Day One, April 13

Erosion

You learned that water can weather rock and erode soil. These processes change Earth's surface and, when a lot of water is flowing, these changes can happen fast. Think about the last time there was a storm where you live. During a storm, rainwater can erode soil very quickly. You might see splashing rain drops, moving soil on a bare spot of ground. When the rainwater hits the soil, it loosens the soil at the surface. This is the beginning of erosion. The water splashes bits of soil and small rocks and starts to flow downhill. When it rains enough, small streams start to form. Eventually, small streams join together into larger streams and then rivers. The force of this water carries bits of rock and soil along with it. So, within minutes or hours, a heavy storm can cause a lot of erosion.Rainwater can also weather rock. Think about the stream during a heavy rainstorm again. As the water rushes over the ground, the bits of sand and soil that it carries slowly grind down the rock they flow over. Some of the rainwater also flows down into the soil and rock. Very slowly, the water mixes with some of the minerals in the rock and soil. Minerals are the chemicals that rock is made out of. Because the minerals are mixed with the water, they are carried away as the water flows. The movement of these minerals changes the structure of the rock. In these ways, rainwater weathers rock.

Look at this photo of a muddy river after a rainstorm. Explain how rainwater causes weathering and erosion. Be sure to include these terms: storm, rainwater, soil, weathering, and erosion.

Day Two, April 14

2. Rainwater Causes Deposition

Over time, rain weathers rock. It also erodes large amounts of material. What happens to the eroded bits of rock and soil? The rainwater carrying sand, rock, and soil will eventually stop moving. When the water stops moving, it deposits the sand, rock, or soil in new areas. These small pieces of sand, rock, and soil are now sediment. Sediment is any eroded material, such as weathered rock, sand, and soil, that is deposited in a new place.

As the rain slows, the rainwater flowing over the ground starts to slow down. Usually, larger pieces of material settle and are deposited first. During a heavy rainstorm, you might see a small layer of rocks on the sidewalk. As the rain turns into a drizzle or stops completely, the water deposits the smaller pieces of material such as sand or soil.

Deposition Makes Layers

Sometimes rainwater deposits sediment in more than one layer. After a storm, you might see a layer of dried mud covering some of the sidewalk or street. This mud is made of many tiny pieces of sediment. If it rains again several days later, a new layer of sediment will be deposited on top of the first layer. The new layer might be made of a different type of sediment. So, you might see different colors or textures from the original layer of mud.

Look at the image of the road and curb. Suppose a large storm came and deposited mud in the driveway. Then, that mud dried. Two more storms came and deposited more mud, each of a slightly different color. Draw what the three layers of deposited mud might look like.

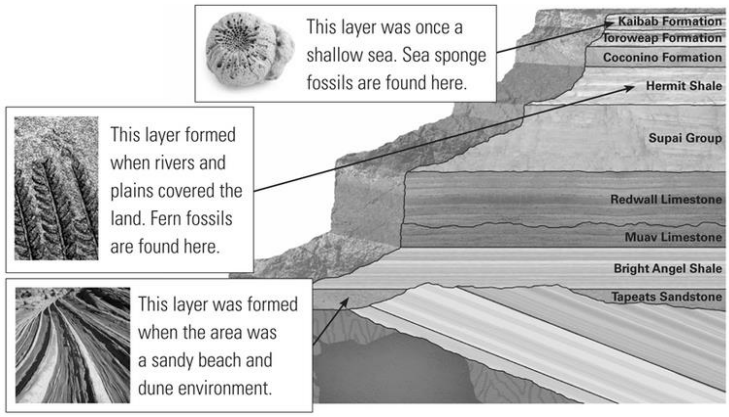
Day Three, April 15

3. Deposition Helps Form New Rocks

Suppose you are at the Grand Canyon. You may notice that it is made of many layers of different colored rock. Where did

these layers come from? These layers of rock were formed by deposition. Much of this material was deposited by water at different times. Some of the rocks in the Grand Canyon are 2 billion years old! Remember how rainwater can deposit layers of sediment along the sidewalk? On some places on Earth, the same thing happens on a much larger scale. Many large rivers deposit huge amounts of sediment where they slow down or reach the sea. After many years, these sediments can add up to form a deep layer. Sometimes the environment changes, and a new kind of sediment starts being deposited. This forms a different layer. New layers always form on top of the older layers. As more sediment is deposited, the sediment is buried and changes over time.Sediment is heavier than water. The layers on top push down on the layers beneath them, and the pieces of rock and soil get smashed together. Minerals from the water can act like glue to help the pieces stick together. Eventually, the material can become solid rock. Rock that is formed from deposited sediment is called sedimentary rock. Many of Earth's surface rocks are sedimentary rocks.

Examine this diagram of rock layers in the Grand Canyon. Where
did the rock layers come from? Write a paragraph to explain the processes that made the layers. Make sure to use these terms:
sediment, layers, deposit, and sedimentary rock.

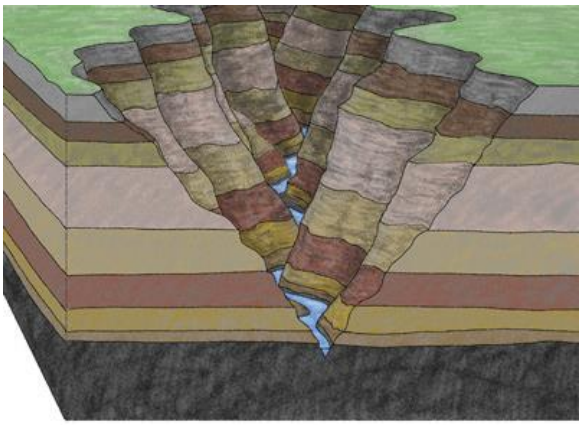


Day Four, April 16

4. River Water Weathers and Erodes
Weathering, erosion, and deposition can happen very quickly, but it usually takes a long time for them to change a whole

landscape. The Grand Canyon was carved by these processes, but it took millions of Years. A canyon is a deep valley carved by water in an area of rock. The Grand Canyon is one of the deepest canyons in the world. At the bottom of the Grand Canyon flows the Colorado River. Millions of years ago, this river started flowing and weathering the rock in the area.

Weathering alone cannot carve a canyon. Erosion must also happen. As the Colorado River carried huge amounts of sediment from the canyon to the ocean, the water eroded the rock. Most scientists think it took about 6 million years for the river to weather and erode the whole Grand Canyon. Recently, other scientists found new evidence that the canyon might be over 17 million years old. Scientific explanations can change and improve with new evidence. Erosion and weathering can make an area look completely different. The Colorado River still runs through the Grand Canyon, deepening it over time.



How was the Grand Canyon created? In your answer, be sure to use these terms: canyon, river, weathering, erosion, and rock.

Day Five, April 17

5. Ice Causes Weathering and Erosion

You learned how liquid water can cause material on Earth's surface to weather, erode, and be deposited. Frozen water can

also cause these changes on Earth's surface.

One way ice can weather rocks is with ice wedging. Ice wedging is a process in which cracks in a rock get bigger from water inside them freezing. Ice wedging happens because water takes up more space as it freezes into ice.

First, a rock with a crack in it fills up with liquid water from rain or some other source. Then the temperature drops below freezing. The water starts to freeze and expand. Ice takes up more space than liquid water. The expanding ice pushes against the inside of the crack. It spreads the sides of the rock apart and makes the crack bigger. When the weather warms up, the ice melts. Since the crack is now larger, more water can get in and freeze. This pattern repeats. Each time the water freezes, it expands, and the crack gets bigger.

Erosion also happens with ice wedging. The ice wedging causes bits of rock to break off. These pieces that the ice breaks off do not always stay in the crack. Often the melted ice, rain, or other sources of water carry these bits of rock away from the crack. Gravity can make the pieces fall out too. In these ways, the weathered rock erodes.

Annotate this image to explain how ice caused changes to this rock.

Include these terms: ice, water, freezes, expands, and crack.