Chapter 9 The History of Life on Earth &
Chapter 8 Studying Earth's Past
Life Science

Name:
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Use the textbook pgs. 239 and 240

of the geologic record. Figure 1 shows how each type of rock can become any other type of rock through the rock cycle. For example, all rock can melt to form magma. Igneous rock forms when magma cools. Metamorphic rock forms when any type of solid rock changes into another type of rock because of temperature or pressure changes. Sedimentary rock is the kind of rock that forms from fragments of other types of rocks. Sedimentary rocks are the most useful rocks for relative dating.

p.239 Weathering, Erosion, and Deposition

When rocks are exposed on Earth's surface, they can be broken down into smaller pieces, or weathering. Rocks can be weathered when physical processes crack and break the rock. Chemical weathering can take place as rock material reacts with water or air. Through weathering, all three rock types can break down to form sediment. Sediment is composed of rock fragments, material dissolved in water, and sometimes, biological debris. Erosion is the process that moves sediment from one place to another. Water, wind, ice, and gravity can cause erosion. Eventually, sediment is deposited in a new location. Deposition is the process in which material is laid down or dropped. Because the sediment is loose when it is deposited, it settles into relatively flat layers. A new, flat layer of sediment rests on top of whatever rock or other sediment is already in place. So, new layers of sedimentary rock are almost always flat. The results of erosion and deposition in Death Valley in California are shown in Figure 2.

Formation of Sedimentary Rock

After loose sediment is deposited, it may be lithified, or hardened into sedimentary rock. In this process, the sediment is compacted and the grains of sediment are cemented together. Fossils form if biological debris or a trace of animal activity remains in a rock. The fossils are a record of the kind of life that existed where the sediment was deposited. And the type of rock that forms with a fossil can give clues about the environment in which the organism lived.

The type of rock that forms in any area depends on local conditions. So, no single rock layer is found in all areas of Earth. And during any one period of geologic time, many types of rock were forming in different areas of Earth. Therefore, no single area or history of an area can contain the geologic record for all of Earth.

Figure 2 These mountains in Death Valley have been weathered, and the sediment has been eroded. The sediment has been deposited in a flat layer below the mountains.

7.3.c Students know how independent lines of evidence from geology, fossils, and comparative anatomy provide the bases for the theory of evolution.

7.4.c Students know that the rock cycle includes the formation of new sediment and rocks and that rocks are often found in layers, with the oldest generally on the bottom.

p240 **Figure 3** These rock layers are in Red Rock Canyon in California. Rock layers are like pictures stacked over time-the younger ones are at the top of the stack over the older ones.