SUBJECT: Physics YEAR: 11 MTP TITLE: Uses of waves HALF TERM: 3 NO. OF LESSONS (approx): 4

Deliberate and specific retrieval of expected prior knowledge (be specific)

energy, not matter.
Recognition of sound and light as waves that travel at different speeds and through different media.
Simple identification of amplitude, wavelength, and frequency.
Awareness of reflection and refraction, particularly in light and sound.
Basic use of rays and wave diagrams.

Academic transformation (be specific)

Radio waves can be produced by oscillations in electrical circuits.

When radio waves are absorbed they may create an alternating current with the same frequency as the radio wave itself, so radio waves can themselves induce oscillations in an electrical circuit.

Changes in atoms and the nuclei of atoms can result in electromagnetic waves being generated or absorbed over a wide frequency range.

Gamma rays originate from changes in the nucleus of an atom. Ultraviolet waves, X-rays and gamma rays can have hazardous effects on human body tissue. The effects depend on the type of radiation and the size of the dose. Radiation dose (in sieverts) is a measure of the

Personal transformation (2 or 3)

- **The use of wave technology in entertainment – music, VR soundscapes, 3D cinema**

Can I Learning Questions

Can I recall the order of the EM spectrum?
Can I describe the uses of waves?
: ***Can I investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface?***
Can I describe the applications of waves?

Literacy and Oracy

Written Tasks:
Report: *"How ultrasound is used in medicine – a wave-based solution"*
Article: *"How do seismic waves help us understand the structure of the Earth?"*
Discussion Tasks:
Debate: *"Should we invest more in wave-based earthquake early warning systems?"*
Presentation: *"Everyday life without waves – what would change?"*
Useful Websites:
BBC Bitesize – Waves:
https://www.bbc.co.uk/bitesize/guides/zc4xsbk/revision/1
PhET Wave Simulations:
https://phet.colorado.edu/en/simulation/wave-on-a-string
Institute of Physics Teaching Resources – Waves:
https://www.iop.org/explore-physics/waves

Misconceptions (5 or 6 examples)

Waves move matter from place to place – misunderstanding that energy, not particles, is transferred.
All waves need a medium – not realising electromagnetic waves (e.g. light) can travel through a vacuum.
Sound can travel in space – assuming sound behaves like light.
Amplitude affects wave speed – confusing energy/intensity with velocity.
Frequency and wavelength are unrelated – not connecting them via the wave speed equation.