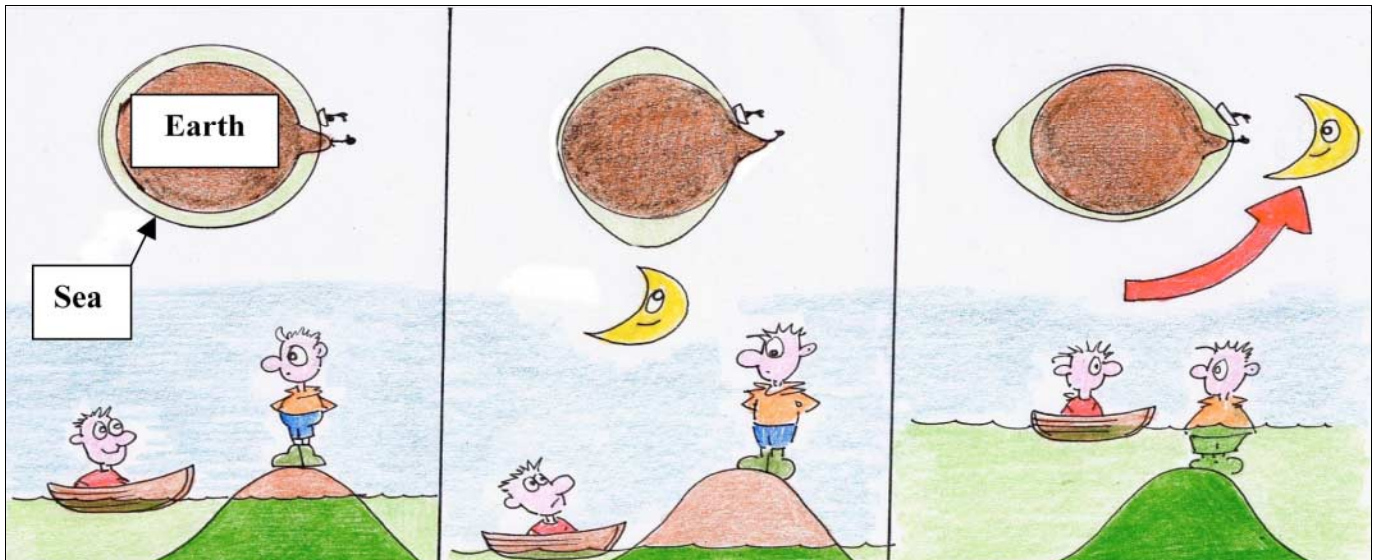


Why the tide comes in . . .



No Tide

If there were no moon and no sun, the only force acting on the oceans would be the gravity of the earth.

The sea would cover the earth in a completely even coating - like the chocolate around a Malteser sweet - and there would be no high or low tides . . .

The two people in the picture, on the rock and in the boat, would always be at the same levels.

Low Tide

But because the moon is such a huge lump of rock, it has a gravity of its own, which pulls on the earth like a huge magnet.

This pulls the sea up into a bulge beneath it and also makes a bulge on the other side of the earth.

This pulls the water away from where our people are, making the boat lower than the rock.

High Tide

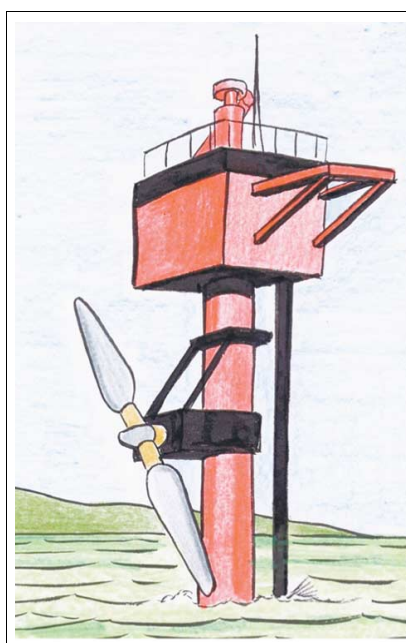
Then, as the moon rotates around the earth, the bulge of water moves to where our two people are and the boat rises above the rock. High tides occur every 12 hours and twenty five minutes because, while the Earth takes 24 hours to rotate on its own axis, the moon is also orbiting the earth once every 28 days. This means that the moon moves on ahead of the Earth's own rotation by around 50 minutes each full day ($1/28 \times 24 = 51.53$ to be precise) so that each high tide occurs approximately 25 minutes later than that last one (51.3 divided by two = 25.65 minutes).

Spring tides - very low and very high tides - happen when the sun and the moon are pulling in the same direction.

Tidal Power

In France, where the tides are very high and very low, there is enough power in the moving water to power a turbine and generate electricity.

At La Rance, a huge dam has been built across the tide which forces the incoming and outgoing tides through a turbine, which in turn, powers a generator giving up to 240 Megawatts of power.



Power from the Tides

In 2008 the SeaGen Offshore Tidal Project placed the largest and most powerful tidal turbine in the world near the site of the old Nendrum Monastery Tide Mill at Strangford Lough in Northern Ireland. This turbine employs two 16-metre diameter rotors, capable of operating on both the ebb and flow of the tide, generating up to 6,000 MWh per year - approximately the rate of energy capture of a 2.4 MW rated wind turbine.

**Captain
Cockle's Log**

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