

Rock Cycle Check: Retrieval Practice and a Short Synthesis

Learning target: I can recall how the three rock types form, trace routes through the rock cycle, match each process to its energy source, and explain the cycling of Earth's materials in a short written synthesis.

Retrieval and mastery check

About 35 min

Individual

MS-ESS2-1 · assesses

independent practice

writing

Name _____

Date _____

Period _____

Directions

Work alone and without notes; this sheet shows what you have learned, so an honest attempt is more useful than a perfect one. Part A has twelve mixed items: circle one answer for multiple choice, write briefly for short answers, show your work for the calculation, and sketch clearly for the drawing item. Part B is a short synthesis paragraph. Points are shown for each item; the sheet totals 30 points.

You will need: This worksheet, Pencil

Part A: Retrieval (24 points)

1. Which statement about metamorphic rock is correct? 2 pts
 - ☐ A. It forms when rock melts partway and then cools with a new texture.
 - ☐ B. It forms when heat and pressure change a rock's texture or minerals while the rock stays solid.
 - ☐ C. It forms when sediment is pressed and glued together under deep burial.
 - ☐ D. It forms only from sedimentary rock, never from igneous rock.
2. An igneous rock has interlocking crystals about 6 mm across. What does this tell you? 2 pts
 - ☐ A. It cooled quickly from lava at the surface.
 - ☐ B. It cooled slowly from magma underground.
 - ☐ C. It was weathered into large grains.
 - ☐ D. It formed from shells pressed together.
3. True or false: A rock must become sedimentary rock before it can become metamorphic rock. 1 pt
 - ☐ True ☐ False Explain your thinking:

4. Loose sediment becomes sedimentary rock by two steps: _____, when the weight of overlying layers squeezes the grains together, and _____, when minerals carried by water glue the grains to each other. 2 pts

5. Which energy source drives weathering, erosion and deposition at Earth's surface? 2 pts
- ☐ A. Heat from Earth's interior
 - ☐ B. Energy from the Sun, with gravity pulling material downhill
 - ☐ C. Pressure from colliding plates
 - ☐ D. Heat released by crystallizing magma

6. Pumice is a frothy rock that is mostly glass with tiny holes. Explain how it cooled and why it has almost no visible crystals. 2 pts

7. A cliff of sandstone loses about 2 mm of rock from its face each year to weathering and erosion. At that rate, how many years would it take to wear back 10 meters? Show your work, including the unit conversion. 3 pts

8. Draw two circles side by side. In the first, sketch the crystals of an **intrusive** igneous rock as they would look under a hand lens; in the second, sketch an **extrusive** igneous rock. Label each circle with where the rock cooled and how fast. 3 pts

9. A geologist says, 'The rock cycle has no beginning and no end.' Explain what she means, with one example of a rock changing into a type that is not the 'next' one in a simple loop. 2 pts

10. Which observation is the strongest evidence that a rock is sedimentary?

2 pts

- ☐ A. It is dark gray in color.
- ☐ B. It is made of rounded grains glued together in flat layers, some containing shell fragments.
- ☐ C. It has interlocking crystals pointing in all directions.
- ☐ D. It is very hard and has wavy bands of flattened crystals.

11. Which energy source drives the deformation of rock into banded metamorphic rock, and why can the Sun not do this job?

2 pts

12. Name the one process that must happen before any rock can become igneous rock.

1 pt

Part B: Synthesis (6 points)

13. A clam shell lies on a beach. Describe **two different routes** by which the material in that shell could end up as part of an igneous rock. For each route, name every rock type or material along the way, the process for each change, and the energy source behind each process. One route must pass through a metamorphic stage and the other must not.

6 pts

Memory hooks

If you get stuck, use these hooks. Rock types by how they formed: igneous = from a melt; sedimentary = from pieces, shells or dissolved material deposited and cemented; metamorphic = changed while solid. Crystal size: slow and deep means big; fast and shallow means small. Energy: Sun at the surface (weathering, erosion, deposition); Earth's interior underground (melting, metamorphism, uplift); gravity pulls things down everywhere. For q13, start the shell on the seafloor and ask at each step: 'What has to happen next, and what energy makes it happen?'

Write the item that would catch you

Look back at the item you found hardest. Write a new question on the same idea that would catch someone who still holds the misunderstanding you nearly made, including the answer and a sentence on why the wrong choice is tempting. Then write a second question on an idea this sheet did not test at all (for example, how dissolved material becomes rock, or how uplift brings deep rock to the surface), with its answer. Trade with a partner and answer each other's questions.