**Compare the Topography of Earth and Mars**

**Student Handout**

**Step 1: Tour of the solar system**

Answer the following questions:

1. Identify the eight planets in the solar system. Begin with the planet closets to the sun and sun and list them in order, from closest to farthest away. Briefly describe what the surface of this planet looks like. Is it smooth or rough, clear or cloudy, dark or light for example? What color is it? Does it have moons, rings, or other features?

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1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Which planets form the inner solar system?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which ones form the outer solar system?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Which planet is the largest?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Name two dwarf planets.

1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 2: Tour of the Earth’s surface**

Answer the following questions:

1. How much of Earth’s surface is water?\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. How much of Earth’s surface is land? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What is another name for planet Earth?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Identify each of Earth’s five oceans:

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3,\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Which ocean is the largest?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which ocean is the smallest?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What is the difference between an ocean and a sea?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Identify by name the north and south poles of Earth.

North pole:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

South pole:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Which pole contains the largest ice cap?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. If the largest pole were to melt, how high do scientists estimate the sea level will rise? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What percentage of the Earth’s fresh water supply is in the two polar ice caps together?
4. Name the seven continents and list one surface feature or topographical feature (like a high mountain or long river) of each:

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Where is the Grand Canyon located?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. How was it formed?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. How long and deep is it?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 3: Tour of the surface of Mars**

Answer the following questions:

1. Why is Mars called The Red Planet? What is present on its surface that gives it this color? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Are there any continents on Mars? If so, name them.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Are there any oceans? IF so, name them.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. How is the surface of the northern half of Mars different from its southern half?
5. What surface or topographic feature is most common on Mars?\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Name the highest mountain on Mars and compare its height to that of the highest mountain on Earth.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. List the topographic features of Mars that can also be found on Earth:\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What are Mars’s polar ice caps made of?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Do these ice caps change? If so, how?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What is the name of the Grand Canyon of Mars?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Compare its size to Earth’s Grand Canyon.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 4: Visit and research one topographical feature of both Earth and Mars**

**Software:** Microsoft WorldWide Telescope, Microsoft Internet Explorer

**What to do:** Research one surface feature of Earth and Mars

1. Open WWT. In the bottom left corner, under Look At, click the arrow and on the menu click **Planet**. Under Imagery, click **Mars**. Zoom closer by using the mouse wheel, and then explore the planet’s surface by rotating and tilting it. To rotate and tilt, hold down the left mouse button while dragging the pointer.
2. Select one topographical feature to explore in depth, for example: a mountain, a desert, ice caps, or craters. You may want to use Inter net Explorer to help you find a distinctive topographical feature.
3. Once you have selected a topographic feature, use Internet Explorer to research the site. Take good notes and be sure to include digital images that illustrate your points.
4. Open WWT. In bottom left corner, under Look At, click the arrow and on the menu click **Planet**. Under Imagery, click **Earth**. Zoom closer by using the mouse wheel, and then explore the planet’s surface by rotating and tilting it. To rotate and tilt, hold down the left mouse button while dragging the pointer. Look for a topographical feature comparable to the one you researched on the Mars’s surface. For example, if you researched a mountain on Mars, research a mountain on Earth; if you researched one of Mars’s craters, research a crater or crater lake on Earth; if you explored the desert on Mars, research a desert on earth. (Scientists are now finding similarities between the Mars desert and the desert in Chile!)
5. Once you have selected a topographic feature, use Internet Explorer to research the site. Take good notes on the site. Take good notes and be sure to include digital images that illustrate your points.
6. Compare the two sites. In what ways are they similar and in what ways do they differ? What conclusions can you draw about the topography of Earth and Mars?

**Step 5: Create an Office PowerPoint comparing the topography of Earth and Mars.**

**Software:** Microsoft Office PowerPoint

**What to do:** Create a PowerPoint of your research

1. Open Microsoft Office PowerPoint. Create a title slide for your presentation.
2. Organize the material you collected in your research. You may want to start with the feature of Mars and then move to the site on Earth or vice versa. Or, you may want to alternate slides of Mars and Earth, making comparisons along the way.
3. As you make individual slides, be sure to put only the most important information on the slides. You can add additional information in the Notes section below, to guide you as you present your material.
4. Collect any additional digital images you may need and add all the necessary images to your slides.
5. Add a conclusion slide.
6. Format the style and color of your Office PowerPoint so it is legible and attractive.
7. Practice presenting your slides.