Learning about the Tides
- A Fun Tidal Quiz & Worksheet

Did you know that the moon is 384,400 km away from the Earth. The gravitational pull from the moon is so strong that it has an effect on the ocean, causing tides.

There are a lot of fun facts to learn about tides. Check out the following quiz to see what questions you can answer. If you need to, search online to help find the answers. One you have all of the answers, test your friends and family's knowledge to see what they know.

A moonless Earth

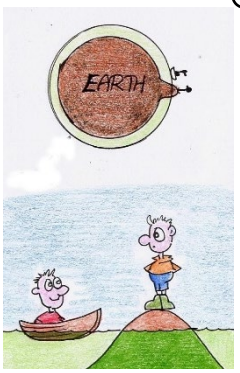


Illustration by John Joyce

1. **What would happen to the ocean if there wasn't a moon orbiting Earth?**
   a. A moonless Earth would mean that the water of the ocean would be equally distributed around the earth and we would almost have no high or low tides at all.
   b. A moonless Earth would create the lowest tides.
   c. A moonless Earth would cause the sun to dry up the Ocean leaving no water on planet Earth.

High Tides and Low Tides

As the moon orbits our planet, while the Earth is rotating around the sun, the part of the Earth that is facing the moon experiences a stronger gravitational pull towards the moon from the Earth's centre. It is so strong that it causes the water in the ocean to 'bulge' outwards towards the moon.

The centre gravity of the earth is also pulled at the same time. This causes a bulge on the opposite side of the planet. The 'bulges' also move along with the pull of the moon as it orbits Earth. The areas of the Earth where the 'bulging' of the ocean is occurring is experiencing **high tides**.

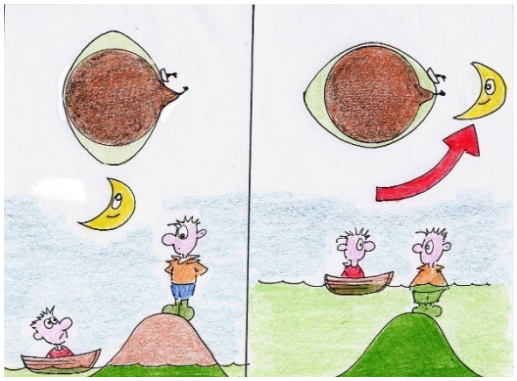


Illustration by John Joyce

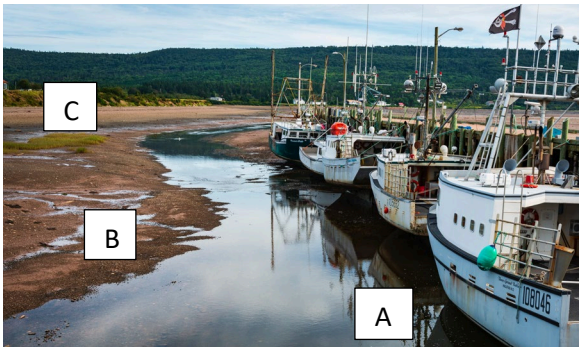
2. What type of tides are formed in the other areas where there is no bulge, where the water is pulled away from the Earth?

a. Low tides are formed b. No tides are formed c. The ocean freezes

3. Why does the moon have a stronger influence on the Earth, than the sun, causing tides?

a. The moon is much, much closer to the Earth than the sun, causing a greater gravitational pull on the Earth and Ocean.
b. The moon is larger than the sun, causing a greater gravitational pull on the Earth and Ocean.
c. The moon is further away from the Earth than the sun, causing a greater gravitational pull on the Earth and Ocean.

Identify the tides



4. A low tide is at what point on the land when the tide goes out?

a. The lowest point on land
b. The lowest point halfway down the seashore
c. The highest point on land

5. In the picture on the left, the tide is out. Can you point out where the high tide line is during high tide: A, B, or C? _____

Spring Tides and Neap Tides

6. Tides that have the <u>largest daily tidal range</u> occur during the new-moon and the full moon phases (every 14 days). This happens when the earth, moon and sun are aligned. For example the <u>moon</u> is between the earth and sun; or the <u>earth</u> is between the moon and sun. What type of tide is this called?

a. Spring tide. b. Neap tide. c. A Tidal wave

7. A neap tide occurs when the Moon and the Sun are at right angles with the Earth - when the moon is at its first or third quarter. This causes a smaller tidal range than average and are known as the weakest tides. Lowest of low tides occur approximately how often?

a. Once a week. b. Every 14 days. c. Once a month.

8. Draw an illustration to show the position of the Moon, Sun and Earth during a spring tide and neap tide.

A picture to show how the Moon, Sun and Earth create Spring Tides

A picture to show how the Moon, Sun and Earth create Neap Tides

Tides and Times

9. When the moon rotates around the Earth, it takes slightly longer than 24 hours to line up again exactly with the same point on the Earth. This means that the tides are not at exactly the same time every day. How far ahead is the tidal time every 24 hours?

a. About 5 minutes b. About 15 minutes c. About 50 minutes

Reading Tide Tables

When planning a trip to the seashore, it is important to be able to read the tide table in advance so you can make sure you don't arrive when the tide is high and the seashore is covered by the retreating ocean.

10. Examine the following tide table for Galway to practice reading a tide table .

a. What month is the tide tables for? _____

b. If you wanted to go to the Seashore on Saturday the 4th what is the best time and what is the low tide? Time: _____ Height of the Low tide: _____

Remember: The Low tide will be expressed as a small number, or possibly a negative number on tide tables. This number indicates the relationship between the water depth at its lowest ebb and Chart Datum.

c. Can you find a low tide indicated by a negative number. What day and time is this?
Date: _____ Time: _____ Tide: _____

d. Find the high tide information on Saturday the 4th _____

Remember: A High tide will be expressed as a larger number. This number indicates how high above Chart Datum the tide will be at its greatest swell in metres.

e. If it rains on the 4th and you now have to chang the date to go to the seashore on the following Saturday 11th April, what time is low tide? _____

f. Read the time. The time on the tide table is listed using a 24 hour clock. Be certain that you have distinguished properly between morning and evening tide times. **What time is high tide on the Sunday 19th in the morning: _____and in the afternoon: _____**

Galway - April 2020

01 Wed ◐ 04:52 1.8m 11:18 3.7m 17:23 2.1m 23:51 3.8m	**02** Thu 06:20 1.9m 12:55 3.6m 19:02 2.1m	**03** Fri 01:29 3.8m 07:55 1.7m 14:26 3.9m 20:26 1.9m	**04** Sat 02:47 4.1m 09:04 1.4m 15:31 4.3m 21:28 1.5m
05 Sun 03:48 4.6m 09:56 0.9m 16:21 4.7m 22:16 1.0m	**06** Mon 04:35 5.0m 10:40 0.5m 17:03 5.1m 22:58 0.6m	**07** Tue 05:19 5.4m 11:21 0.2m 17:44 5.4m 23:40 0.3m	**08** Wed ○ 06:01 5.6m 12:02 -0.0m 18:24 5.6m
09 Thu 00:21 0.1m 06:43 5.7m 12:43 0.0m 19:05 5.6m	**10** Fri 01:03 0.2m 07:26 5.5m 13:25 0.2m 19:48 5.4m	**11** Sat 01:48 0.4m 08:10 5.2m 14:09 0.6m 20:31 5.1m	**12** Sun 02:33 0.7m 08:56 4.8m 14:55 1.0m 21:17 4.7m
13 Mon 03:24 1.1m 09:48 4.3m 15:47 1.5m 22:10 4.3m	**14** Tue ◑ 04:25 1.5m 10:51 3.9m 16:51 1.9m 23:16 3.9m	**15** Wed 05:42 1.8m 12:15 3.6m 18:19 2.2m	**16** Thu 00:44 3.7m 07:15 1.9m 13:52 3.6m 19:54 2.2m
17 Fri 02:13 3.7m 08:35 1.8m 15:05 3.8m 21:03 2.0m	**18** Sat 03:16 4.0m 09:28 1.6m 15:54 4.1m 21:50 1.7m	**19** Sun 04:03 4.2m 10:09 1.3m 16:31 4.3m 22:26 1.5m	**20** Mon 04:39 4.4m 10:41 1.1m 17:02 4.6m 22:56 1.2m
21 Tue 05:11 4.6m 11:11 0.9m 17:31 4.7m 23:26 1.0m	**22** Wed 05:42 4.8m 11:40 0.8m 18:00 4.9m 23:56 0.9m	**23** Thu ● 06:12 4.9m 12:10 0.8m 18:29 4.9m	**24** Fri 00:25 0.8m 06:42 4.9m 12:39 0.8m 18:59 4.9m
25 Sat 00:56 0.9m 07:13 4.8m 13:10 0.9m 19:29 4.8m	**26** Sun 01:28 1.0m 07:46 4.7m 13:42 1.1m 20:02 4.7m	**27** Mon 02:04 1.1m 08:23 4.5m 14:18 1.3m 20:38 4.5m	**28** Tue 02:44 1.3m 09:03 4.2m 15:00 1.6m 21:21 4.3m
29 Wed 03:33 1.5m 09:56 4.0m 15:54 1.8m 22:17 4.1m	**30** Thu ◐ 04:39 1.7m 11:08 3.8m 17:07 2.0m 23:32 3.9m		

g. Explain the different symbols used on the tide table: Clue: Last Quarter • Full Moon, New Moon • First quarter


_____
_____


_____
_____


_____
_____


_____
_____

Tide table of Galway downloaded from https://www.sailing.ie.

Find out the Tides in Your Area

11. What day this month is the best day and time to go to the seashore?

Date: _____ Time: _____ Low Tide: _____High Tide _____ Moon: _____

Tide table for Dublin, Cork Harbour and Belfast are available at https://www.sailing.ie.

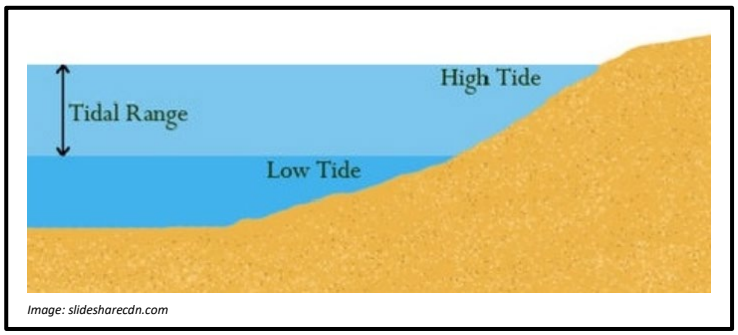


Image: slidesharecdn.com

The tidal range is the vertical difference between the highest tide and the lowest tide.

Facts about Tidal Ranges around the World

Coastal tidal ranges vary around the world. The range from low to high tides can vary from near 0m to 16 metres in some places. This can depend on the volume of water adjacent or next to the coast and the geographical region the water sits in. For example the shape of the coastline and the bathymetry or depth and slope of the coastal basin or the shape, and width of areas of bays or estuaries.

12. What is the name of the bay in Canada where world's largest tidal range occurs at 16.3m?

a. Bay of Fundy b. Bay of Islands c. Galway Bay

13. Some of the smallest tidal ranges occur in what parts of the world?

a. The Mediterranean and Baltic Seas b. The Caribbean Seas c. All of the above

The Severn Estuary in the United Kingdom (between England and Wales) also experiences tidal ranges up to 15 metres. During the highest tides on the upper reaches of this area, the rising tide is funnelled up the estuary. Instead of flooding the Severn bore is formed. This is a self-reinforcing solitary wave travels rapidly upstream against the river current.

14. What recreational activity takes place on during this special tide and wave that only occurs following a new or full moon?

a. Diving b. Sailing c. Surfing

What other interesting facts can you find out about Tides