

Making Sandstone

Overview: When you look at a piece of sandstone under a magnifier, you'll notice tiny, sand-sized grains that look like they're glued together. We're not only going to make our own version of sandstone, but we'll even press an object into it to make a fossil impression.

What to Learn: Sandstone is a common sedimentary rock that's composed of quartz crystals cemented together by silica, calcium carbonate, clay or iron oxide. Fossils are often found in sandstone.

Materials

- 2 paper cups
- Water
- Popsicle stick
- Sand
- Plaster of Paris
- Shell (something to make a fossil impression of)
- Scissors

Experiment

1. Pour enough sand to cover the bottom of one of the cups.
2. In the second cup, make a 1:1 mixture of Plaster of Paris and water. (You can add food dye to make the plaster more visible when layered, but this is optional.)
3. Stir to combine with the popsicle stick.
4. Pour a layer right on top of the sand.
5. Add more sand to the first cup.
6. Now add more plaster.
7. Continue adding in layers until you have at least six layers (three of each), but you can do more if you have enough room and materials.
8. Do not mix the layers.
9. Cover the last layer with sand.
10. If you're making a fossil impression, first rub vegetable oil over it (so the sand doesn't stick) and press firmly into place without twisting or pushing too hard. Allow it to dry for 24 hours.
11. When it's dry, carefully remove the fossil on top and see the impression you've made!
12. Tear away the cup to see the different layers of your homemade sandstone.

Reading

One way geologists classify sandstone is by the amount of quartz, feldspar, and lithic grains it contains. Quartz sandstone is composed of more than 90% quartz grains, while feldspathic sandstones has less than 90% quartz, but more feldspar than lithic grains. Lithic sandstones have both less than 90% quartz and more lithic grains. In addition, if a geologist calls a sample "clean sandstone," then it means that there are tiny holes in the sample, like pores. They'll add the word "arenite" to the name, so you might hear "quartz arenite" which means a sandstone that has more than 90% of its grains as quartz and is also porous.

Exercises

1. What elements is calcium carbonate made out of?
2. How does this experiment look like sandstone?
3. What do you know about a feldspathic arenite sample?

Answers to Exercises: Sandstone

1. What elements is calcium carbonate made out of? (carbon and oxygen.)
2. How does this experiment look like sandstone? (The tiny grains of sand are glued together by the plaster of Paris.)
3. What do you know about a feldspathic arenite sample? (The sample has less than 90% quartz, but more feldspar than lithic grains, and it's porous.)