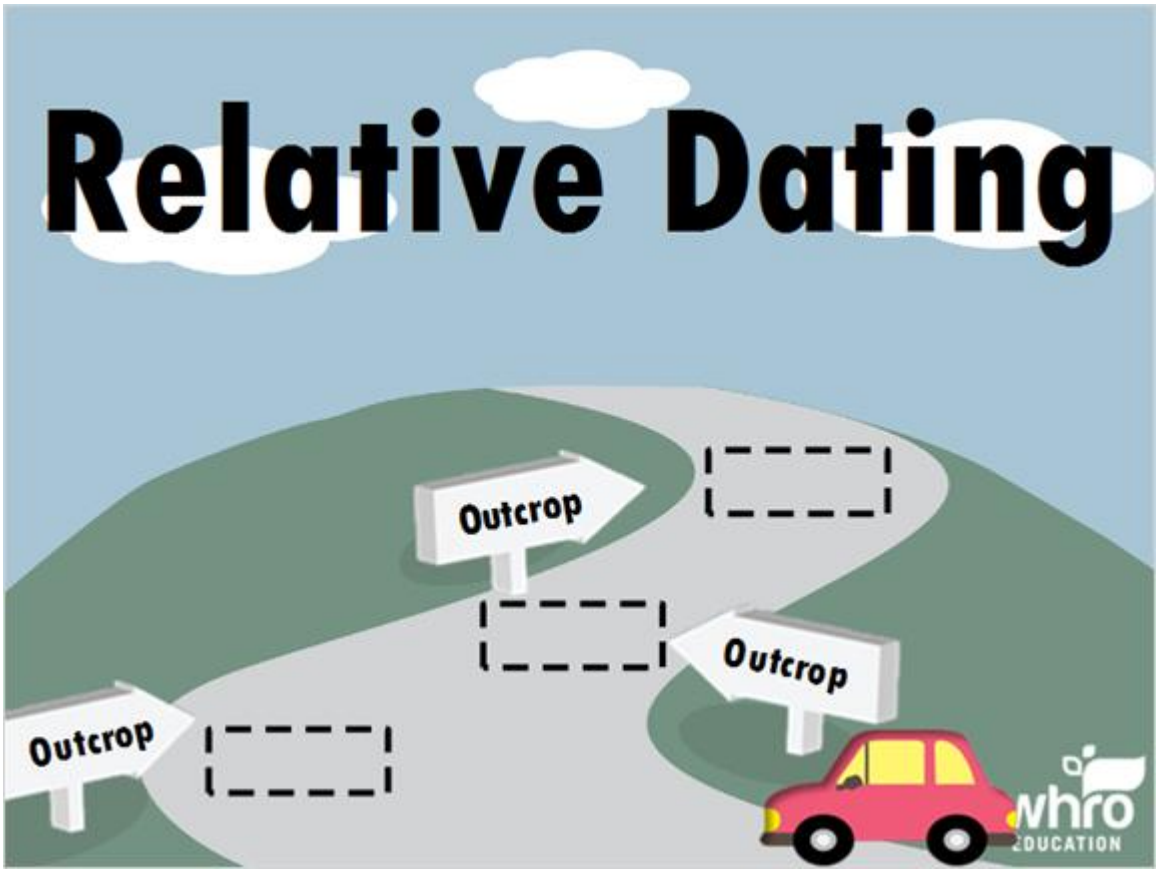
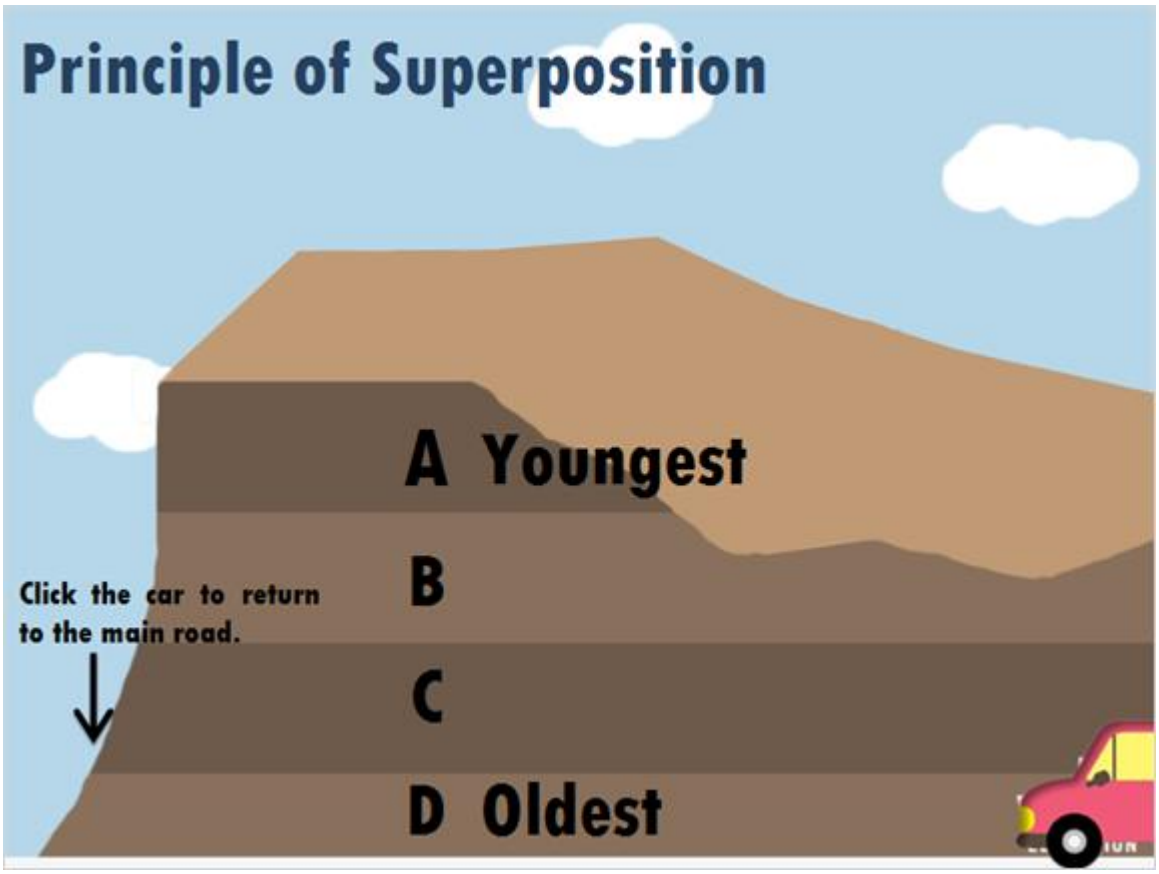
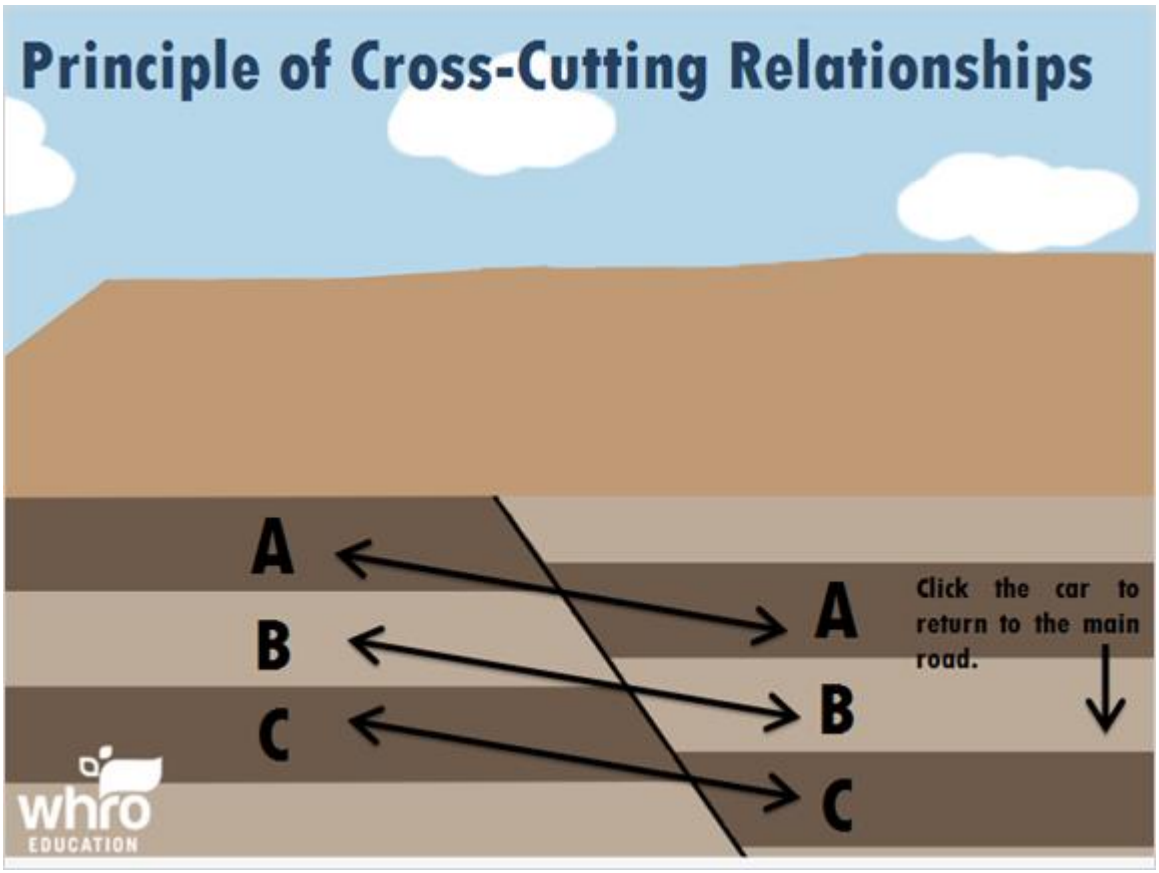
Module 9: Earth's History
Topic 1 Content: Relative Dating Notes



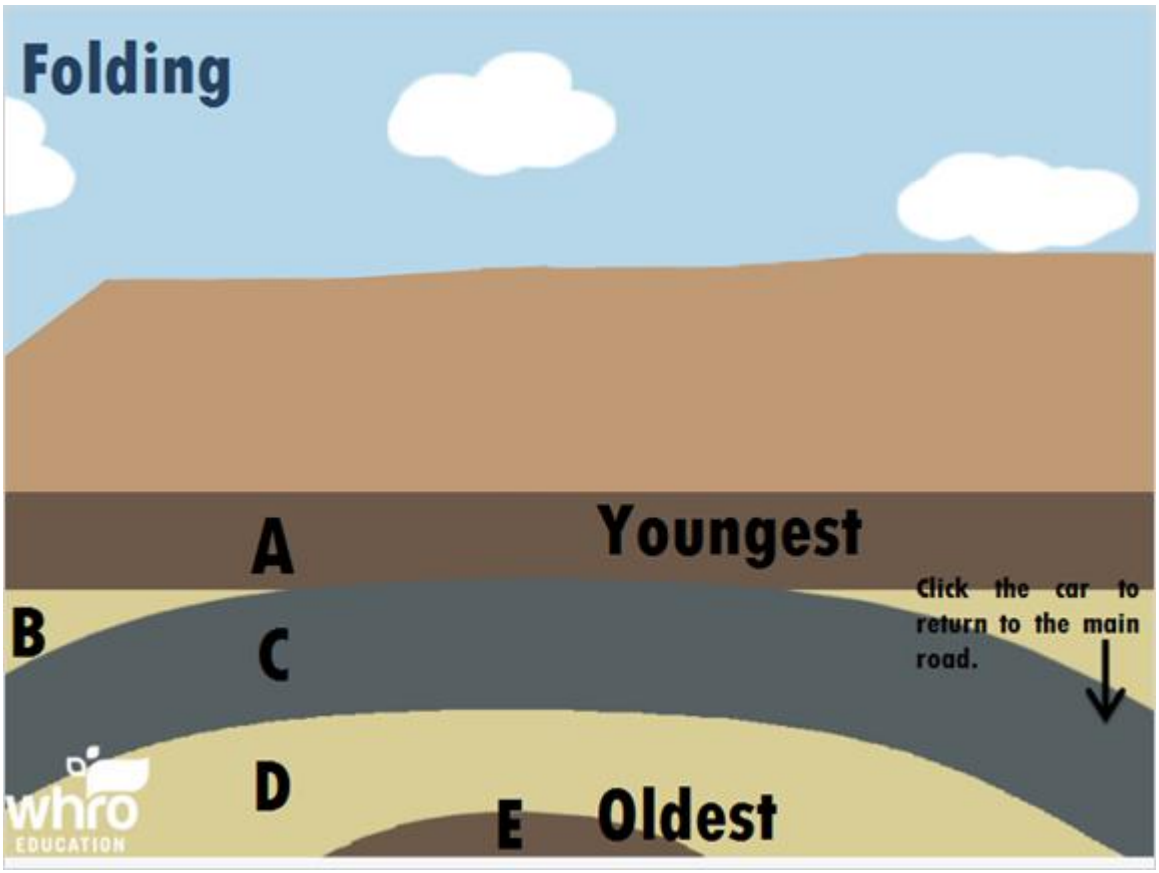
One of the easiest ways to view Virginia's rock history is to take a field trip through a mountainous area. In order to build roads in the mountains, engineers have to cut through the mountains. These road cuts, or outcrops, provide an excellent view of the geologic history of an area. Geologists use the process of relative dating to provide an approximate age to each of the rock layers in a sequence. Basically, relative dating is a method of assigning ages to rock without using numbers or other finite values. In this interactivity, you will travel to different rock outcrops and learn how to apply a relative age to each rock layer in the sequence. To get started, drag the car and drop it on the outlined area for each outcrop. Make sure to visit each of the different outcrops on this mountain.



Looking at this outcrop, you can see that there are four different layers of sedimentary rock displayed as different colors. You know these are sedimentary rocks because they are deposited horizontally. If the rocks were labeled A, B, C, and D, how could you apply a relative age to this outcrop? You must use the Principle of Superposition. This geologic principle states that in undisturbed layers of rock, the oldest layers are found at the bottom of the sequence and the youngest layers are found at the top of the sequence. In this particular outcrop, Layer A is the youngest and layer D is the oldest. Click the car to return to the main road and continue your field trip through the mountains.



Observing faults in rock layers is fairly common. You may think that faults only exist in areas that are prone to earthquakes, or areas where tectonic plates interact. Faults are found anywhere that current or ancient geologic forces have put rocks under stress. As your car pulls up to this rock outcrop, you can see that the rock layers appear split by a diagonal line. The diagonal line that separates the rock layers is actually a fault line. It appears as though the layers have shifted in relation to one another. This shifting took place as the fault moved. Applying a relative age is more difficult than just using the Principle of Superposition. In order to apply a relative age to this rock outcrop, you must use the Principle of Cross-Cutting Relationships. According to this principle, any geologic feature that cuts through another geologic feature is younger than the feature through which it is cutting. Other than faults, igneous intrusions also cut through sedimentary rock layers. In this outcrop, the fault cuts through all of the rock layers. This makes the fault the most recent geologic event. Click the car to return to the main road and continue your field trip through the mountains.



Pulling up to this rock outcrop, it appears that the rocks are bent, or folded. Folding occurs when rocks bend into wavy patterns in response to the force of compression. Imagine how strong the forces beneath the surface must be to cause rock layers to bend in this fashion. While folding does bend the rock layers, it does not generally change the order of the rocks in the sequence. You can see that Layer A is the most recent rock layer to form and Layer E is the oldest rock layer. Click the car to return to the main road and continue your field trip through the mountains.