Transverse Waves

Apparatus

torsional wave device – see picture below

These can be easily made using a length of string or two strips of sticky-tape and icy-pole sticks or drinking straws. The device can be hung from a stand or attached to the ceiling if very large.

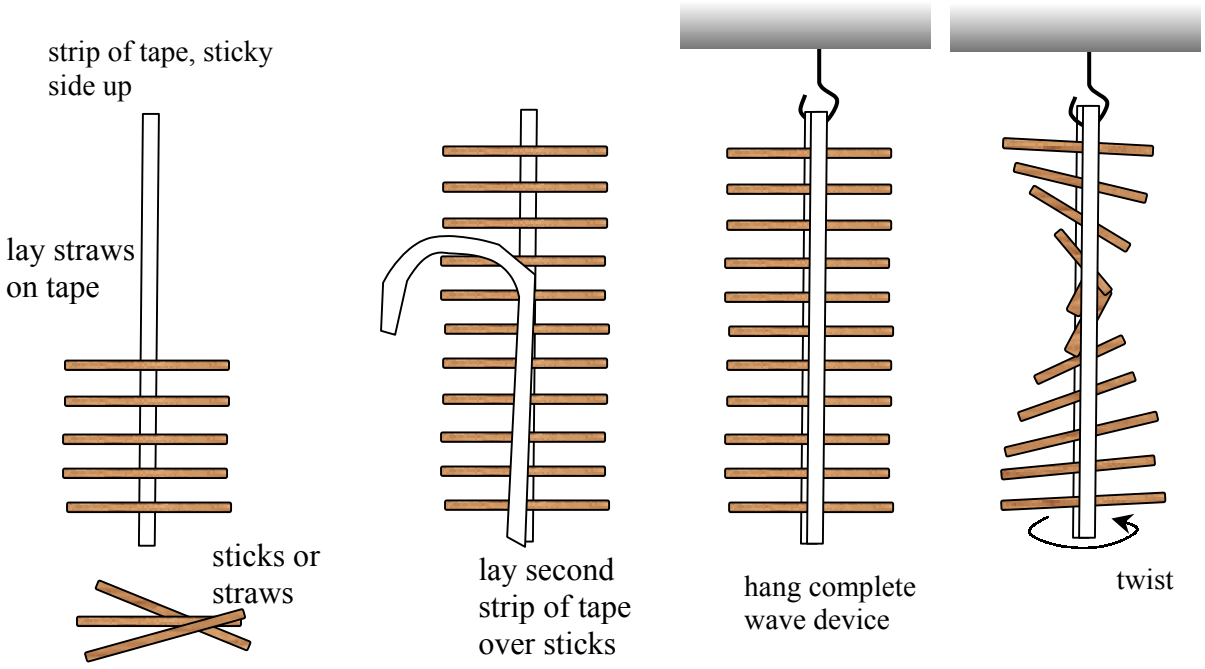
Action

The students twist the bottom straw or stick, and then release it. This causes a torsional wave to travel up the string, and reflect off the fixed top end.

The Physics

The wave produced is a transverse wave, the direction of displacement of the particles (the rods) is perpendicular to the direction of travel of the wave. It is different to more familiar transverse waves, such as waves on a vibrating string, in that the displacement is due to twisting, and the amplitude would be described by an angle rather than a linear displacement.

Note: if you have long tutorials, it is fun for students to build their own wave machine.



Accompanying sheet

Transverse Waves

Examine the wave machine.
Send a wave from the bottom to the top.
This is a torsional or "twisting wave".

Explain why this is called a transverse wave.
How is it different to the transverse waves you are familiar with?