to a change that affects biodiversity in Clear Creek.

- 2** Choose two proposed design features. Explain how each feature is meant to reduce harm to the creek or its organisms.

- 3** Using the team's criteria, identify one piece of evidence that shows the pilot was successful and one piece of evidence that shows a limitation.

- 4** Why is adding a pretreatment strip an evidence-based refinement rather than an unrelated new idea?

3 YOUR TURN _____ Your own words

Choose a human activity other than parking-lot runoff that affects a nearby ecosystem. In 100 to 130 words, propose a solution that names the impact, gives at least two design features and how they work, lists three measures for evaluating it, and states one evidence-based refinement you would make if results are weak.

PART 1 • READ AND MARK

Underline each human-caused impact, circle each design or refinement, and number the evidence or criteria used to judge the solution. Your marks should show how planners design, evaluate, and improve an environmental solution. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Trace one cause-and-effect pathway from the shopping district to a change that affects biodiversity in Clear Creek.	Hard surfaces speed runoff into the creek. Runoff carries pollutants and sediment, which cloud water, lower oxygen, and reduce aquatic insect habitat. Fewer insects provide less food for fish, frogs, and birds.
2	Choose two proposed design features. Explain how each feature is meant to reduce harm to the creek or its organisms.	Possible answers: Permeable pavement lets water soak downward; the rain garden holds water and traps sediment while providing insect habitat; the wider fish-passable culvert reduces barriers to movement along the creek.
3	Using the team's criteria, identify one piece of evidence that shows the pilot was successful and one piece of evidence that shows a limitation.	Success evidence includes 30 percent less water reaching the storm drain, cooler runoff, less sediment, or higher native insect counts. A limitation was higher-than-expected cost caused by clogged soil near the entrance.
4	Why is adding a pretreatment strip an evidence-based refinement rather than an unrelated new idea?	The soil clogged near the busy entrance. A pretreatment strip catches grit before it reaches the pavement, so it directly addresses the evidence of clogging.

PART 3 • YOUR TURN (SAMPLE ANSWER)

A small dam on Pine River blocks salmon from upstream spawning habitat and changes the river's sediment flow. I would install a nature-like bypass channel with pools and gentle slopes so fish can travel around the dam. I would also release seasonal flows that better match spring conditions and plant native willows along exposed banks to reduce erosion. I would measure the number of tagged salmon passing upstream, water temperature, bank erosion, and the cost of maintenance. If monitoring shows that few salmon enter the bypass during low flows, I would deepen its entrance and adjust the release schedule. Those changes target evidence from the evaluation.

Accept scientifically plausible cause-and-effect explanations that connect a human activity to ecosystem or biodiversity impacts. For the open task, accept varied solutions when students include design features, measurable evaluation criteria, and a refinement clearly linked to possible evidence.