

The Tides : Notes/W.S.-150

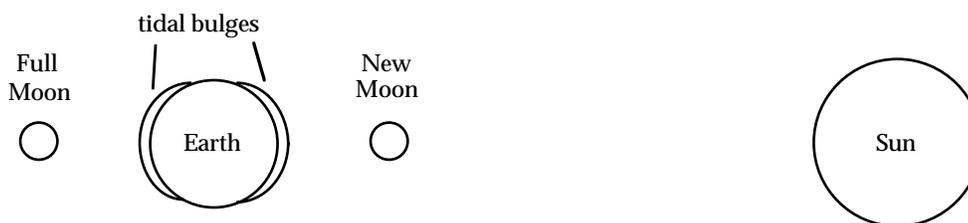
At ocean shores all over the world, the ocean's surface is observed to rise and fall twice per day. This phenomenon is called the **tides**. The tides are caused by the force of gravity of the Moon and the Sun acting on the Earth's oceans. It turns out that the effect of the Sun on the oceans is about half that of the Moon.



There are two tidal bulges as shown in the diagram above. This means that as the earth rotates, there will be two tides every 24 hours. One of the bulges is closest to the Moon. The other bulge is on the opposite side of the Earth. The force of gravity on the ocean closest to the Moon is a little bigger than that on the solid earth below. So the ocean is pulled upward. On the other side of the earth, the moon's force on the ocean is less than that on the solid earth below. So the solid earth is pulled away from the ocean, making the ocean rise.

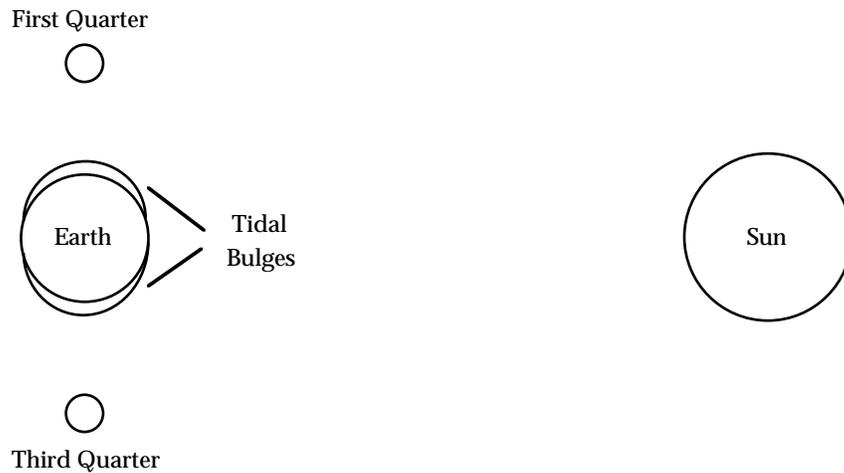
The Sun also affects the tides. At the new moon and the full moon, the tides are called **spring tides**. These are the highest tides, because the Sun, Earth and Moon are in a line so that the gravitational effect on the oceans is at a maximum.

Spring Tides



The tides aren't as extreme during the first and third quarters, because the Sun, Earth and Moon are not in line. These tides are called **neap tides**.

Neap Tides



Questions:

- 1) What are the tides?
- 2) What is the cause of the tides?
- 3) How many tides are there per day?
- 4) When do spring tides occur?
- 5) Why are the spring tides so high?
- 6) When do neap tides occur?

Answers: 1) The tides are the rise and fall of the ocean's surface., 2) The tides are caused by the force of gravity of both the Moon and the Sun acting on the oceans., 3) Two, 4) The spring tides occur at the new and full moons., 5) The Sun, Earth and Moon are in a straight line, so the gravitational force acting on the oceans are at a maximum., 6) The neap tides occur during the first and third quarter phases of the Moon.