

Tides

By Sharon Fabian

¹ Fishermen make their living from the sea, and information about tides can be important in their jobs. In many places, they can find out when the day's high tides and low tides will occur by looking them up in a tide table.

² Tides affect other jobs, too, from beach rental businesses to the US Navy.

³ But tides are mysterious forces, and they are not easy to predict. Tides tables are made only after observing conditions in a coastal area for a long period of time. These observations must take into account many variables because tides have many causes.

⁴ The main cause of tides is the moon. The moon's gravity pulls on the earth and causes tides. The moon pulls up a bulge of water in the ocean on the side of the earth facing the moon. Because of the force caused by the earth's rotation, there will also be a bulge in the ocean on the opposite side of the earth. As these bulges in the ocean move to shore, they result in high tides.



⁵ In areas of the earth near the equator, such as on islands in the Caribbean Sea, the tides are fairly small. In other areas farther north or south, the tides may be much larger. In the Bay of Fundy in Nova Scotia, high tides may rise up to fifty feet.

⁶ The reason why tides do not occur at the same time each day has to do with the moon. Since the moon is the main cause of tides, tides occur on moon time. The moon circles the earth once in about every twenty-five hours, not every twenty-four as we would expect on earth time. It works out this way because the earth is revolving at the same time that the moon is circling around it. So, since tides operate on moon time, they happen about one hour later each day compared to the day before.

⁷ The sun also affects tides on earth. The pull of the sun, however, is only about half as strong as the pull of the moon because the moon is so much closer.

⁸ The largest tides occur when the pull of the sun lines up with the pull of the moon and reinforces it. These large tides are called spring tides. The smallest tides occur when the pull of the sun works in opposition to the pull of the moon. These small tides are called neap tides.

⁹ The earth's rotation also affects its tides. The rotation of the earth produces centrifugal force which works with the pull of the moon to produce those bulges in the ocean that cause tides.

¹⁰ There are other factors that also affect how high the tide will rise on a particular day, although their effects are small in comparison to the pull of the moon, the pull of the sun, and the forces caused by the earth's rotation. These factors include wind and air pressure. They also include local factors such as the shape of the shoreline and the depth of the ocean floor in a particular area.

¹¹ The other planets also have gravity, and their pull reaches the earth, too, but the effects are so small that they are not usually taken into account in figuring out the tides.

¹² Anyone who is trying to figure out when the next high or low tide will occur must take all of the important factors into account. The effects of the sun and moon are constant, but figuring out how one will affect the other gets complicated. The effects of wind and air pressure vary from time to time. And factors such as the shape of the shoreline and the depth of a particular area of the sea change over time. That is why it requires observations and record keeping over a long period of time to create a good tide table. With a good tide table, the tides can be predicted with accuracy, not just for the current day, but well into the future.

¹³ Even if you don't work in a job that makes it important to know when the next high or low tide will be, you can still observe the effects of the tides whenever you visit the shore. If you are in the right place, you can also observe unusual phenomena caused by the tides such as the reversing waterfall effect in Cobscook Bay, Maine. Just the idea that tides happen day after day in locations all over the world is quite a phenomenon in itself.

Tides

<p>1. The main cause of tides is the _____.</p> <p><input type="radio"/> A Earth's rotation</p> <p><input type="radio"/> B Sun</p> <p><input type="radio"/> C Moon</p> <p><input type="radio"/> D Planets</p>	<p>2. All of the following are important causes of tides except _____.</p> <p><input type="radio"/> A The other planets' gravity</p> <p><input type="radio"/> B The earth's rotation</p> <p><input type="radio"/> C The moon's gravity</p> <p><input type="radio"/> D The sun's gravity</p>
<p>3. Large tides that occur when the pull of the moon's gravity and the pull of the sun's gravity reinforce each other are called _____.</p> <p><input type="radio"/> A Spring tides</p> <p><input type="radio"/> B Neap tides</p> <p><input type="radio"/> C Fall tides</p> <p><input type="radio"/> D Full tides</p>	<p>4. Small tides that occur when the pull of the moon and the pull of the sun are in opposition to each other are called _____.</p> <p><input type="radio"/> A Neap tides</p> <p><input type="radio"/> B Full tides</p> <p><input type="radio"/> C Fall tides</p> <p><input type="radio"/> D Spring tides</p>
<p>5. The high tide in a particular area can be affected by _____.</p> <p><input type="radio"/> A The type of sand on the shore</p> <p><input type="radio"/> B The depth of the sea in the area</p> <p><input type="radio"/> C The temperature of the water</p> <p><input type="radio"/> D The number of fish in the water</p>	<p>6. High and low tides cause a reversing waterfall effect in Cobscook Bay, Maine.</p> <p><input type="radio"/> A False</p> <p><input type="radio"/> B True</p>
<p>7. Name at least four things that affect the tides.</p> <p>_____</p> <p>_____</p>	<p>8. What are the names for the largest tides and the smallest tides?</p> <p>_____</p> <p>_____</p>

