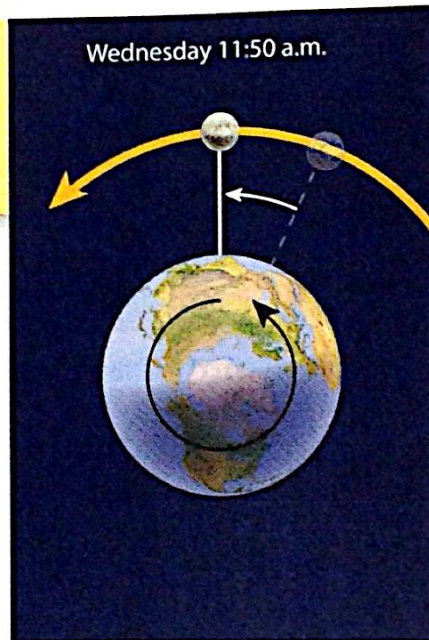
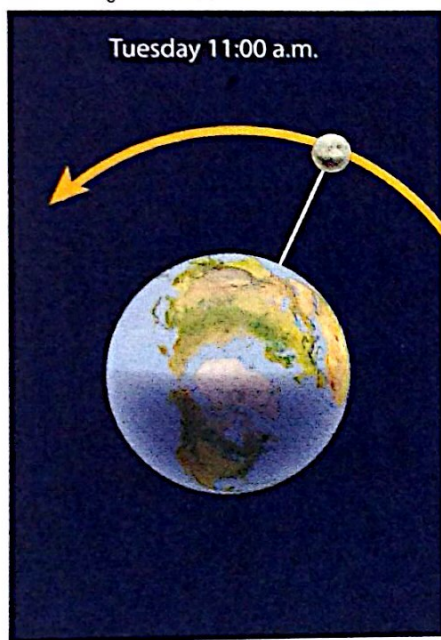


What causes tidal cycles?

The rotation of Earth and the moon's revolution around Earth determine when tides occur. Imagine that Earth rotated at the same speed that the moon revolves around Earth. If this were true, the same side of Earth would always face the moon. And high tide would always be at the same places on Earth. But the moon revolves around Earth much more slowly than Earth rotates. A place on Earth that is facing the moon takes 24 h and 50 min to rotate to face the moon again. So, the cycle of high tides and low tides at that place happens 50 min later each day.

In many places there are two high tides and two low tides each day. Because the tide cycle occurs in 24 h and 50 min intervals, it takes about 6 h and 12.5 min (one-fourth the time of the total cycle) for water in an area to go from high tide to low tide. It takes about 12 h and 25 min (one-half the time of the total cycle) to go from one high tide to the next high tide.

Note: Drawings are not to scale.



The moon moves only a fraction of its orbit in the time that Earth rotates once.

Think Outside the Book Inquiry

11 Inquire Draw a diagram of Earth to show what Earth's tides would be like if the moon revolved around Earth at the same speed that Earth rotates.

12 Predict In the table, predict the approximate times of high tide and low tide for Clearwater, Florida.

Tide Data for Clearwater, Florida

Date (2009)	High tide	Low tide	High tide	Low tide
August 19	12:14 a.m.		12:39 p.m.	
August 20	1:04 a.m.	7:17 a.m.		
August 21				