

Watching the Pattern of the Tides

The changes in sea water levels are called **TIDES**.

Tides form a regular pattern of the seas movement. We when watch and understand the pattern the seas follow we can start to understand the forces at work that make it happen.

At the coast, sea levels rise and fall all the time. When we are at the beach this is seen in the waters edge moving higher or lower up the beach throughout the day.

At a harbour or marina, you may be able to see a measurement marker on the wall like a ruler that will show you the height of the water.

Throughout a 24 hr period the tide will rise and fall twice producing :

TWO FULL TIDES
and
TWO LOW TIDES

One pattern leads us to the other.

Seeing the pattern helps us to understand the forces at work.

Q: What are Tides?

A: The vertical motion of sea water

Q: How can water move up and down?

A: With the help of the Moon!

**THE
PULL
OF**



**THE
MOON**

Because the earth is spinning around on its axis the pull of the moon is sometimes stronger or weaker which creates the high or low tides.

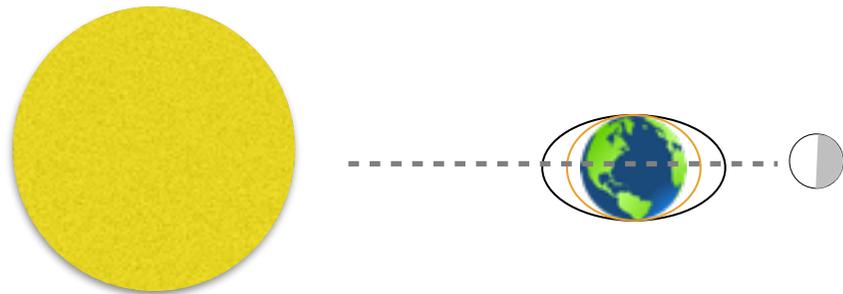
Use the graph and instructions on page 3 and 4 to keep track of tidal heights over a short period of time.

The high of the Full Tides and the low of the Low Tides can vary quite a bit.

The position of the Moon in relation to the Earth and the Sun changes all the time, these changes follow a regular pattern.

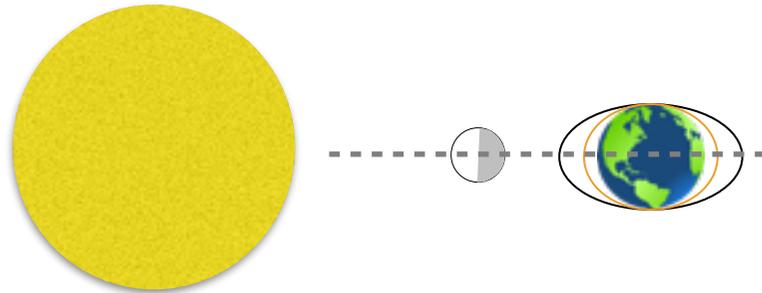
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When we see a Full Moon from the earth, the moon is in this position in relation to the earth and the sun. You can see from the dotted line the direction of 'the Pull of the Moon' is in a straight line.

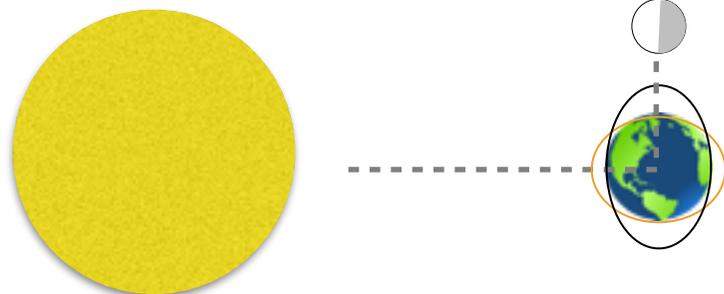
Spring Tides



When it is a New moon, it is between the earth and the sun (it appears black to us) but the direction of 'the Pull of the Moon' is still in a straight line.

The sun has a pull as well as the moon but not as strong.

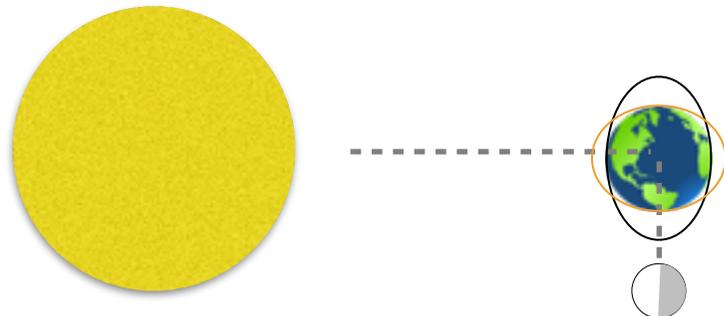
On a Spring Tide this pull from the moon is pulling in the same direction as the sun which means the LUNAR TIDE (black ellipse) and SOLAR TIDE (orange ellipse) are pulling together in the same direction adding their strengths together.



When we see one of the Quarter Moons (First or Third Quarter) it means the moon, earth and sun are not positioned in a straight line meaning less of the pulling force. Its hard to pull around a corner, isn't it?

The pulling force from the moon is not as strong which results in Neap Tides.

Neap Tides



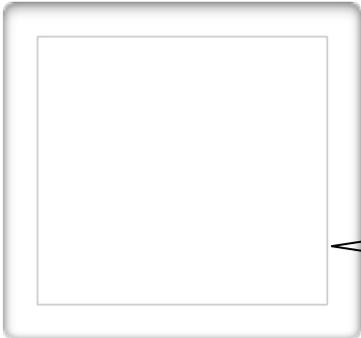
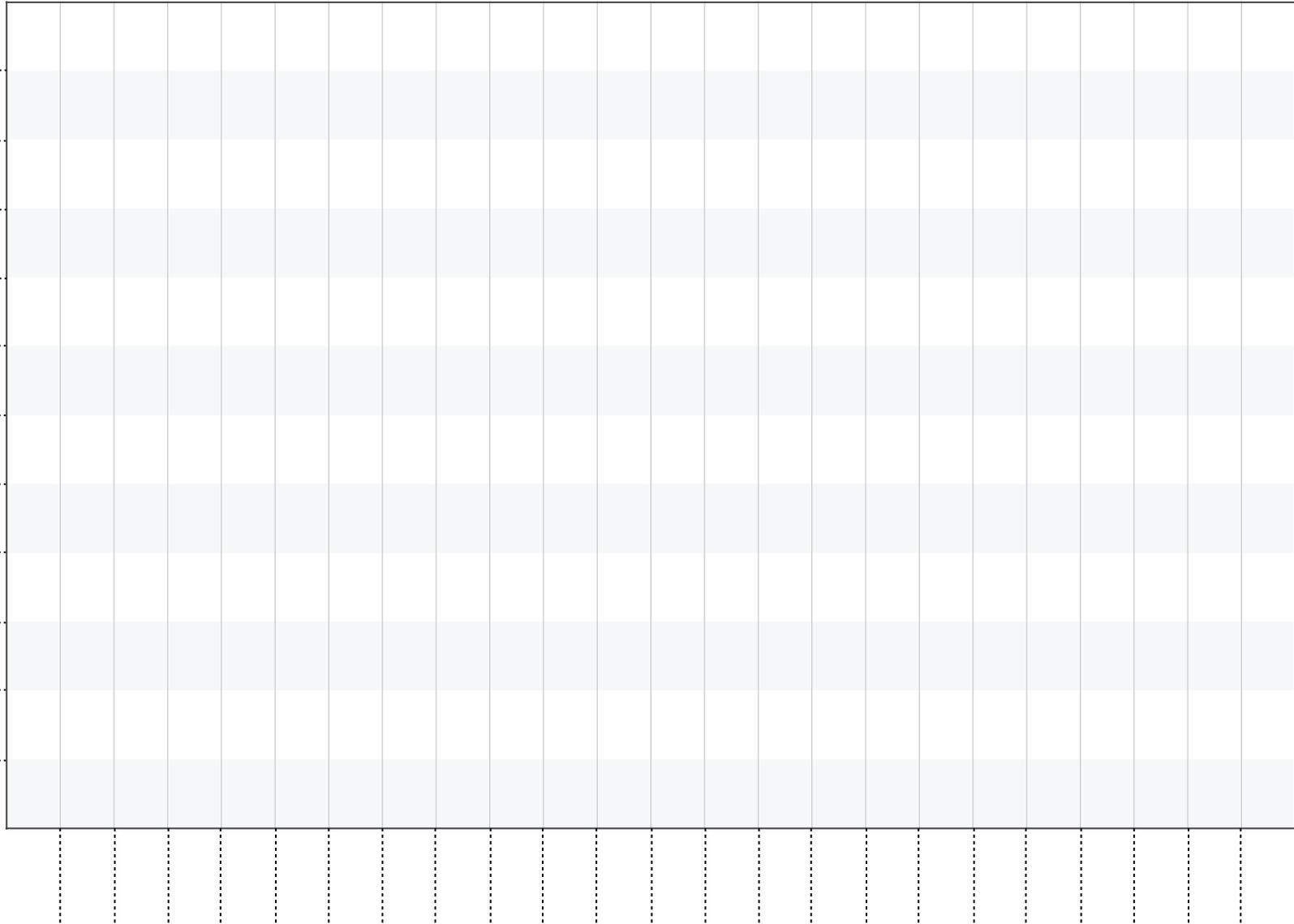
It is this pattern that determines HOW high or low the tides will be. So the pattern that the tide heights make in your graph will match the pattern of the moon in some way.

Tidal Curve Graph

Location Date

Level of water mark in

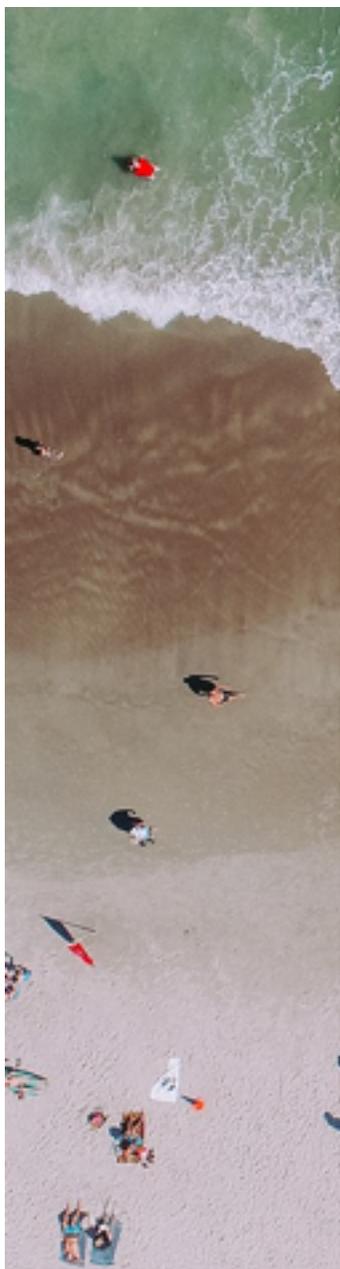
Pick your unit of measurement (eg: paces or metres or inches)



Draw the shape of the moon here

TIME - starting at (enter time of first reading)

Time of readings - each space is one hour. After entering the first reading be sure to space them according to the amount of hours passed



1 Choose your units and height range. These will vary depending on what your location is.

If you are at a port or waterside location that has a measurement marker (which may include negative values) this will be the perfect way to take your readings and insert as data into your graph.

For example: at a beach you could measure in foot paces how far the waterline moves away from your picnic throughout the day.

pace out the amount of sand exposed to collect your readings

2 Throughout the day, write a list of the measurements you take and make sure you write down the times of these readings

3 Using the graph on page 3 and the measurements you have taken, plot it as data onto the graph. Make sure you keep to the correct timeline and use the same unit of measurement.

4 Can you see the moon? if you can draw the shape of it

5 Repeat steps 2 and 3 at the same location in about 10 days time and compare the differences

If you take these recordings over a month long period you will see the regular rhythm of the tide heights and how they increase with the moon phase.

