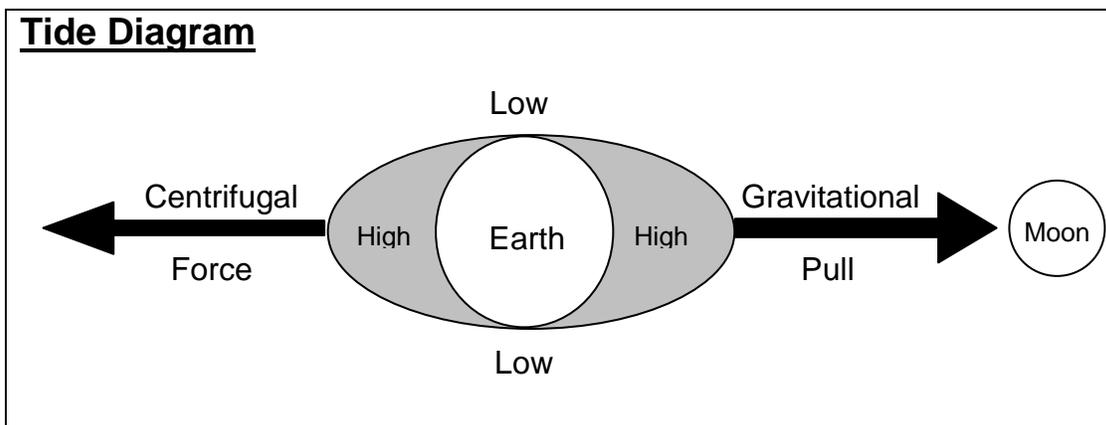


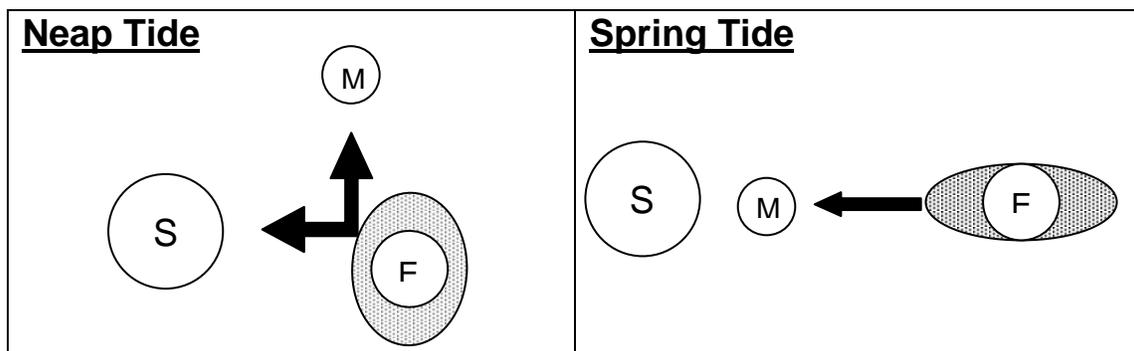
# Tide Facts

## What are tides?

Tides are the periodic rise and fall of the oceans. They are caused by the gravitational pull of the moon (and to a lesser extent the sun). Tides are also influenced by the centrifugal force created by the rotation of the earth. The moon's gravity pulls water away from the earth's surface. This causes the water to rise, forming a high tide. Because of this, the part of earth closest to the moon usually has the highest tides. On the opposite side of earth (away from the moon), the centrifugal force also pulls the water away from the earth's surface. This causes another high tide. Low tides occur because most of the ocean's water is pulled into these high tide areas. Can you find the high and low tides in the diagram below?



Neap tides occur during a quarter or three-quarter moon when the earth, sun, and moon form a right angle. During these mid-range tides, high tides are not very high and low tides are not very low. This is because the sun and moon are pulling the earth's water in two different directions. Spring tides occur during a full or new moon when the earth, sun, and moon are aligned. This is when the highest high tides and the lowest low tides occur. These extreme highs and lows occur because the gravities of the sun and moon work together, pulling in the same direction.



### Can tides be predicted?

Yes, tides are easily observed and predicted. Scientists use a mathematical formula to predict the earth's tidal schedules. They use the lunar day, which is 24 hours and 50 minutes long. Scientists use a lunar day because the moon (luna) is the strongest influence on the earth's tides. These extra 50 minutes cause tides to be at different times each day.

### How are tides reported?

The length of time between high and low tides is called the tidal period. This information is recorded in tide tables. Tide tables list the location, the date, the times of high and low tides, and the elevation of the water. Some tide tables also show the times of the sunrise, sunset, moonrise, and moonset. Every body of water, port, and harbor has its own tide table. Use the sample tide table below to find the times for the high tides on Oct. 15.

#### LOCATION: PELOTES ISLAND

Date	High/ Low	Tide Time	Height (ft.)	Sunrise Sunset	Moonset Moonrise	% Moon Visible
Oct. 14	Low	4:09 am	0.2	7:28 am	8:34 am 8:11 pm	99
	High	10:27 am	4.7	6:56 pm		
	Low	4:39 pm	0.3			
	High	10:48 pm	4.3			
Oct. 15	Low	4:49 am	0.2	7:29 am	9:36 am 8:52 pm	96
	High	11:09 am	4.7	6:55 pm		
	Low	5:24 pm	0.4			
	High	11:31 pm	4.2			
Oct. 16	Low	5:31 am	0.2	7:29 am	10:40 am 9:37 pm	91
	High	11:55 am	4.7	6:54 pm		
	Low	6:13 pm	0.5			

Answer: 11:09 am and 11:31 pm

### Are tides the same everywhere on earth?

No, the number and height of tides on earth varies from location to location. This has two main causes. First, the earth is tilted at a 45-degree angle on its axis. Because of this the moon's gravitational pull is not the same at all locations. Second, the earth's surface is not flat. Mountains and valleys on the ocean floors can slow the movement of tidal water. On the Atlantic coast of Florida there are 4 tidal changes each day, 2 highs and 2 lows. This is called "semidiurnal" or "semidaily". Places along the Gulf coast of Florida have only 2 tides each day, 1 high and 1 low. This is called "diurnal" or "daily tides". It occurs because water must make the long trip around the Florida peninsula to enter and leave the Gulf of Mexico.