

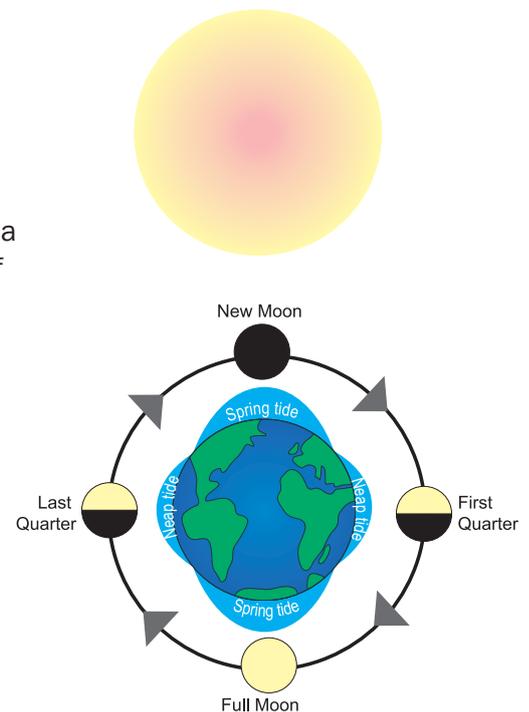
Moon and tides

The rise and fall of the sea is the result of the gravitational attraction of both the **sun** and **moon**. As the moon moves around the earth in an elliptical orbit, its gravitational attraction causes the ocean surface to bulge. As the **earth** spins, it moves through this tidal bulge with its own centrifugal force, resulting in a second bulge appearing on the opposite side of the world. These are the **high tides**, with the **low tides** occurring between the two tidal bulges.

The height of the tides varies with the position of the moon's orbit relative to the sun. When the moon is in line with the sun, **Spring tides** occur, with the largest variation between the highs and lows. **Neap tides** have the smallest difference between high and low tide. Neap tides happen when the moon is in a position 90° to the sun, their opposing forces reducing the difference in the tidal heights of the ocean's surface.

Because of the tilt in the earth's axis and the variations in the shape of ocean basins, tides vary across the planet. In places such as Antarctica, the Mediterranean Sea and the Black Sea, tides are determined not only by the moon's influence, but also by the **wind**. Tides may also vary in their size. On the Great Barrier Reef and Ningaloo Reef, 6-8 m tides are common. The Bay of Fundy in Canada has some of the world's largest tides, reaching up to 18 m. Some of the smallest tides are found in the Caribbean – these can be less than 1 m. Some locations experience only one high and low each day (diurnal tides).

Look up your local tides using WillyWeather (<http://tides.willyweather.com.au/>) for graphical representation or The Bureau of Meteorology website (<http://www.bom.gov.au/australia/tides/>) for tabular information.



Questions

From the data for your closest location, answer the following questions.

1. What time and height in metres is the highest tide today?
2. What time and height in metres is the lowest tide today?
3. How many high tides are there in 1 day (24 hours)?
4. What date and time is the highest tide for the month?
5. What is the name given to the highest tides of the month?
6. Draw a diagram of the location of the sun, moon and earth relative to each other on this day with the highest tide of the month.
7. Explain what a neap tide is?
8. What date is neap tides in your data? Explain why it is neap tide.
9. Draw a diagram of the location of the sun, moon and earth relative to each other on this day with the most neap tides of the month.
10. Your class are planning an excursion to walk around an intertidal zone next month. What days and times are most suitable for your class?