6.1.3 Transverse and longitudinal waves

videos

All types of wave can be divided into two groups – transverse and longitudinal.

Look at the animations on the website linked below:

https://www.acs.psu.edu/drussell/demos/waves/wavemotion.html

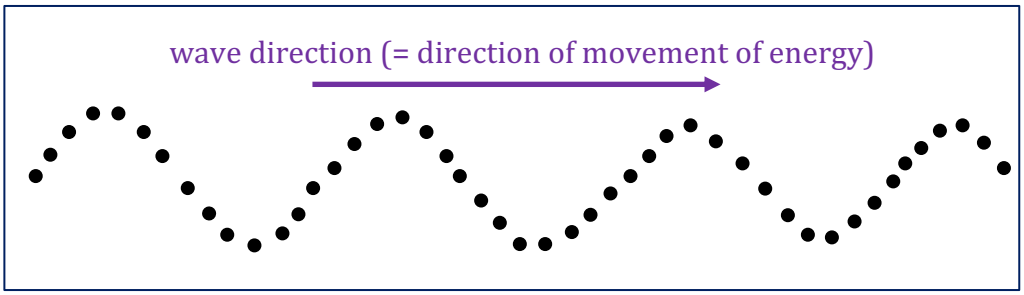
Carefully observe how the particles in transverse and longitudinal waves move. In both cases the wave is moving left to right.

(1) Circle the correct answers in the following summary:

*"In longitudinal waves the oscillations (of particles) are **at right angles/parallel** to the direction that the wave is travelling."*

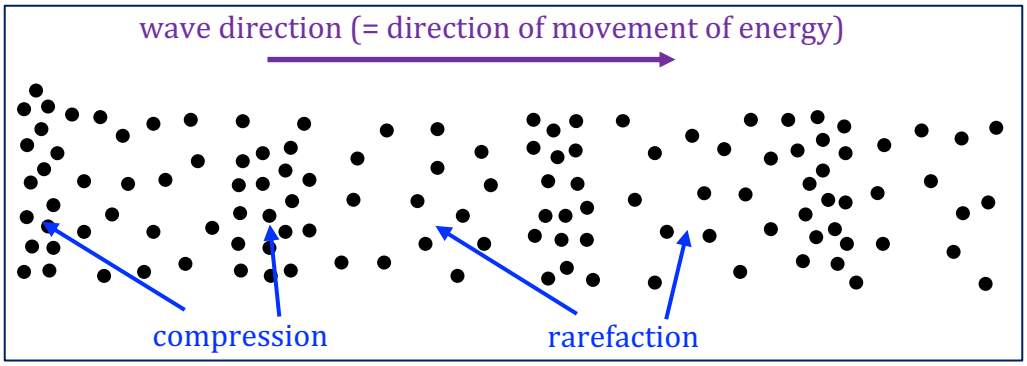
*"In transverse waves the oscillations (of particles) are **at right angles/parallel** to the direction that the wave is travelling."*

TRANSVERSE WAVE



(2) Draw arrows on one of the particles (above) to show how the particle is oscillating.

LONGITUDINAL WAVE



(3) Draw arrows on one of the particles (above) to show how the particle is oscillating.

(4) In longitudinal waves, what are regions where particles are closer together called?

(5) In longitudinal waves, what are regions where particles are further apart called?

Not all waves involve particles vibrating (i.e. material waves). Electromagnetic waves involve the oscillation of electric and magnetic fields.

Look at the following animation of an electromagnetic wave:

https://www.walter-fendt.de/html5/phen/electromagneticwave_en.htm

You can see that the electric and magnetic fields oscillate at right angles to the direction that the wave is moving.

(6) Are electromagnetic waves transverse or longitudinal waves?

(7) Do some research to sort out the following types of wave into either longitudinal or transverse waves.

electromagnetic wave, sound wave, seismic P-wave, seismic S-wave, water wave

transverse wave	longitudinal wave

Slinky waves

Both transverse and longitudinal waves can be demonstrated using a slinky.

Look at the following video:
https://www.youtube.com/watch?v=iT4KAc0Ag1E&ab_channel=ChrisGozzard

(8) How is the end of the spring moved to create i) a transverse wave, ii) a longitudinal wave?