

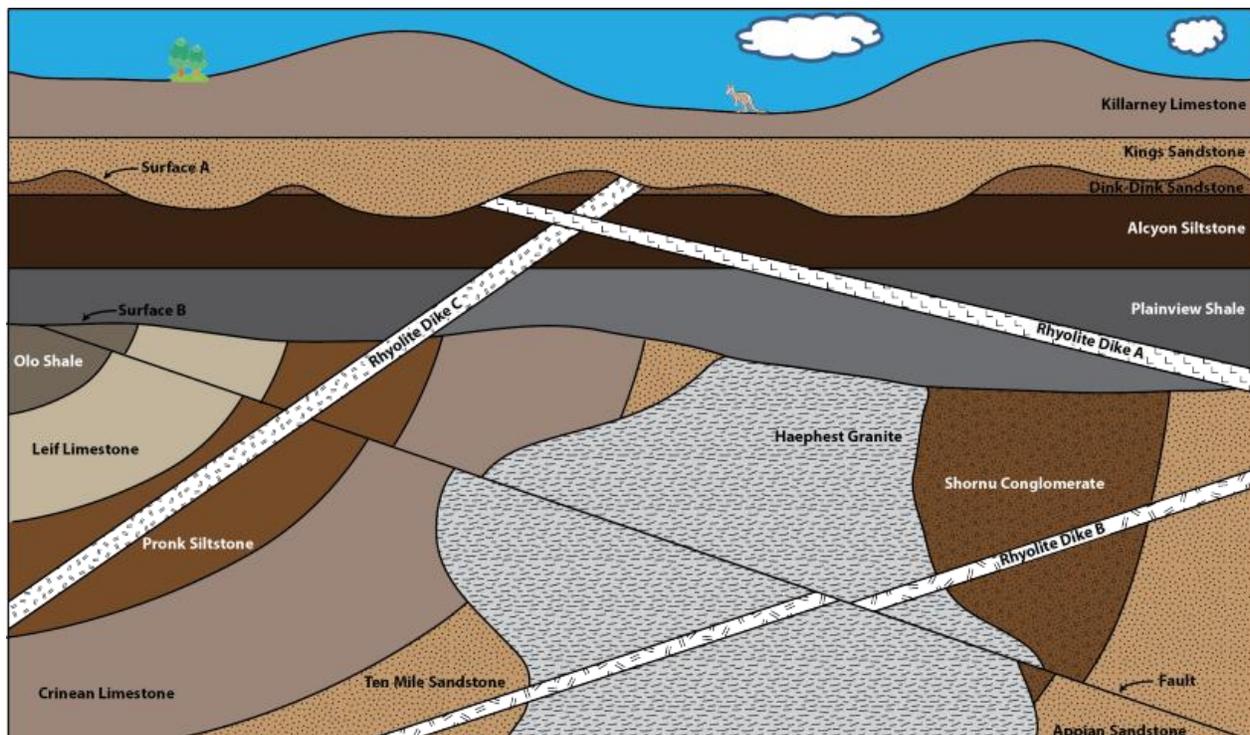
## Mars for Earthlings

**LESSON 11: Age & Times of Mars vs. Earth****Homework 1**

Age &amp; Times of Mars vs. Earth\_MFE

*It's All Relative*

**Objective:** Apply relative dating laws to interpret block diagrams, Earth road cuts, and Mars imagery.



**Figure 1** Block diagram. Source: <http://fractalplanet.wordpress.com/2013/02/11/relative-dating-activity/>

1. How many unconformities (erosional breaks) are present in the image? Name each kind and explain your reasoning.
2. What law did you use to determine the relative ages of the Ten Mile Sandstone and Appian Sandstone?

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3. List the order of geologic events by name from *oldest to youngest* below (i.e. Surface A, Rhyolite Dike C, Ten Mile Sandstone etc.):

### Road Cuts on Earth

Navigate to the website: <http://www.gigapan.com/gigapans/104247> to view the Moab Fault Zone in Utah.

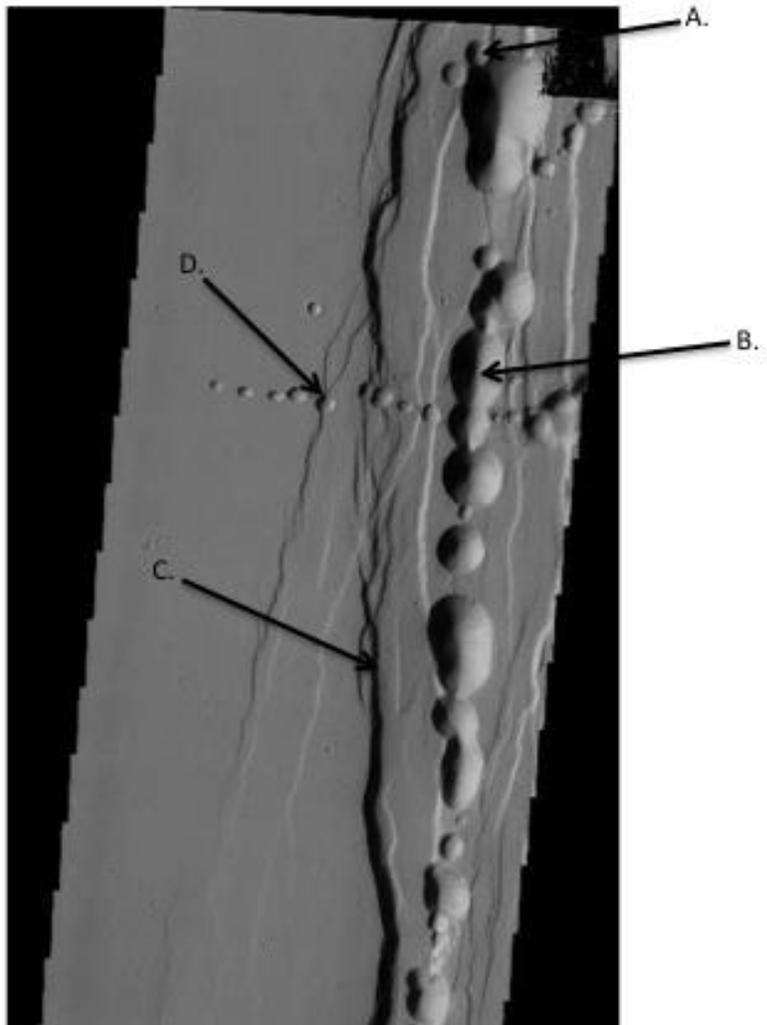
4. How many faults do you observe?
5. How many geologic units do you see? What criteria are you using to differentiate your geologic units?
6. What principle of relative dating is most useful for interpreting this image?
7. Are there any unconformities? If so, how many and what type?



## Mars for Earthlings

**Tractus Catena on the south of Alba Mons**

Below (Figure 2) is an image taken by THEMIS of a fracture zone on Mars. Observe the image and answer the following questions:



**Figure 2** Tractus Catena on the south of Alba Mons, Mars. Themis image; Image Credit: NASA/JPL/ASU. Source: <http://themis.asu.edu/node/5918>

8. Order the geologic events (A-D) from *oldest to youngest*. Make sure you note the entire image as you make your decisions.

9. What makes this image difficult to interpret?

10. What law(s)/principles of relative dating did you use to interpret the image?

11. If you are already familiar with tectonics, are features B and D likely related to extension or compression? Justify your answer.