

## Mars for Earthlings

**LESSON 9: The Active Interior and Crustal Change****Homework 1**

The Active Interior and Valles Marineris

*Valles Marineris vs. The Grand Canyon***Preparation**

- Have access to Google Earth and Google Mars

**Comparing dimensions**

Using Google Earth and Google Mars, compare the length of Valles Marineris (VM) to the Grand Canyon (GC) using the ruler tool [button with a ruler on it in top task bar].

1. Valles Marineris (take the longest axis measurement you can) \_\_\_\_\_ mi
2. The Grand Canyon (start: Marble Falls, AZ; end: beginning of Lake Mead) \_\_\_\_\_ mi
3. How do their lengths compare? Find a comparable landmass on Earth that would be close to the length of Valles Marineris.

**Depth of the Canyons**

Using Google Mars, find Candor Chasma and make sure the colorized terrain map (layer in Global Maps) is visible.

4. What is the diameter of Candor Chasma (click on the dot/name)? \_\_\_\_\_ mi
5. Is Candor Chasma longer or shorter than the Grand Canyon?
6. How deep is Candor Chasma (use the colorized terrain map and/or ruler tool)? Take 3 measurements trying to find the deepest points. Provide the average.
  - a. \_\_\_\_\_ mi
  - b. \_\_\_\_\_ mi
  - c. \_\_\_\_\_ mi
  - d. \_\_\_\_\_ average mi



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7. Just west of Candor Chasma (orient N to be North) is a HiRISE image ESP\_014286\_1735. Go to the observation information page to view the image in greater detail. What kind of faults might be forming the ridges? Give your reasoning. (Hint: Basin and Range Province of the United States)
  
8. Sketch an image of how the fault you named in #7 works (Show the hanging wall and foot wall with relative motion. For help determining hanging wall and foot wall see: <http://www.opensha.org/glossary-hangingFootWall>):

Go back to Google Earth and find the Grand Canyon

9. How deep is the Grand Canyon? Take 3 measurements trying to find the deepest points. Provide the average. Use the ruler tool (you may need to adjust your viewpoint in Google Earth to see depth).
  - a. \_\_\_\_\_ mi
  - b. \_\_\_\_\_ mi
  - c. \_\_\_\_\_ mi
  - d. \_\_\_\_\_ average mi
  
10. Can you observe any evidence of faulting in the Grand Canyon (spend some time viewing the entire canyon in Google Earth)? If so, what do you observe?
  
  
  
  
  
  
  
  
  
  
11. Which canyon is deeper? Provide at least 2 reasons for why one canyon might be longer and deeper than the other.

