Waves, Light and the Electromagnetic Spectrum

Opportunities for Breadth and Challenge:			
Links to Sequencing for Learning: This unit links to previous work on This unit prepares pupils for work in			
Section	What we are learning (key knowledge)	Key words	Assessment
1	Describing Waves • What do waves transfer? • How can we describe waves? • What is the difference between a longitudinal wave and a transverse wave?	Wavelength, Longitudinal, Transverse, Amplitude, Velocity, Period, Electromagnetic Waves.	Prior knowledge
2a	Wave Speeds • How can we calculate the speed (or velocity) of a wave? • How can we measure the speed of sound in air? • How can we measure the speed of waves on water	Wave speed, Distance, Frequency, Wavelength	Retrieval Qs of keywords
2b	Wave Investigation • *Investigate the suitability of equipment to measure the speed, frequency and wavelength of a wave in a solid and a fluid.*	Ripple Tank, Frequency, Wave Speed,	MUM- Ripple Tank investigation
3a	Refraction • What happens when waves refract? • When does refraction occur? • How does a change in the speed of a wave affect its direction?	Refraction, Interface, Normal	
3b	Investigating refraction • How can you use ray diagrams to show reflection and refraction? • *Investigate refraction in rectangular glass blocks in terms of the interaction of electromagnetic waves with matter.*	Refraction, Ray diagrams, incident angle, refracted angle	
11a	Electromagnetic spectrum – Examples and Uses • What are some examples of electromagnetic waves? • What do all electromagnetic waves have in common? • Which electromagnetic waves can our eyes detect? • What are the uses of each wave?	Frequencies, wavelengths, Transverse, Vacuum.	
11b	Electromagnetic spectrum – Hazards • What are the dangers of electromagnetic radiation?		Homework- Poster on the electromagnetic

	• How is the danger associated with an electromagnetic radiation? • How is electromagnetic radiation linked to changes in atoms and their nuclei?		spectrum, uses and dangers.
14	Revision End of Unit Test Test Feedback		Class assessment sheet EUT Test feedback sheet

Radioactivity

Opportunities for Breadth and Challenge:			
Links to Sequencing for Learning: This unit links to previous work on This unit prepares pupils for work in			
Section	What we are learning (key knowledge)	Key words	Assessment
1	Atomic Models • What particles make up atoms? • How big are atoms? • How has our model of the atoms changed over time?	atoms, elements, charge, sub atomic particles, electrons	Prior knowledge
2	Inside Atoms • What are the relative masses and charges of the particles that make up atoms? • What are the isotopes of an element? • How can isotopes be represented using symbols?	Isotope, nucleons, relative mass, protons, electrons, mass number, atomic number	Retrieval Qs of keywords
3	Electrons and Orbits • How are electrons arranged in an atom? • What happens to atoms when they absorb or emit electromagnetic radiation? • How do atoms become ionised?	Ionisation, spectrum, absorption spectrum, visible light, electronic configuration	
4	Background radiation • What is meant by background radiation? • What are the sources of background radiation? • How is radioactivity detected and measured?	Count rate, dose, Geiger muller tube	
5	Types of radiation • What are alpha particles, beta particles and gamma radiation? • How do the different kinds of radiation compare in their ability to penetrate materials? • How do the different kinds of radiation compare in their ability to ionise atoms?	Penetrate, alpha, beta, gamma,	
6	Radioactive decay • How does beta decay occur? • How are atomic and mass numbers affected by different kinds of decay? • How can radioactive decays be represented decays be represented in nuclear equations?	Nuclear equation, beta, decay	
7	Half Life • How does the activity of a substance change over time?	Half life, becquerels, activity	

	• What does the half-life of a radioactive substance describe? • How can the half-life be used to work out how much of a substance decays?		
8	Dangers of Radioactivity • What are the dangers of ionising radiation? • What precautions should be taken to protect people using radiation? • What is the difference between contamination and irradiation effects?	Contamination, Radiation, mutation	
9	Revison		
10	End of unit test		
11	Test review and feedback		

Energy- Forces Doing Work

Opportunities for Breadth and Challenge:			
Links to Sequencing for Learning: This unit links to previous work on This unit prepares pupils for work in			
Section	What we are learning (key knowledge)	Key words	Assessment
1	Work and Power • How can energy of a system be changed? • What is work done and how can it be measured? • What is power and how is it calculated?	Energy, Work done, Watts. Power, Joules, Newtons.	Prior knowledge
2	Objects affecting each other- Split into 3 lessons- Gravity, Magnetic and Static • What forces are there when two objects are touching? • How can objects affect each other without touching? • How are pairs of forces represented?	Gravity, Gravitational fields, Static electricity, Magnets, Magnetic fields, action-reaction forces.	Retrieval Qs of keywords
3	Vector Diagrams HIGHER • What is a free body diagram? • How and why do we resolve force? • How do all the forces on a single body combine to affect it?	Resultant force, Free body diagram. Scale diagram.	Drawing a vector diagram.
4	Revison		
5	End of unit test		
6	Test review and feedback		