



FIGURE 15

High and Low Tides

In some locations, such as along this beach in Australia, there can be dramatic differences between the height of high and low tides.

Tides

Have you ever built a sand castle on an ocean beach? Was it washed away by rising water? This is an example of tides, the rise and fall of ocean water that occurs every 12.5 hours or so. The water rises for about six hours, then falls for about six hours, in a regular cycle.

The force of gravity pulls the moon and Earth (including the water on Earth's surface) toward each other. Tides are caused mainly by differences in how much the moon's gravity pulls on different parts of Earth.

The Tide Cycle Look at Figure 16. The force of the moon's gravity at point A, which is closer to the moon, is stronger than the force of the moon's gravity on Earth as a whole. The water flows toward point A, and a high tide forms.

The force of the moon's gravity at point C, which is on the far side of Earth from the moon, is weaker than the force of the moon's gravity on Earth as a whole. Earth is pulled toward the moon more strongly than the water at point C, so the water is "left behind." Water flows toward point C, and a high tide occurs there too. Between points A and C, water flows away from points B and D, causing low tides.

At any one time there are two places with high tides and two places with low tides on Earth. As Earth rotates, one high tide stays on the side of Earth facing the moon. The second high tide stays on the opposite side of Earth. Each location on Earth sweeps through those two high tides and two low tides every 25 hours or so.

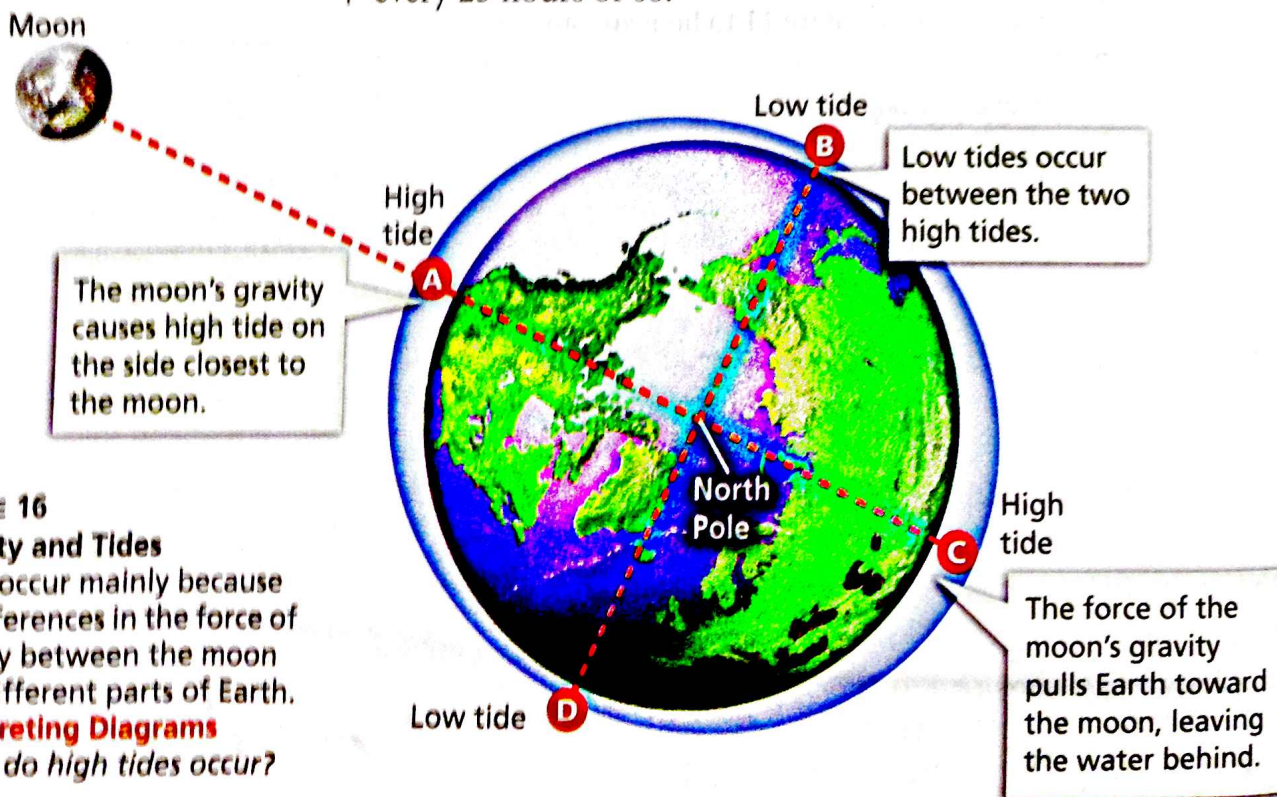


FIGURE 16

Gravity and Tides

Tides occur mainly because of differences in the force of gravity between the moon and different parts of Earth.

Interpreting Diagrams

When do high tides occur?