Geological History

Investigation Data Sheet

Earth Science IN ACTION™

Reading Sedimentary Rock Layers

Sedimentary rock is a kind of time line that tells scientists when things happened in Earth's history.

When geologists get a good look at nice, orderly rock layers, it's easy to tell which are older and which are younger. Since old rock layers are usually laid down first, they are the lower layers. But things aren't always so neat and orderly. The forces acting on the Earth's crust can sometimes fold, or even invert, layers of rock. Sometimes, unusual formations of rock cut across the orderly arranged layers. Geologists call these out-of-place formations of rock "intrusions."

Objective

Create a model of four types of simulated rock to show how geologists can "read" rock layers to tell a lot about Earth's history, even when there are unusual formations in the rock layers.

Materials

__ scissors
__ a measuring cup
__ four plastic cups
__ a bag of white sand
__ a partner
__ glue
__ a small, empty milk carton
__ eight plastic spoons
__ a pencil
__ red, yellow, blue and green food coloring

Safety Notice: All applicable laboratory safety rules must be followed. Students should not perform any experimental activity without the teacher's supervision and express permission. Students must follow safety guidelines and wear appropriate protective gear.

Procedure

1. To prepare the rock sample holder, use the scissors to carefully cut off the top of the small milk carton.
2. To create the simulated "rock," measure four generous spoonfuls of glue into a cup. Then, add eight drops of red food coloring to this cup. Now, measure out 120 milliliters of sand and pour it into the cup with the glue and red food coloring. Use the spoon to mix the sand, glue and red coloring thoroughly.
3. Place the pencil inside the milk carton, standing straight up.
4. While you are holding the pencil in place, your partner should spoon the sand/glue mixture into the milk carton, smoothing it so it is flat.
5. Using a new spoon and cup, repeat this procedure to make a yellow sand mixture. Your partner should add the new layer of sand/glue mixture to the carton right after it's mixed.
6. Now do the same thing again with a blue sand mixture. The different colored glue/sand mixtures represent the different horizontal layers of sedimentary rock.
7. When all three layers have been placed in the carton, carefully pull the pencil out of the layers of colored sand, being sure that a pencil-sized hole is left behind, extending down through all the layers.
8. Next, using a new spoon and cup, mix two spoonfuls of glue with four drops of green coloring and 60 mL of sand to make the green colored sand/glue mixture.
9. Carefully place the green mixture on top of the other sand/glue layers, using a pencil as a plunger to fill the hole in the sample rock. Try not to disturb the sides of the hole and try to fill it all the way down.
10. Let the material in the milk carton dry overnight.

    • Predict what you'll find before peeling the carton away from the layers of colored sand.

11. Peel the carton away from the simulated rock. Draw and label a diagram of the rock layers. Which is the intrusion?

    • What do you see? Was it what you expected?

Conclusions

• If you were a geologist, what would the green layer mean to you?