

Teacher's notes for radiation and matter lesson **one formative assessment**

Cards:

Pupils are handed out the cards and they have to match the terms to their definition, but some of the definitions contain mistakes which must be corrected. The first team to find every mistake and match everything correctly wins.

Mistakes are:

Wavelength: card says measured in seconds. Should be metres.

Frequency: card says this is the number of waves. Should be number of waves per second.

Wave speed: card says this is the time taken for wave to travel one metre. Should be the distance the wave travels in one second.

Amplitude: card says this is the distance from trough to crest. Should be the distance from the centre to the crest or trough.

Frequency: card says this is twice the frequency of the source. Should be the same as the frequency of the source.

Wave energy: card says this depends on wavelength. Should be amplitude.

After this they can play a game by dealing out the terms to the players in a group of 3 (one left over) and putting the definitions upside-down in a pile (shuffled first). They turn the definitions over one at a time and if they have the correct term to match it place it down. The first player to get rid of all their cards is the winner.

Or by combining sets of cards the game of snap could be played by two players in control of the cards, but groups on each side to shout snap when it happens. One player acts as the judge of speed between the teams. If there are say four sets of cards its best to combine them so each snap set contains only half the terms and definitions. This way snap is more likely to happen. So there would be two snap sets for the class.

Worksheet:

Pupils work through this in small groups.

A wave

transmits energy from place to place.

Wavelength of a wave

is the minimum distance in which the wave repeats. It is measured in seconds (s).

Frequency of a wave

is the number of waves. It is measured in Hertz (Hz).

Period of a wave

is the time taken for one wave to go past a point or the time for one wave to be transmitted. It is measured in seconds (s).

The wave speed

is the time taken for the wave to travel one metre and is measured in metres/second (ms^{-1}).

Amplitude of a wave

is the distance from the trough (bottom) to the crest (top) of the wave. It is measured in metres (m)

Wave speed, frequency and wavelength

are related by the wave equation $v = f\lambda$

The frequency of a wave

is twice the frequency of the source of the wave.

Period of a wave

is given by $1 / \text{frequency}$.

The wave energy

Depends on the wavelength. The larger the wavelength the more energy being carried by the wave.

Some other terms to remember

1. Draw two pictures that compare two waves in phase with two waves that are exactly out of phase.

2. If two waves are COHERENT they have the same frequency, wavelength and speed and have a constant phase relationship.

Draw two different diagrams each showing a pair of coherent waves of light. Mark the speed on both diagrams.

3. Compare reflection and refraction. You can use diagrams to help you.

Similarities between reflection and refraction

Differences between reflection and refraction