

For Creative Minds

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Earth Movers

It takes a lot of force to create a landform. There are only a few things on earth strong enough to do it! Weather, water, wind, cooling magma, and massive earth movements can each create different landforms.



Weathering landforms are formed when the rocks on the earth's surface undergo physical or chemical changes. Weathering may be caused by things like heat, cold, frost, humidity, chemical changes within the rock, and the release of gases in the soil. This process breaks down rocks and minerals into smaller pieces. They remain in place until another process carries them away. Over time, weathering creates new landforms.

Water is a powerful force. When water moves across the land, it will not only wear down the rocks, it can also carry away the pieces. This process is called "erosion." **Erosional landforms** are left behind when water erodes the land and moves the eroded rock away. Wind is another powerful natural force that can cause erosion on the earth's surface.

After water carries the eroded soil and rock away from one place, the material is put down, or deposited, somewhere else. **Depositional landforms** are formed when water carries material into a new area and leaves it there.

The earth is a sphere made up of four layers, including the crust (where we live), the mantle, the outer core and the inner core. Tectonic plates make up the thin outer layer of the earth's crust, just like the skin of an apple. Plates can pull apart, move closer together, or shift against each other. This creates friction and causes earthquakes. Sometimes the plates collide and force the land to "crumple" and rise up, forming mountain ranges. **Structural landforms**, like mountains, are made by the movement of the earth's plates.

Landform Sorting

Landforms can be sorted based on how they are formed. Read about the formation of these different landforms to determine if they are weathering landscapes, erosional landscapes, depositional landscapes, or structural landscapes.



This **beach** is made of sand. Pieces of rock were broken down and carried to the shore by rivers and streams, or ocean waves. The sand was deposited along the coast to make a beach.



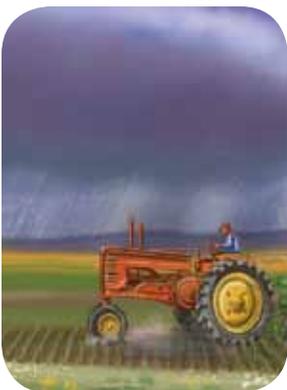
More than 35 million years ago, this was a flat plain. The Colorado River flowed through, eroding the rock. Today the Grand Canyon, shaped by this erosion, is one of the largest **canyons** in the world.



A **mesa** is a type of small plateau. This area was once a level plain or hill. Weathering agents in the atmosphere broke down the soft soil. This left only the flat surface of the rock, high above the surrounding land.



This **mountain range** was formed between two of the earth's plates. As the plates pushed together, the ground rose. This process can take millions of years.



Before there was a **plain** here, there may have been a lake or a glacier. The water brought soil from different places and deposited it here. Many farmers like plains because they have flat ground and rich soil.



This **valley** was made by the river that flows through it. As the water eroded the land, the ground was cut down and the pieces were carried away.

Landform Matching



Match the pictures of landforms from around the world with their names and descriptions.

1. A mountain is a large, rocky peak that stretches up above the surrounding land.
2. A coast is the area where land and ocean meet.
3. An archipelago is made of multiple islands in a chain or row.
4. A volcano is a vent in the earth through which lava and hot vapor can erupt.

Answers: 1-D, 2-B, 3-A, 4-C.

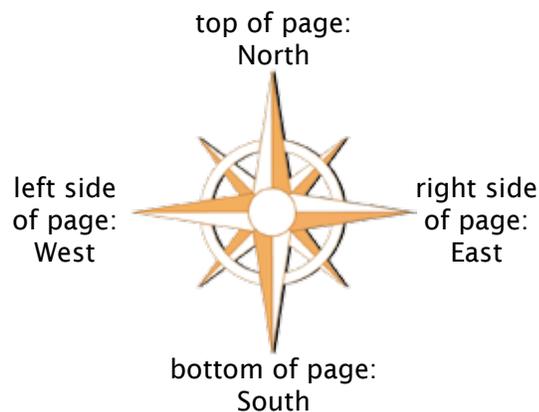
Map Skills

The largest landform is a continent. There are seven continents. A world map shows where the continents are in relation to one another and to the world's oceans.

A compass rose shows directions on a map. Usually maps show the top of the page as north. South is always the opposite of north, so south would be on the bottom of the page. If you look north, east is the direction to your right and west is on your left. You can use these directions to describe where things are in relation to each other.

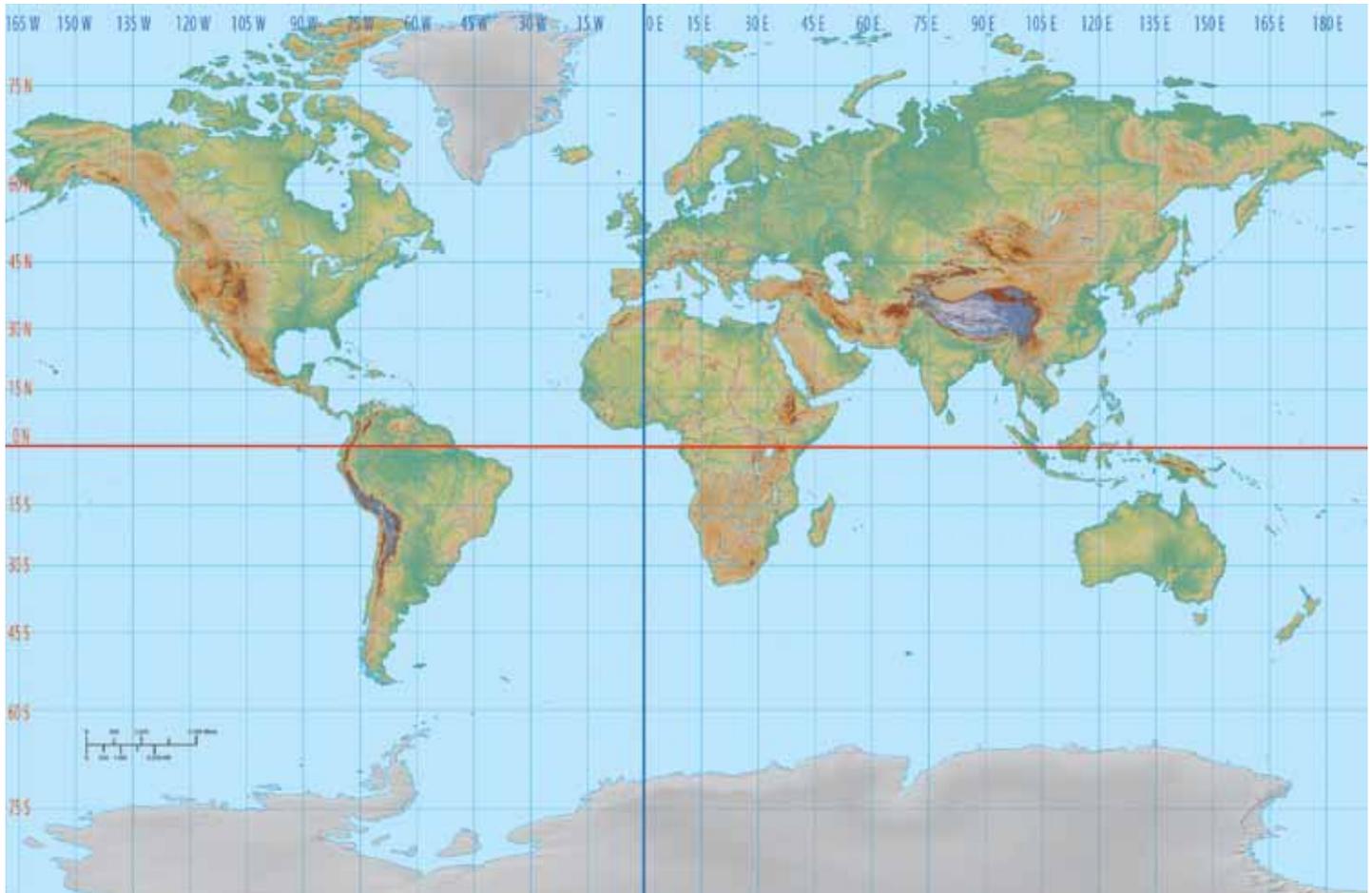
Look at the map on the next page to answer these questions. Answers are below.

1. What ocean is to the east of North America?
2. What ocean is to the west of South America?
3. What continent is to the north of Africa?
4. What continent is to the north of the Indian Ocean?
5. What ocean is to the west of Australia?



Answers: 1-Atlantic Ocean, 2-Pacific Ocean, 3-Europe, 4-Asia, 5-Indian Ocean.

A **grid** can help you find a specific location on a map. Any place in the world can be identified using a special grid made of imaginary lines. The **equator** is an imaginary line that runs around the center of the earth. On the world map below, the equator is shown as a red line. The **prime meridian** is an imaginary line that runs from the North Pole to the South Pole. The prime meridian is shown here in blue.



Every place on earth can be identified by its distance north or south of the equator (latitude) and its distance east or west of the prime meridian (longitude). These distances are measured in degrees (°). The world map above shows these degrees, skip-counting by 15.

If you wanted to know what ocean is found at 0° N, 0°E, you should first find the latitude line 0° north. This is the equator. Follow the equator line until it intersects with the longitude line for 0° east—the prime meridian. Once you have found this point, you can see that it is in the Atlantic Ocean.

Use the world map to answer the following questions:

1. If you were standing at 15°S, 60°W, what continent would you be on?
2. If you took a boat and sailed to 45°N, 15°W, what ocean would you be in?
3. If you traveled by dog-sled to 75°S, 105°E, what continent would you be on?
4. Is North America north or south of the equator?
5. Is Australia east or west of the prime meridian?