Creekside Choices

Design for creek life and flood protection

7.9 "Design a solution to maintain biodiversity and ecosystem services in a given scenario."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two ways runoff can harm the creek or nearby homes. Circle two actions the town could take, then number the council's two goals.

A Plan for Cedar Creek

1. Behind Cedar Middle School, a narrow creek runs past a row of homes. After hard rain, water rushes off the school parking lot and carries soil and litter into the creek. Cloudy water blocks sunlight from plants growing underwater. Small fish and insect larvae use those plants for shelter. The creek also carries rainwater away from the homes. When runoff reaches it too quickly, the creek can rise and spill over its banks near the houses. The town wants both healthy creek life and less flooding.

2. The council has money for one construction project. A rain garden beside the parking lot would collect runoff in a shallow planted area, trapping soil and letting some water soak into the ground before the rest reaches the creek. Its native flowers could feed bees and butterflies. A concrete channel would carry water quickly from the lot straight to the creek. It would keep puddles off the parking lot, but it would not filter out soil and litter. Volunteers can also plant shrubs along the creek to hold bank soil in place.

3. The parking lot must stay open for buses, so any garden must fit in the unused strip beside it. That strip gets salty runoff in winter, and the town will need plants that tolerate salt. The council's two goals are to protect shelter for creek animals and lower the chance of water reaching homes. A channel may clear the lot fast, but sending a sudden rush into the creek can increase flooding downstream. Students will present a design that names its parts and explains how the design meets both goals.

2 ANSWER WITH EVIDENCE

Use the passage

1. Which construction project would you choose to protect creek life? Explain the chain of effects that supports your choice.

2. How could your chosen project change the chance of flooding near the homes? Link its effect on runoff to what happens at the creek.

3. Propose a design using the construction money and volunteers. Explain how it meets both council goals.

4. What site condition could make your design harder to use? How would you adjust the design?

3 YOUR TURN

Your own words

At a community garden, a shallow pond shelters frogs and dragonfly larvae. Rain washes soil from a bare path into the pond, clouding the water and clogging watering cans used to collect pond water for vegetables. You may change the path and add plants, but you cannot move the pond. Design a two-part solution and explain how it supports pond life and keeps the water usable.

ANSWER KEY

Creekside Choices

GRADE 7 · 7.9

PART 1 · READ AND MARK

Underline two ways runoff can harm the creek or nearby homes. Circle two actions the town could take, then number the council's two goals. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which construction project would you choose to protect creek life? Explain the chain of effects that supports your choice.	**Choose the rain garden. It traps soil before runoff reaches the creek, so less cloudy water blocks sunlight from the underwater plants that shelter fish and insect larvae.**
2	How could your chosen project change the chance of flooding near the homes? Link its effect on runoff to what happens at the creek.	**The rain garden lets some runoff soak into the ground before it reaches the creek. Less water arriving quickly could make the creek less likely to spill over near the homes.**
3	Propose a design using the construction money and volunteers. Explain how it meets both council goals.	**Build a rain garden beside the lot and have volunteers plant shrubs along the creek. The garden traps soil, helping protect underwater plant shelter, while the shrubs hold bank soil in place. The garden also reduces the rush of runoff that can make the creek spill over near homes.**
4	What site condition could make your design harder to use? How would you adjust the design?	**Winter runoff makes the strip salty, so choose plants that tolerate salt for the rain garden.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would cover the bare path with permeable paving and plant grasses between the path and the pond. The paving would protect loose soil while allowing rain to soak into the ground. Grass roots would hold soil along the edge, and the plants would slow muddy water. With less soil entering the pond, more sunlight could reach underwater plants that shelter pond animals. Less mud would also clog the watering cans.

Accept other designs supported by the passage if students explain effects on both animal shelter and flooding. For the pond task, accept practical two-part solutions that reduce soil entering the pond and connect that change to pond life and usable water.