

## CHAPTER 5

# GENESIS: CONCORDIST INTERPRETATIONS

## MAKING “ROCKS” FROM CRAYONS

**B**y studying rocks carefully, geologists can learn a lot about how and when the rocks formed. Geologists often classify rocks as *sedimentary*, *metamorphic*, or *igneous* based on how they formed.

To illustrate the process of rock formation, try this fun activity with your family. (Children will need supervision.) You'll need

- ▶ crayons of several colors
- ▶ pencil sharpener or knife (a plastic knife will work)
- ▶ aluminum foil
- ▶ bowl or beaker
- ▶ hot tap water
- ▶ bowl of ice, warm water, or sand
- ▶ hot plate or stove

**Step 1:** Erode existing rock. (In real life, rocks are eroded by wind, water, or ice.)

- ▶ Using the sharpener or knife, erode the crayons into tiny shavings and pieces.
- ▶ Gather up the crayon *sediment*.

**Step 2:** Make *sedimentary rock*. (Sedimentary rock is formed when sediment is compressed with chemical reactions to help it cement together. Sandstone and limestone are sedimentary rocks.)

- ▶ Take a sheet of aluminum foil and pile up the crayon sediment. If you have several colors of crayon sediments, try piling them in colored layers.
- ▶ Wrap the aluminum foil several times over the crayon sediment to make a packet.
- ▶ Expose the packet to high pressure. Place the packet on a sheet of newspaper; then stomp on the packet with your heel.
- ▶ Carefully unwrap the packet and pull out your sedimentary rock.

Just like real sedimentary rock, the resulting crayon creation is brittle and easily eroded. Note that a real sedimentary rock would also have chemicals to glue the sediment together. It's OK to play with the rock; it doesn't matter if you break it before the next step.

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**Step 3:** Make *metamorphic rock*. Most metamorphic rock is formed when rock or sediment is compressed under both high pressure and heat. Quartzite is a metamorphic rock made from sandstone, and marble is a metamorphic rock made from limestone.

- ▶ Rewrap your rock and any remaining sediment in foil, making sure the packet is waterproof.
- ▶ Fill a bowl or beaker with the hottest tap water available. Apply heat to the rock by holding it under the water for about a minute.
- ▶ Apply pressure to the packet by stomping on it again as in step 2.
- ▶ Let the packet cool briefly, and then unwrap your metamorphic rock.

Just like real metamorphic rock, your crayon creation is less fragile than sedimentary rock and more difficult to erode. Layers and individual colors are merged together but not uniformly mixed together.

**Step 4:** Make *igneous rock*. Igneous rock is formed when rock is melted at very high temperature, such as in the Earth's upper mantle, then cooled either underground or on the surface after a volcanic eruption. Granite, obsidian, and basalt are igneous rocks.

- ▶ First, set up a place to cool the metamorphic rock after you melt it. (Just as it does for real igneous rocks, how it cools makes a big difference in its final appearance.) You can use a bowl of ice, a bowl of warm water, or a container of sand.
- ▶ Form a piece of aluminum foil into a bowl shape. (Make sure it doesn't have holes or cracks on the bottom.)
- ▶ Place the metamorphic rock and any remaining sediment in the foil and melt the material over a hot plate or stove element. (Do this slowly! Do not let the crayon boil or it will spatter.)
- ▶ Pour out the "molten" rock (flowing lava or magma) onto your cooling surface and let it cool.

Just like real igneous rock, the result can be hard and dense or full of air bubbles, depending on how quickly it cooled and in what environment. And just like real igneous rock, the original colors and texture of the sediment can no longer be seen.

**Step 5:** Back to step 1.

- ▶ If you want, take the igneous rock and repeat steps 1-4.

In real life, rocks move through all of these stages, forming and reforming.