

A Rising Tide of Interest

What causes tides?

Active Reading

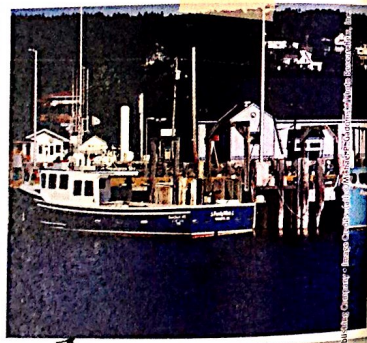
5 Identify Underline the sentence that identifies which object is mainly responsible for tides on Earth.

The two photographs below show the tides at the same location at two different times. **Tides** are daily changes in the level of ocean water. Tides are caused by the difference in the gravitational force of the sun and the moon across Earth. This difference in gravitational force is called the *tidal force*. The tidal force exerted by the moon is stronger than the tidal force exerted by the sun because the moon is much closer to Earth than the sun is. So, the moon is mainly responsible for tides on Earth.

The moon's gravitational pull on Earth decreases with the moon's distance from Earth. The part of Earth facing the moon is pulled toward the moon with the greatest force. So, water on that side of Earth bulges toward the moon. The center of Earth is farther from the moon than the part of Earth facing the moon. So, the center of Earth is not pulled as strongly as the part facing the moon. Earth's far side is pulled even less than the center of Earth. The differences in the moon's gravitational pull on different parts of Earth result in a slight stretching of Earth and the oceans along an imaginary line connecting Earth and the moon. The result is a bulge of water on both the near side and far side of Earth.



At low tide, the water level is low, and the boats are far below the dock.



At high tide, the water level has risen, and the boats are close to the dock.

What are high tides and low tides?

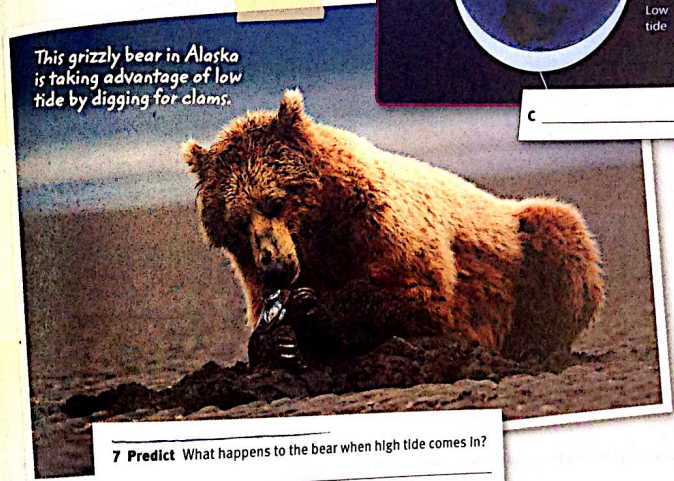
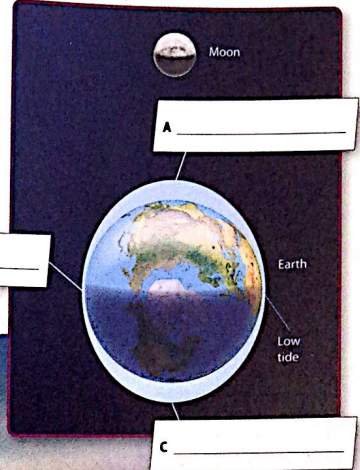
The bulges that form in Earth's oceans are called high tides. *High tide* is a water level that is higher than the average sea level. Low tides form in the areas between the high tides. *Low tide* is a water level that is lower than the average sea level. At low tide, the water levels are lower because the water is in high-tide areas.

As the moon moves around Earth and Earth rotates, the tidal bulges move around Earth. The tidal bulges follow the motion of the moon. As a result, many places on Earth have two high tides and two low tides each day.

Visualize It!

6 Identify Label the areas where high tides form and the area where the other low tide forms.

Note: Drawing is not to scale.



7 Predict What happens to the bear when high tide comes in?