

Waves and Radiation Learning Intentions and Success Criteria

Wave Characteristics

Learning Intention

- I can identify longitudinal and transverse waves.
- I understand that frequency is the number of waves per second.
- I know the meaning of the terms wavelength and amplitude of transverse waves.
- I can use numerical or graphical data to determine the frequency of a wave.
- I can use an appropriate relationship between wave speed, frequency and wavelength to carry out calculations
- I can use an appropriate relationship between distance, speed and time for waves.

Success Criteria

I can:

- Carry out actions associated with the above learning outcomes successfully
- I can relate the amplitude of a wave to the energy of that wave

Manipulating Sound

Learning Intention

- I can analyse sound waveforms including changing amplitude and frequency.
- I can use different methods of measurement of speed of sound in air.
- I can carry out sound level measurement including decibel scale.
- I am aware of noise pollution; risks to human hearing and methods of protecting hearing. I can explain applications of sonar and ultrasound.
- I am aware of sound reproduction technologies.
- I can explain what is meant by noise cancellation.

Success Criteria

I can:

- Carry out the Learning Outcomes above to an acceptable standard
- I can carry out the speed of sound LO1
- I can identify the risk to my own hearing due to my everyday life

Light

Learning Intention

- Light as a member of the electromagnetic spectrum
- Law of Reflection
- Comparing angle of incidence and angle of refraction
- Comparing focal lengths of lenses and power of a lens
- Uses of lenses
- Diffraction

Success Criteria

I can:

- State that all e-m radiation travels at the speed of light in air
- Carry out an experiment to prove the Law of Reflection
- Carry out an experiment to show that the angle in air is greater than the angle in glass or perspex
- Carry out an experiment to show the difference in focal lengths of convex and concave lenses and relate this to the curvature of the lens
- Calculate the power of a lens from its focal length
- Relate power of lenses to correcting sight defects
- Compare the patterns formed when white light passes through a diffraction grating and a prism
- Discuss various uses of lenses

The Electromagnetic Spectrum

Learning Intention

- I can state applications and hazards associated with electromagnetic radiations.
- I can describe approaches to minimising risks associated with electromagnetic radiations.

Success Criteria

I can:

- State the methods of detection of the members of the e-m spectrum
- State applications of the different members of the e-m spectrum
- Explain the dangers of exposure to certain members of the e-m spectrum

Nuclear Radiation

Learning Intention

- Natural and artificial sources of nuclear radiation and associated medical and industrial applications.
- Consideration of the pros and cons of generating electricity using nuclear fuel.
- Comparison of risk due to nuclear radiation to other hazards and management of risks

Success Criteria

I can:

- Debate the pros and cons of using gamma radiation

Nuclear Power Generation

Learning Intention

- I can debate the pros and cons of generating electricity using nuclear fuel.
- I can compare the risk due to nuclear radiation to other hazards and determine how to manage these risks.

Success Criteria

I can:

- Identify the risks associated with nuclear energy and compare these with the risks associated with fossil fuel energy production and problems with alternative energy sources
- Identify methods of reducing risk in the production of nuclear power
- Identify risks and benefits associated with radiotherapy