Creekside Choices

Model the trade-offs of a rain garden

MS-ETS2-2 "Develop a model defining and prioritizing the impacts of human activity on a particular aspect of the environment, identifying positive and negative consequences of the activity, both short and long-term..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline cause-and-effect links in the passage. Circle one short-term and one long-term impact, then number two impacts 1 and 2 to show which you think matters more for creek water quality.

A Garden Where Cars Park

1. After heavy rain, water races across a paved shopping center lot into a nearby creek. It can carry oil, road dust, and bits of trash. A town proposes removing part of the pavement and planting a shallow rain garden in its place. The garden would collect runoff so water can soak into the soil instead of rushing straight to the creek. Engineers sketch a cause-and-effect model: pavement sends fast runoff toward the creek; the garden slows the runoff and traps some pollutants. Their model focuses on the creek's water quality.

2. The model shows benefits and costs at different times. During construction, loose soil could wash into the creek, a short-term harm, unless crews cover it before storms. Soon after planting, the garden could trap some trash and slow runoff, short-term benefits. Over several years, plants and soil could keep catching pollutants, a long-term benefit. However, plants may die without care, and a clogged garden could stop soaking up water, a long-term risk. The town ranks preventing dirty runoff above saving parking spaces because creek life depends on clean water.

3. The store owns the lot, so the town cannot simply build there. Engineers must ask the owner for permission and discuss how losing parking spaces could affect customers. Before recommending the project, scientists should measure creek water during several storms and report results that challenge their plan. They must not promise that the garden will remove every pollutant. If the owner refuses, the team could seek a different site. These limits may slow the project, but they protect trust and property rights.

2 ANSWER WITH EVIDENCE

Use the passage

1. In the engineers' model, how does changing the pavement to a rain garden affect the path of runoff and what reaches the creek?

2. Identify one short-term benefit and one long-term benefit of the rain garden for the creek.

3. Which short-term harm and long-term risk belong in the model? Why does the town rank preventing dirty runoff above saving parking spaces?

4. How could honest scientific work and the store owner's property rights each change what the town does next?

3 YOUR TURN

Your own words

A school plans to replace a muddy path near a creek with a raised wooden walkway. Write a cause-and-effect model with a short-term effect, a long-term effect, a benefit, and a drawback; rank the two effects using a stated reason, then explain one duty to report evidence honestly and one property-rights limit.

ANSWER KEY

Creekside Choices

GRADES 6-8 · MS-ETS2-2

PART 1 · READ AND MARK

Underline cause-and-effect links in the passage. Circle one short-term and one long-term impact, then number two impacts 1 and 2 to show which you think matters more for creek water quality. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	In the engineers' model, how does changing the pavement to a rain garden affect the path of runoff and what reaches the creek?	**The garden lets some runoff soak into the soil instead of flowing straight to the creek, and it traps some pollutants.**
2	Identify one short-term benefit and one long-term benefit of the rain garden for the creek.	**Soon after planting, it could trap trash or slow runoff. Over several years, plants and soil could keep catching pollutants.**
3	Which short-term harm and long-term risk belong in the model? Why does the town rank preventing dirty runoff above saving parking spaces?	**Loose soil could wash into the creek during construction. Later, a clogged garden could stop soaking up water. The town puts clean water first because creek life depends on it.**
4	How could honest scientific work and the store owner's property rights each change what the town does next?	**Scientists must measure creek water and report results even if they challenge the plan. The town needs the owner's permission or must seek another site.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Building the walkway could disturb soil and send mud into the creek for a short time, a drawback. Over time, keeping feet off the muddy bank could reduce erosion, a benefit. I rank the long-term benefit first because it could last for years, while careful construction could limit the short-term harm. Scientists should report muddy-water measurements even if they show a problem. The school must get permission if the path crosses a neighbor's land.

Accept other rankings when students support them with a clear reason. For Part 3, accept plausible effects linked to the walkway and creek, along with a specific duty to report evidence honestly and a property-rights limit.