

Changing Ecosystems: Mastery Check

Learning target: I can recall and apply the main ideas of changing ecosystems, from succession to cascading change, and argue with evidence why one disturbed landscape recovered faster than another.

Retrieval and mastery check

About 40 min

Individual

MS-LS2-4 · assesses

MS-LS2-1 · supports

MS-ETS1-1 · practice

independent practice

writing

Name _____

Date _____

Period _____

Directions

Work on your own. Part A has eleven items that check what you remember and can apply; Part B asks you to write a short argument. For multiple-choice items, circle one letter. For other items, answer in complete sentences and show calculations. Item 12 asks you to look back at your first explanation on Worksheet 1, so have it with you if your teacher allows. The total is 23 points.

You will need: This worksheet, Pencil, Calculator, Worksheet 1 (for item 12)

Part A: Retrieval and application (items 1 to 11)

1. Why do ecologists call every ecosystem a **dynamic system**? 1 pt
 - ☐ A. Its populations and conditions are always changing, slowly or quickly.
 - ☐ B. It changes only when people disturb it.
 - ☐ C. It moves to a new place every few years.
 - ☐ D. It changes once after a disaster and then stays the same.
2. Which of these is a **sudden** change caused by **people**? 1 pt
 - ☐ A. A pond slowly filling with sediment over centuries
 - ☐ B. A volcano erupting
 - ☐ C. Bulldozers clearing a forest for a new housing tract
 - ☐ D. A glacier melting back over many decades
3. Classify each as primary or secondary succession and give the clue that decides it. (a) A landslide strips a mountainside down to bare bedrock. (b) A forest is logged, but the soil, stumps and roots are left behind. 2 pts

4. Prairie lupine was one of the first plants to grow on the Mount St. Helens Pumice Plain. Which feature made it a successful pioneer species there? 1 pt
- ☐ A. It grows best in deep shade under tall trees.
 - ☐ B. Bacteria in its roots change nitrogen from the air into a form plants can use.
 - ☐ C. It needs thick, rich soil before it can sprout.
 - ☐ D. Its seeds drift long distances on ocean currents.

5. True or false: 'The 1980 eruption killed every living thing in the blast zone, so all of the recovery came from organisms that arrived later.' Circle your answer and support it with one piece of evidence. 2 pts
- ☐ True ☐ False Explain your thinking:

6. A beaver is a living thing, but the change its dam makes to a stream is mostly a change to **physical** components. Name two physical components a dam changes, and for each one name a population that responds. 2 pts

7. Teaching numbers (invented for this quiz): On one reef, divers counted 2 purple sea urchins per square meter before a disease killed most of the sea stars that eat urchins, and 18 per square meter three years later. Kelp covered 60 percent of the reef before and 6 percent after. (a) How many times as many urchins were there after? (b) By what percent did kelp cover decrease? Show both calculations. 2 pts

8. Draw a flow diagram of the cascading change in item 7, starting with the sea star disease. Use at least four boxes joined by arrows, and label each arrow with what changes (for example, 'fewer predators eat urchins'). 3 pts



9. Which evidence would most strongly support the claim that prairie dog colonies increase burrowing owl populations? 1 pt
- ☐ A. A photograph of an owl standing at a prairie dog burrow
 - ☐ B. A rancher's memory that owls disappeared when the prairie dogs did
 - ☐ C. Owl nest counts on 20 colonies and on 20 similar grasslands without prairie dogs
 - ☐ D. Five owl nests counted on one colony in a single year

10. Cattle egrets crossed the Atlantic Ocean from Africa to South America on their own in the late 1800s, then spread into North America, helped by farmland and livestock. Which description fits them best? 1 pt
- ☐ A. An introduced species, because they now live where they did not live before
 - ☐ B. An invasive species, because they spread over a large area
 - ☐ C. A species that expanded its range on its own, so people did not introduce it
 - ☐ D. A keystone species, because they follow cattle

11. Engineers rebuilding a coastal marsh write two goals: 'New marsh land forms every year' and 'The project must not raise flood risk for homes behind the levee.' Which is a criterion and which is a constraint? Then explain why a gated diversion that can be closed during floods might be chosen next to a city, while an open channel might work where few people live. 2 pts

Part B: Synthesis (item 12)

12. Look back at the first explanation you wrote on Worksheet 1 (Part C). Now write an improved argument that answers this question: **Why did the blowdown zone at Mount St. Helens recover faster than the Pumice Plain?** Make a claim, give at least two pieces of evidence about what each zone had or lacked after the eruption, and explain your reasoning using at least three of these terms: disturbance, primary succession, secondary succession, pioneer species, biological legacy. End with one sentence about how your thinking changed since Worksheet 1.

5 pts

Open-notes option and a planning box

If your teacher allows notes, you may use the Worksheet 2 word bank and your Worksheet 3 answers. Before writing item 12, make a two-column list headed 'Blowdown zone' and 'Pumice Plain', and under each write what was left after the eruption (soil? survivors?) and what had to arrive. Then write your claim from the difference between the columns.

Write the next exam question

Write one new question that would test whether a classmate really understands the difference between a pattern in data and a cause. It must include a small invented data table (label it as invented), four answer choices or a short-answer prompt, and a full answer key that explains why the wrong choices are wrong. Swap with a partner and solve each other's questions.