

SCIENCE•3D

DESERT MONSTER

In this packet, sample student answers are provided in **red** and notes to teacher are in **blue**.

This **Explore Your Backyard** has multiple activity options. In the first activity, students will create a landform map of an imaginary world. They'll describe how their world was shaped by constructive and destructive processes. In the second activity, students will use online resources to explore satellite maps of their local environment or a location of their choosing. In the third activity, they will create a map of a local area and provide an argument for how different landforms were created.



All environments have constructive processes that build landforms. For instance, volcanoes are a constructive process that form new land from lava. Environments also have destructive processes that wear away landforms. Waves slowly can break rocks (weathering) and carry sediment away (erosion). Moving water can carry soil downstream and cut through the landscape (erosion). Glaciers are large masses of ice that move slowly. They once moved across large areas, like Ohio and New York. Then, they retreated north as the climate warmed. Glaciers flatten hills and fill valleys with rocks, making the land flatter. Sometimes they leave large grooves in the rock they flow over. Large hills, steep ridges, and valleys are in areas where glaciers didn't move. Rock arches can form when wind and water slowly wear away rock. Table 1 shows some landforms that are created by constructive processes (like deposition) and destructive processes like weathering and erosion.

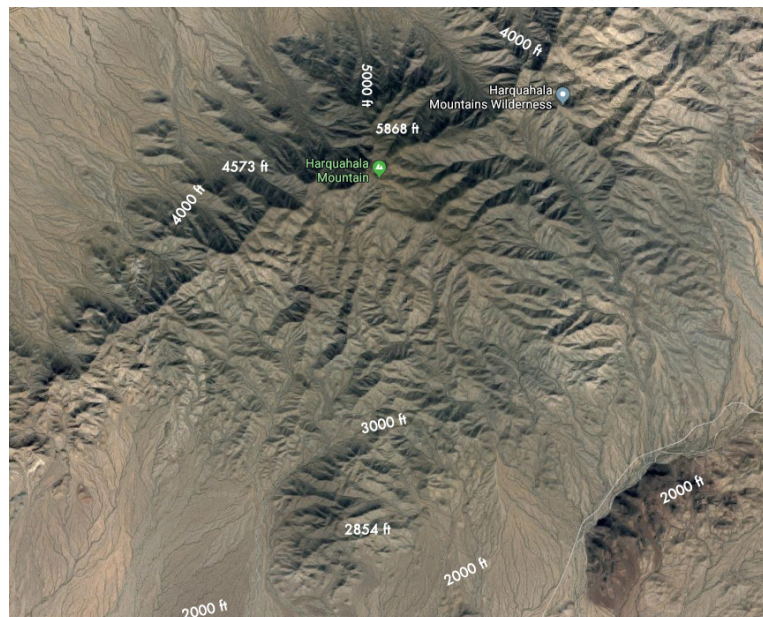
Table 1. Examples of landforms created by constructive and destructive processes

Landforms shaped by destructive processes	Landforms shaped by constructive processes
Canyon	Mountains
River	Sandbars
Rock arches	Volcanoes
Glacial grooves in rock	Islands at the mouth of a river

Activity 1: A New World!

Before starting this activity, have students refresh their understanding of landforms. This can be in the form of a class discussion based on previous knowledge or what they learned from the **Mission Reader** or video. Another option is to have students use books or online resources to learn about some landforms and investigate how they are represented on maps. Once students have researched landforms, have them complete the assignment below. Have students use their imaginations to create a new world or island. Explain that their worlds must be based on processes that happen in the real world. Have students make and present maps or posters.

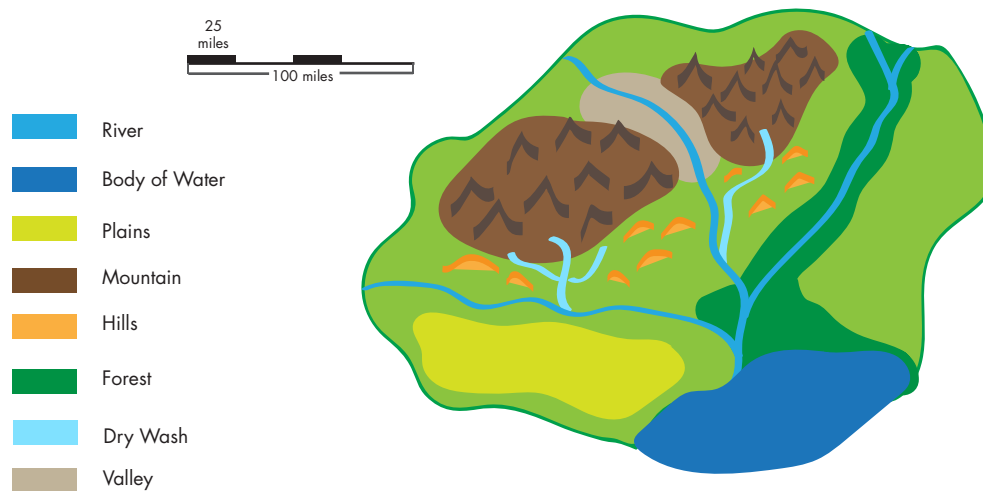
The Sonoran Desert has many different landforms. The mountains are easy to see, but other landforms (like dried up stream beds), are more difficult to spot. These landforms were shaped by different processes.



Your mission is to use your imagination to make a map of a location that doesn't exist. Your map should include:

- at least five different landforms (like mountains and rivers).
- a scale to show the size of the area
- labels to show how each landform was shaped or created.

Here is an example of a landform map:



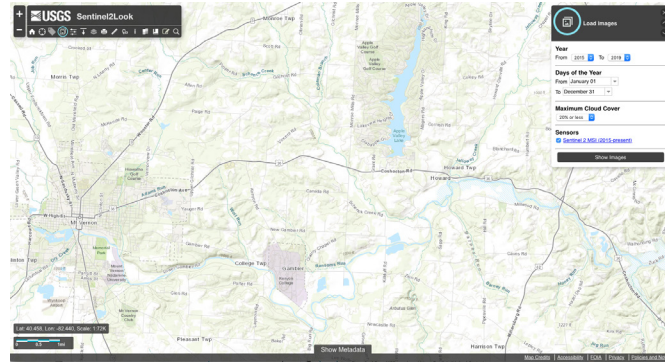
Activity 2: Using Landsat and Topographic Map

In this activity, students will use the United States Geological Survey's Landsat viewer to observe maps of their local environment, or another location. Tell students the location they are going to study. You might suggest, for example, a local area, the Grand Canyon, or a location of students' choice. The Landsat maps provide useful information on landforms. Rivers are colored blue and areas with vegetation like forests and grasslands, are colored green. Elevation is indicated with lines. More information on how Landsat works can be found at <https://landsat.gsfc.nasa.gov/how-landsat-works/>.

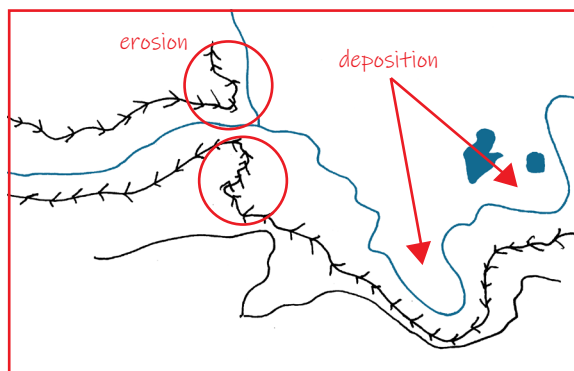
In this activity, you will use an online tool to learn about maps.

Follow these steps:

- Use the internet to go to the site <https://landsatlook.usgs.gov>.
- Click on the middle button near the bottom that says "Start Sentinel2Look Viewer."
- Find the location in the United States that you are going to investigate and double click on it.
- Continue to double click until the scale bar in the lower left corner reaches a scale up to one mile.



1. Use the space below to **recreate** the map that you created online. Be sure to include rivers, lakes, streams, and oceans. Also, **draw** the hills and mountains.
2. On the map you drew, circle landforms that you think were created by **erosion** and draw arrows to point to places where **deposition** might occur.



3. Online, click on the small box labeled "Show Images" in the box on the right side of the screen. This displays images of the areas on the map, collected from satellites. **Compare** and **contrast** these maps. Is one better than the other for all types of information?



Accept reasonable answers. Student answers should indicate that both types of maps show where rivers and other water habitats are found. The first map doesn't show land use or the types of habitats as well as the picture. But the first map shows elevations better than the satellite image.

Extend the lesson (Ohio): Have different groups of students look at different parts of Ohio. Have them investigate at scales of ten miles down to one mile. Have each group take notes on how flat or hilly their area is and how many rivers they see. Once groups have gathered their data, have them discuss similarities and differences between the different parts of Ohio. Use this discussion to talk about how glaciers shaped the state. Have students use the information in the first paragraph to try to recreate and model areas of Ohio with and without glaciers.

Activity 3: Creating a Map of the Real World

Take students outside to create a map of their own habitats. Local nature reserves and nature parks are ideal locations. Have them studying, take notes, and draw the landforms in the area. After their observations are complete, have each student draw a map of the area independently. Finally, have students work in pairs or groups to compare their maps.

1. **Draw** a map of your location. Label the different landforms. Circle landforms or features of your map that were shaped by water.
2. **Compare** and **contrast** your map with another student's map. How could you make the maps more realistic?

Answers are likely to include that there are differences in the scale at which different objects are represented. Most maps will include fairly similar landforms and locations. Students might suggest that tools that help them measure distances or sizes of landforms would help them make their maps more realistic.

3. **Describe** how the places you circled on your map are influenced by water.