YEAR 11 SCIENCE: PHYSICS

Half Term 3

MAGHULL HIGH SCHOOL – CURRICULUM MAP

Unit: **Waves** **LESSONS**	1. Transverse and longitudinal waves 2. Properties of waves 3. Wave speed (required practical) 4. **Reflection of waves (required practical)** 5. **Refraction of waves (required practical)**	6. **Sound Waves** 7. **Waves for detection and exploration** 8. Electromagnetic waves 9. Properties of electromagnetic waves 10. Uses of electromagnetic waves	11. Absorption of waves (required practical) 12. **Lenses** 13. **Visible Light** 14. **Blackbody Radiation**
Knowledge & Skills Development	• Describe the difference between longitudinal and transverse waves • Describe evidence that, for both ripples on a water surface and sound waves in air, it is the wave and not the water or air itself that travels • Recall, use and rearrange equations for frequency and wave speed • Identify amplitude and wavelength from given diagrams • Describe a method to measure the speed of sound waves in air • Describe a method to measure the speed of ripples on a water surface • **Construct ray diagrams to illustrate the reflection of a wave at a surface** • Describe the effects of reflection, transmission and absorption of waves at material interfaces • **Describe, with examples, processes which convert wave disturbances between sound waves and vibrations in solids** • **Explain why such processes only work over a limited frequency range and the relevance of this to human hearing** • **Explain how the differences in velocity, absorption and reflection between different types of wave in solids and liquids can be used both for detection and exploration** • Describe similarities and differences between the waves of the electromagnetic spectrum	• Give brief explanations why each type of electromagnetic wave is suitable for the practical application • Use wave front diagrams and ray diagrams to explain refraction in terms of the change of speed that happens when a wave travels from one medium to a different medium • Describe factors that affect the absorption of electromagnetic waves • Describe the change in atoms when electromagnetic waves are absorbed • **Construct ray diagrams to illustrate the similarities and differences between convex and concave lenses** • **Apply the equation for magnification** • **Explain how the colour of an object is related to the differential absorption, transmission and reflection of different wavelengths of light by the object** • **Explain the effect of viewing objects through filters or the effect on light of passing through filters** • **Explain why an opaque object has a particular colour** • **Explain that all bodies (objects) emit radiation** • **Explain that the intensity and wavelength distribution of any emission depends on the temperature of the body** • **Use information, or draw/interpret diagrams to show how radiation affects the temperature of the Earth's surface and atmosphere**	
Assessment / Feedback Opportunities	**Formative Assessment** Teacher questioning Quizzes Exam style questions	**Summative assessment** End of topic assessment Exam questions in future end of topic assessments to assess recall	

Key Vocabulary	Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest Transverse, Longitudinal, Vibration, Oscillation, Frequency, Amplitude, Wavelength, Medium (in physics terms), Transmission, Absorption, Reflection, Refraction, Spectrum, Electromagnetic, Lens, Convex, Concave, Magnification, Emit, Opaque, Transparent, Translucent, Filter, Blackbody
Literacy/Reading Opportunities	Subject specific vocabulary introduced before reading of related texts Word etymology from Latin and Greek roots Reading of simple and complex sentences, paragraphs, articles Scientific writing including structuring methods, comparisons and evaluations
Cross Curricular Themes	Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators Geography – P and S Waves during earthquakes
Personal Development (Including British Values, RSE, Citizenship)	None
Career Opportunities	Telecommunications, Astrophysicist, Lighting technicians, Radiographer, X-ray technician, Medical physicist