As geologic time creeps along, Earth’s crust continues to change in both subtle and monumental ways. From 400–800 mya (September–October), the towering mountains that once dominated the landscape were worn away to a flat and featureless plain during a long period of erosion. Shallow seas advanced and receded over this lowland, depositing gravel, sand and mud, which would in turn result in layers of new rocks (D).

About 1275 mya, Earth’s crust was on the move, great blocks shifted along fault lines that later filled with magma, which cooled to form a dark igneous rock called diabase (C). Where the magma followed vertical faults, the resulting intrusion is called a dike (C1), where it flowed in spaces parallel to sedimentary layering, it is called a sill (C2), as seen in the layers of the Apache Group (D) rocks beyond the dike to the right. As the Precambrian drew to a close, the landscape was again worn down by erosion, allowing oceans to cover the land. On and on, the cycle has repeated, and continues to do so.

Missing Links
When prolonged erosion wipes out a portion of the geologic record like pages torn from a history book, the gap is called an “unconformity.” An example can be seen at the line of contact (U) between the sequence of much younger sedimentary rocks in the Apache Group (D), above this panel, and the much older Oracle Granite (B) below it. The Scanlan Conglomerate, at the base of the Apache Group, was deposited directly onto the older, weathered Oracle Granite. This unconformity represents perhaps 200 million years of missing rock history!

Rocks from the Apache Group are visible from the San Pedro Overlook on the Mt. Lemmon Highway as you look down on the hilltops below.

Mountains, and the rocks they are made of, may appear to last forever, but they are being created, altered and destroyed in a continuous cycle of transformation, posing the question of which came first? All three main types of rocks are found in the Catalinas.

Igneous rocks are produced by molten magma that cools slowly, deep below Earth’s surface, creating crystalline plutonic rocks like granite, or magma that erupts onto the surface as lava to cool rapidly and form volcanic rocks such as basalt. A pluton is a large mass of igneous rock formed deep underground.

Metamorphic rocks arise from igneous or sedimentary rocks that re-crystallize under extreme heat and pressure, just short of melting back into magma. Metamorphic rocks, such as schist and gneiss, often show banded or lined structures. Rocks exposed at the surface are subject to weathering by water, wind and gravity. Over time, eroded rock fragments settle into layered deposits or sediments. The intense pressure of accumulated layers creates sedimentary rocks such as sandstone and shale. Another sedimentary rock, limestone, forms in shallow seas from the remains of shells, coral and other sea invertebrates.