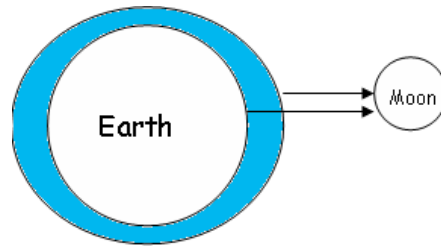


What Causes the Tides?

Reading/discussion

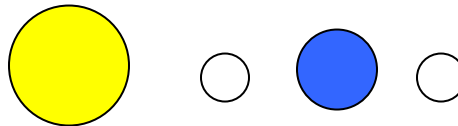
How often have you built a fort or sand castle on the beach only to have it washed away at high tide? Have you ever wondered what causes the tides to rise and fall? The moon is the closest spatial body to the earth and it exerts a strong **gravitational** pull. This gravitational force pulls the water in the oceans towards the moon. But at the same time the earth itself is affected by the moon's gravity, so the earth is 'pulled away' from the water on the opposite side from the moon. This means that when it is high tide on one side it is high tide on the other as well!

In 24 hours the earth **rotates** a full 360 degrees. In the same period of time the moon rotates 12 degrees around the earth. This means that wherever you are on the coast there will be a high tide approximately every 12 hours 25 minutes.

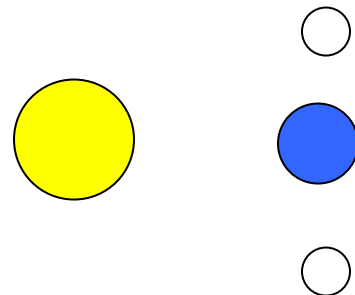


When the sun, moon and earth are in line with each other, which happens about every 14 days at full moon and new moon, they cause higher and lower tides than usual, called **spring tides**.

This is because the sun adds its gravitational pull to that of the moon.



When the sun and moon are at right angles to each other, during the first and last quarter of the moon, they pull in different directions and cause the least difference between high and low tides. These are called **neap tides**.



Sometimes, because the moon's orbit is not completely even, the moon is closer to the earth than usual. When this happens during new moon, when the moon is between the earth and the sun, there is an unusually high tide, called the **proxigean spring tide**. This only happens about once every 18 months.

Name _____

Date _____

What Causes the Tides? Questions

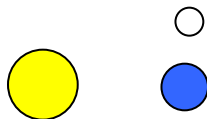
A. What do you know about tides?

1. What kind of tide would you get from this line-up of sun, earth and moon?



1.a. Can you explain, in your own words, how the tide is caused.

2. What kind of tide would you get from this line-up of sun, earth and moon?



2.a. Can you explain, in your own words, how the tide is caused.

B. True or false?

Can you answer these questions without looking at the reading?

1. Neap tides are caused when the sun and moon pull from opposite directions. T/F
2. The earth rotates 360 degrees in 24 hours. T/F
3. Tides are caused by the gravitational force of the moon. T/F
4. The sun has nothing to do with the tides. T/F
5. A proxigean spring tide only happens when the moon is full. T/F
6. Spring tides are both higher and lower than usual. T/F

Name _____

Date _____

What Causes the Tides? Answers

Activity A.

1. Spring tide.

1.a. The children should give the following information in their own words:

The sun, moon and earth are in line with each other, which happens about every 14 days at full moon and new moon, causing higher and lower tides than usual, called **spring tides**, because the sun adds its gravitational pull to that of the moon

2. Neap tide.

2.a. The children should give the following information in their own words:

The sun and moon are at right angles to each other during the first and last quarter of the moon and they pull in different directions which causes the least difference between high and low tides.

Activity B.

1. False

2. True

3. True

4. False

5. False

6. True