Radiations and Waves

Wave Behaviour

Website: BBC Bitesize:
http://www.bbc.co.uk/education/guides/zq4tyrd/revision

I can define and give examples of a transverse and longitudinal wave.	O	O	O
I can define and use the following wave characteristics: amplitude, wavelength, wavespeed, frequency.	O	O	O
I can use the wave equation: Wavespeed = Frequency x Wavelength for water waves and sound waves.	O	O	O
I can use the relationship: Wavespeed = Distance / time for all waves (including light)	O	O	O

Evaluation of Progress

My Targets are…..

To achieve my targets I will have to…

Sound

Website: http://www.bbc.co.uk/education/guides/zq4tyrd/revision/3

I can state that sound can travel through solids, liquids and gases but not a vacuum.	O	O	O
I can describe an experiment that will measure the speed of sound in air.	O	O	O
I can state that the speed of sound in air is 340 m/s and that this is slower than the speed of light ($3x10^8$ m/s).	O	O	O
I can give examples that demonstrate that the speed of light is faster than the speed of sound.	O	O	O
I can give qualitative examples relating to the speed of sound in various materials with regard to the density of the material.	O	O	O
I can state an example where the Doppler effect has altered the frequency of a moving sound as heard by the listener.	O	O	O
I can give examples of the practical applications of the Doppler effect (eg: Radar)	O	O	O

Evaluation of Progress

My Targets are…..

To achieve my targets I will have to…

The Electromagnetic Spectrum

Website: http://www.bbc.co.uk/education/guides/z79hvcw/revision/1

I can state what the EM spectrum is and can state the relevant parts in order of frequency or wavelength.	O	O	O
I can state that all parts of the EM spectrum travel at the same speed: $v = 3x10^8$ m/s.	O	O	O
For each constituent part of the EM spectrum I can state a suitable source and receiver.	O	O	O
For each constituent part of the EM spectrum I can state an application of that particular frequency.	O	O	O

Evaluation of Progress

My Targets are…..

To achieve my targets I will have to…

Light (1)

Website: http://www.bbc.co.uk/education/guides/z2kp34j/revision

I can describe what happens to a light ray when it enters an optically denser medium.	O	O	O
I can describe what happens to a light ray when it leaves an optically denser medium.	O	O	O
I can label on a ray diagram the following: Normal, angle of incidence, angle of refraction, incident ray, refracted ray.	O	O	O
I can describe why refraction occurs by referring to the relative wave speeds of the light in the materials.	O	O	O
I can describe the principle of total internal reflection.	O	O	O
I can describe applications that use total internal reflection of light (endoscopes, fibreoptic communication, binoculars)	O	O	O

Evaluation of Progress

My Targets are…..

To achieve my targets I will have to…

Light (2)

I can define what is meant by the Critical Angle as it relates to total internal reflection.	O	O	O
By experiment, I can measure the critical angle for any given material.	O	O	O
I can state qualitatively what happens to the transmission of light as the angle of incidence approaches the critical angle and beyond the critical angle.	O	O	O
I can use the relationship: $n = 1 / \sin_{ic}$ to determine the critical angle of a given material.	O	O	O

Evaluation of Progress

My Targets are…..

Nuclear Radiation

Websites: http://www.bbc.co.uk/education/guides/zm8nb9q/revision

I can describe the nature of Alpha, Beta and Gamma radiation.	O	O	O
I can explain the term ionisation.	O	O	O
I can state the difference in ionisation for Alpha, Beta and Gamma radiation.	O	O	O
I can state the approximate range and penetrating power of the three types of ionising radiations.	O	O	O
I can state the appropriate health and safety precautions required for using ionising radiation.	O	O	O
I can describe an appropriate method in which to measure the activity of a source.	O	O	O
I can state what background radiation is and the source of background radiation.	O	O	O
I can describe an experiment to determine the background radiation including any measurements and analysis required.	O	O	O

Evaluation of Progress

My Targets are…..

To achieve my targets I will have to…

Dosimetry

Websites: http://www.bbc.co.uk/education/guides/zm8nb9q/revision/7

	1st Attempt	2nd Attempt	3rd Attempt
I can state what Equivalent Dose is and how Equivalent Dose can vary due to a number of natural or artificial sources.	O	O	O
I can describe a number of uses and applications of nuclear radiation (eg: industry and medicine)	O	O	O
	O	O	O

Evaluation of Progress

My Targets are…..

To achieve my targets I will have to…

Half-life

Websites: http://www.bbc.co.uk/education/guides/zm8nb9q/revision/6

	1st Attempt	2nd Attempt	3rd Attempt
I can state that the activity of a radioactive source will decrease with time.	O	O	O
I can state that the time taken for the activity to decrease by half is known as the half-life of a substance.	O	O	O
I can describe a method where the half-life of a substance is determined by a measuring the activity over a time period and the half-life determined by graphical means.	O	O	O
	O	O	O

Evaluation of Progress

My Targets are…..

Nuclear Fission and Fusion

Websites: http://www.bbc.co.uk/education/guides/zm8nb9q/revision/10

	1st Attempt	2nd Attempt	3rd Attempt
I can explain what is involved with either a nuclear fission or fusion reaction.	O	O	O
I can state from a nuclear equation describing nuclear decay whether an Alpha particle, Beta particle or Gamma ray is emitted.	O	O	O
I can describe the interactions between particles during a fission or fusion reaction.	O	O	O
I can state from a nuclear equation whether nuclear fusion or fission is taking place.	O	O	O
I can state that under the correct conditions, when nuclear fusion or fission take place, the mass of products is not equal to the mass of the reactants.	O	O	O
I can state that the difference in mass between reactants and products is known as the "lost mass" or "mass defect".	O	O	O
I am aware that Albert Einstein stated that mass and energy were interchangeable and can be converted from one into the other.	O	O	O
I can state that the lost mass in a nuclear reaction is when matter is turned into energy. This energy is released by the reaction.	O	O	O
I can state the practical applications of fission reactions, in particular –when used to generate electrical energy.	O	O	O

Evaluation of Progress

My Targets are…..

To achieve my targets I will have to…