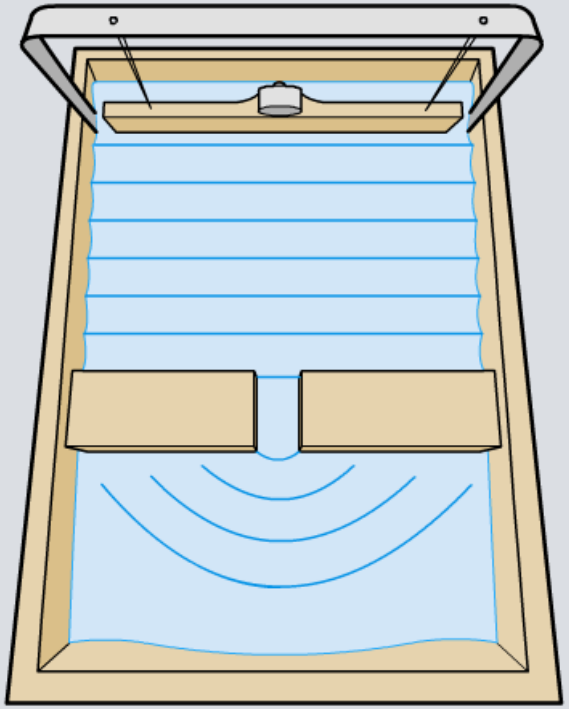
Diffraction



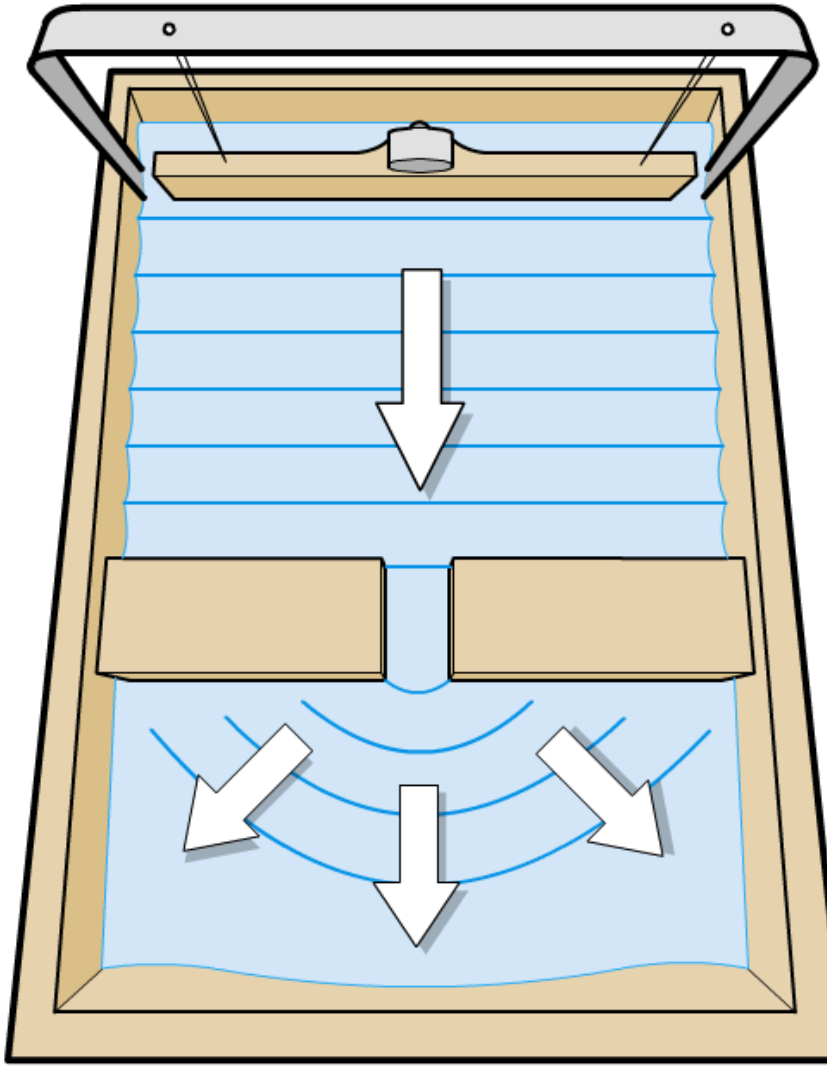
What is diffraction?

Diffraction is a property of all waves, which can be shown by water waves in a ripple tank.

Here, the waves travel along until they reach a gap. The width of the gap is **similar** to the wavelength of the waves.

The waves pass through the gap and spread out. This is called **diffraction**.

So, when radio waves travel past an obstacle or through a narrow gap, they bend or spread out due to diffraction.



How does wavelength affect diffraction?

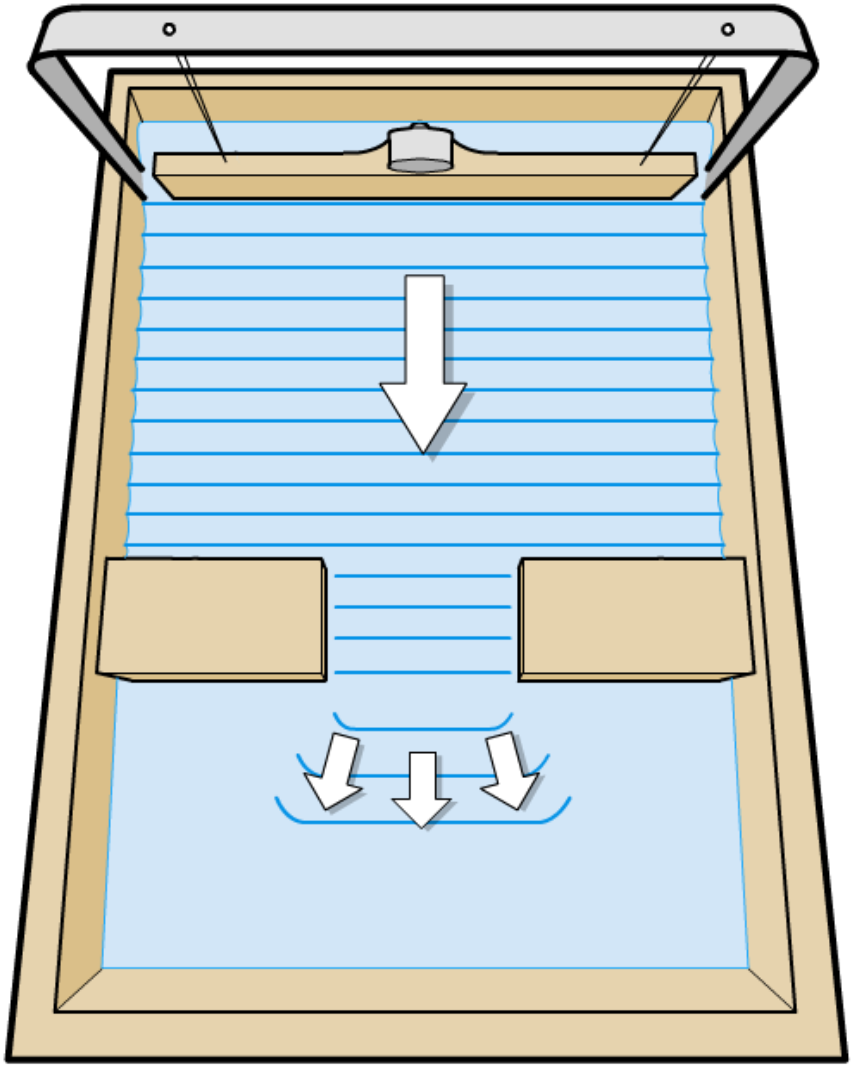
The amount of diffraction depends on how the **wavelength** compares with the size of the gap.

What happens if the wavelength is much smaller than the width of the gap?

In this case, only the edges of the wave front are diffracted.

The amount of diffraction depends on wavelength.

The longer the wavelength, the greater the diffraction.



Why can I receive radio but not TV?

How does wavelength affect diffraction?

In some places, television reception is poor but radio reception is good.

This is due to the diffraction of radio waves of different wavelengths.

Click "**play**" to find out why.

When have I experienced diffraction?

How can the teacher hear the band but not see them?

Sound waves have a wavelength similar in size to the width of the doorway, and so are diffracted as they pass through.

Light waves have a much shorter wavelength than sound waves, and so are not diffracted by the doorway.

This means the band can be heard, but not seen, by the teacher in the corridor.

Why do some radio waves travel far?

Which of these statements about radio waves are true or false?

1.	Radio waves are very high energy and so are very dangerous.	
2.	Radio waves cannot pass through solid materials.	
3.	Ghosting of television pictures can be caused by television signals bouncing off tall buildings.	
4.	In hilly areas, people can receive radio signals because of diffraction.	
5.	Waves with a short wavelength are diffracted more than waves with a long wavelength.	
6.	Short-wavelength radio waves are used to broadcast television signals.	

true false

?

solve