

Healthy Ecosystems and the Services They Provide: Mastery Check

Learning target: I can show that I understand what ecosystem services are, how living things provide them, how a change in one part of an ecosystem can reach people, and how to evaluate competing solutions for keeping a service.

Retrieval and mastery check

About 35 min

Individual

MS-LS2-5 · assesses

MS-LS2-4 · practice

independent practice

writing

Name _____

Date _____

Period _____

Directions

Answer every item on your own. For multiple choice, circle one letter. For short answers, write complete sentences. Show every step of the calculation in q5. Item q13 asks you to bring several ideas together; plan it before you write.

You will need: This worksheet, Pencil, Calculator

Part A: Retrieval (items q1-q12)

1. Which of these is an ecosystem service? 2 pts
 - ☐ A. A factory makes fertilizer for farms.
 - ☐ B. A wetland traps mud and extra nutrients before river water reaches a lake.
 - ☐ C. A city pipes water from a reservoir to homes.
 - ☐ D. A volunteer group plants trees along a creek.
2. Which example is matched with the correct kind of ecosystem service? 2 pts
 - ☐ A. Hiking in a redwood forest: supporting
 - ☐ B. Soil formation: cultural
 - ☐ C. Lumber for building houses: provisioning
 - ☐ D. Nutrient cycling: provisioning
3. If animal pollinators disappeared, which crop's harvest would be affected least? 2 pts
 - ☐ A. Almonds
 - ☐ B. Apples
 - ☐ C. Squash
 - ☐ D. Wheat

4. Most almond varieties need cross-pollination. Explain what that means and why growers plant two varieties in alternating rows and bring in bees. 3 pts

Teaching numbers for q5 (teaching dataset)

Simulated teaching dataset: the numbers are invented to be realistic, not measured.

Choice for keeping the town's water clean	Cost to build	Cost each year
Build and run a filtration plant	\$60 million	\$3 million
Protect the forested watershed (buy land, farm programs, monitoring)	\$0	\$1.5 million

Invented values for a made-up town, for teaching only.

5. Using the teaching numbers, find the total cost of each choice over 20 years and how much money protecting the watershed would save. 3 pts

6. True or false: 'Losing the vultures in India could only affect other scavengers, not people.' Circle your answer and explain, tracing at least three links. 3 pts

☐ True ☐ False Explain your thinking:

7. Nearly all Cavendish banana plants are genetic copies of one another. Explain why that makes them vulnerable to a new disease, and how wild bananas could help. 3 pts

8. Draw a side view of a beach with a vegetated sand dune between the ocean and a road. Show storm waves, label where plant stems and roots hold sand, and draw an arrow showing where sand from the dune can go during a big storm. 3 pts



9. A town restored a sand dune instead of building a seawall. Which evidence would best show that the dune is maintaining an ecosystem service? 2 pts
- ☐ A. The dune looks more natural than a concrete wall.
 - ☐ B. Over five winters, the beach stayed about the same width and storm water reached the road less often.
 - ☐ C. The dune cost less to build than a seawall would have.
 - ☐ D. More tourists visited the beach during one summer.

10. Which evidence would best support the claim that losing vultures caused more human deaths in India? 2 pts
- ☐ A. A graph showing feral dogs increasing while vultures decreased
 - ☐ B. A comparison showing death rates rose after the drug spread in districts that had many vultures, but not in districts that never had many
 - ☐ C. Photos of feral dogs feeding at a carcass dump
 - ☐ D. A survey showing that many people disliked vultures

11. New York City's main water supply comes from a protected, mostly forested watershed. Why is the water still disinfected, and why can water that looks clear still be unsafe? 3 pts

12. Replacement cost is one way to estimate what an ecosystem service is worth. Give one reason it can make a service seem worth more than it is and one reason it can make a service seem worth less. 3 pts

Part B: Synthesis (item q13)

- 13.** Choose one problem from this chapter: almond pollination, coastal flooding, clean drinking water, vineyard pests or banana disease. In one paragraph, name the ecosystem service involved and its category, state one criterion and one constraint for a solution, compare two competing solutions using evidence, and say which one better maintains both the service and biodiversity, and why. 5 pts

Four questions to ask yourself

1. Who benefits? An ecosystem service benefits people and is done by the ecosystem. 2. Which living things or processes do the work (pollinators, decomposers, roots and soil, scavengers, predators, wild relatives)? 3. If one part changes, what changes next, and next after that? 4. When comparing solutions, what does each one do to the service and to biodiversity, and what does it cost?

Write the hardest question

Write one new multiple-choice item that tests the difference between a natural resource and an ecosystem service. Give four options, mark the correct one, and write one sentence for each wrong option explaining why a student might choose it. Then write one sentence explaining why stone and metals are natural resources but are not counted as ecosystem services.