

P1 REVISION - CHAPTER 1a - Energy Transfer by Heating

Infrared Radiation

What gives off infrared radiation?

What is a vacuum?

Surfaces & Radiation

What surfaces are good absorbers of infrared radiation?

What surfaces are slow to emit infrared radiation?

What surfaces are good reflectors of infrared radiation?

States of Matter

Draw and label the 3 states of matter.

Conduction/Convection

Where does conduction occur?

Where does convection occur?

What is a poor conductor called?

Why does a fluid become less dense when it is heated?

Evaporation & Condensation

What 3 things can increase the rate of evaporation

What 2 things can increase the rate of condensation?

Give an explanation of how they differ to each other.

KEY WORDS:

Absorbers
Emitters
Reflectors
Conduction
Conductor
Insulator

ASSESSMENT:



P1 REVISION - CHAPTER 1b - Energy Tfr continued.

The greater the temperature difference between an object and its surroundings, the greater the rate at which energy is transferred. What else does the rate at which energy is transferred depend on?

How can we maximise the rate of energy transfer to keep things cool?

Specific Heat Capacity

The specific heat capacity of a substance is the amount of energy required to raise the temperature of 1 kilogram of the substance by 1 degree celsius.

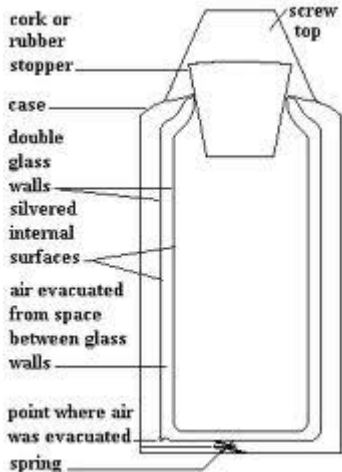
The equation for specific heat capacity is:

$$E = m \times c \times \theta$$

What do the symbols stand for and what are the units for each?

How can the structure of the vacuum flask minimise energy transfer by conduction, convection and radiation?

23.05 Dewar flask, vacuum flask



The specific heat capacity of water is 4200J/kg°C. How much energy is needed to raise the temperature of 2kg of water by 1°C?

KEY WORDS:

Specific heat capacity
Mass
Temperature difference
Maximise
minimise

ASSESSMENT:



P1 REVISION - CHAPTER 2 - Using Energy

Conservation of energy?
What does this mean?

What can you not do to energy?

Useful Energy.

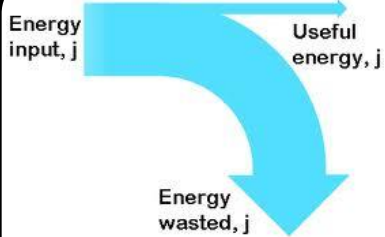
Name the useful energy of a light bulb.

What is the wasted energy of a light bulb?



Forms of Energy

Type	Example
Chemical	Food/fossil fuels



Energy & Efficiency

What does this diagram show?

What is it called?

$$\text{Efficiency} = \frac{\text{useful energy transferred by the appliance}}{\text{total energy supplied to the appliance}} \quad (\times 100\%)$$

Does efficiency have a unit?

In a light bulb, for 25 joules of energy that are supplied to the bulb, 5 joules are usefully transferred into light energy. What is the efficiency of the bulb?

How can you make machines more efficient?

KEY WORDS:
Joule
Efficiency
Sankey Diagram
Useful energy
conservation

ASSESSMENT:



P1 REVISION - CHAPTER 3 - Electrical Energy

Fill in the box with at least 4 more electrical appliances.

Electrical Appliance	Type of energy produced
Lamp	Light

Electrical Power

What is the equation for power?

An electric motor transfers 48J of electrical energy into kinetic energy in 2 mins. What is the useful power output of the motor?

Useful Electrical Energy

What is a kilowatt-hour?

$$E = P \times t$$

E =

P =

t =

Total cost = number of kWh x cost per kWh

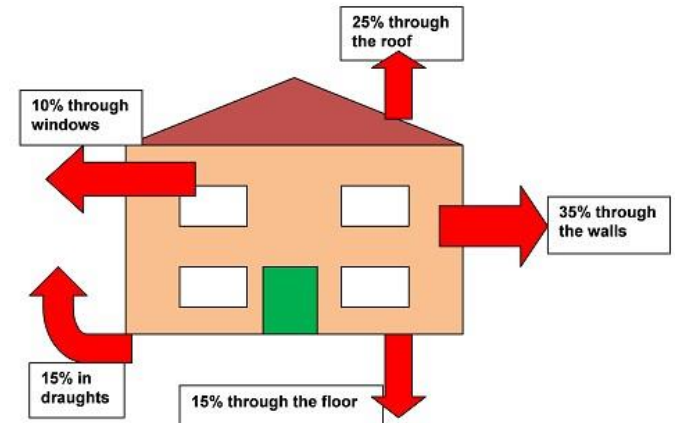
The price of 1kWh of electrical energy is 9p. How much does it cost to use a 60W electric light for 4hrs?

Cost Effectiveness Matters

What costs are involved in different appliances?

What is payback time?

Loft insulation costs £600.00 including installation. It saves £80.00 per year on the fuel bill. How long is the payback time?



KEY WORDS:
 Kilowatt-hour (kWh)
 Power
 Electrical appliance
 Payback time
 watt

ASSESSMENT:



P1 REVISION - CHAPTER 4 - Generating Electricity

Nuclear

What fuel is used in a Nuclear power station?

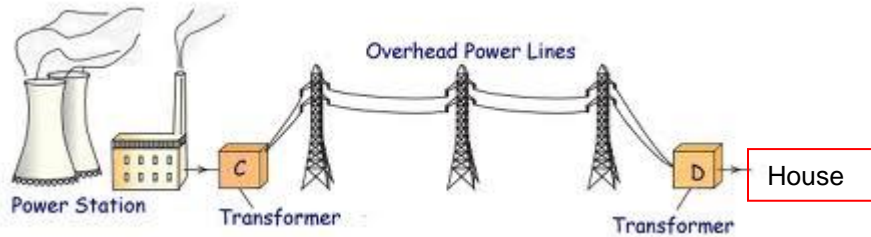
What process releases the energy?

Does it produce green house gases?

Draw a flow diagram to show how a power station produces electricity.

	BENEFITS	DRAWBACKS
Fossil fuels		
Biofuel		
Water		
Sun		
Wind		

National Grid



What do the transformers C and D do and why?

KEY WORDS:

Turbine
Generator
Nuclear Fission
Non-renewable
renewable
transformers

ASSESSMENT:



P1 REVISION - CHAPTER 5a - Waves

What do we use waves for?

With a transverse wave the oscillation (vibration) of the particle is _____ to the direction in which the wave travels.

Mechanical Waves

Give an example.

Are they transverse, longitudinal or both?

What type of wave can be produced on a stretched string?

Longitudinal Wave

The oscillation of the particles is _____ to the direction of the travel of the wave.

A longitudinal wave is made up of c _____ and r _____.

Give an example of a longitudinal wave.

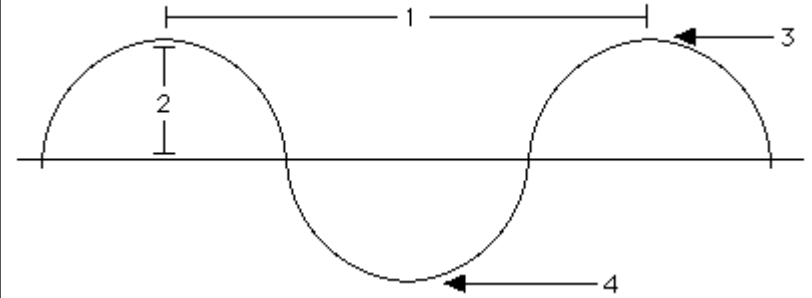
Electromagnetic waves

Give two examples:

Are they transverse or longitudinal?

Can they travel through a vacuum?

Measuring Waves



Label the above diagram with Amplitude, wavelength, peak and trough.
Then give an explanation on the following three terms including the units:
Amplitude:

Wavelength:

Frequency:

$$\text{Speed} = v = f \times \lambda$$

What is the speed of waves with a frequency of 5Hz and a wavelength of 2m?

KEY WORDS:

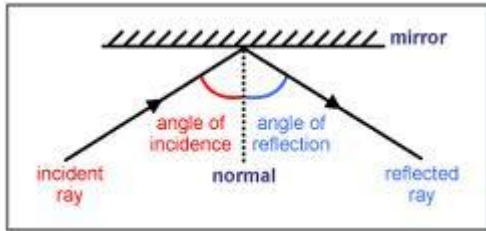
Amplitude
Frequency
Wavelength
Oscillation
Transverse
Longitudinal

ASSESSMENT:



P1 REVISION - CHAPTER 5b - Wave Properties

Reflection



What is the normal?

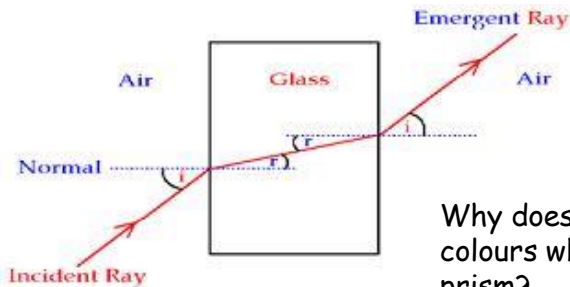
Where are angles always measured between?

What does the law of reflection state?

What is a real image?

What is a virtual image?

Refraction



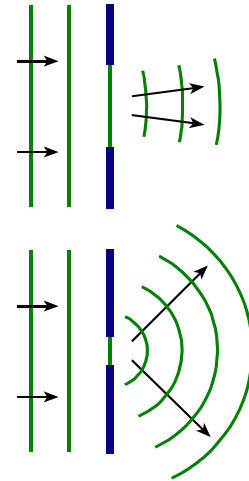
Refraction of light is the change of direction of a light ray when it crosses a boundary between two transparent substances.

Why does light split up into different colours when it passes through a triangular prism?

If the speed is reduced refraction is towards the normal. Give an example:

If the speed is increased refraction is away from the normal. Give an example:

Diffraction



Diffraction is the spreading out of waves when they pass through a gap or round the edge of an obstacle.

Write down the difference when the wave goes through a narrow gap or a wide gap.

Why might people living in hilly areas have poor radio reception?

KEY WORDS:

Incidence
Reflection
Real image
Virtual image
Normal
Refraction

ASSESSMENT:



P1 REVISION - CHAPTER 5b - Sound

Sound

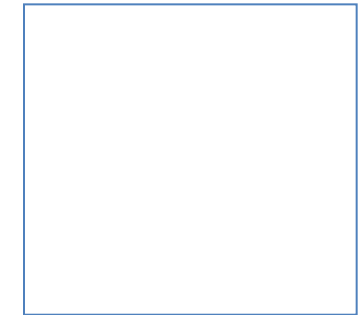
What is the frequency range for the normal human ear?

Sound waves are what type of wave?

What are reflections of sound called?



Explain why you will not be able to hear this electric bell.

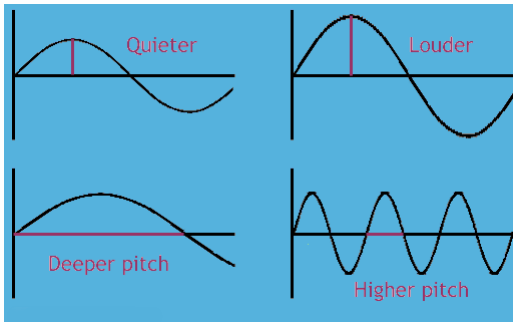


Practice sketching waveforms, eg. Sketch a wave with twice the frequency and half the amplitude of your original wave.



Musical Sounds

What does the pitch of a note depend on?



What does the loudness of a note depend on?

KEY WORDS:

Sound
Echo
Pitch
Frequency
Amplitude

ASSESSMENT:



P1 REVISION - CHAPTER 6 - Electromagnetic Waves

Visible Light

What is white light?

What are the colours of white light?

What waves are all used for communication?

Communications

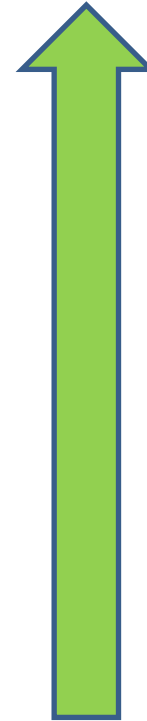
How are radio waves produced?

What is an optical fibre?

Electromagnetic Spectrum

Gamma

Shortest wavelength
Highest frequency
High Energy



You will need to know the order of the electromagnetic spectrum as it can be asked for in either decreasing or increasing wavelength, frequency or energy.

Microwaves

Longest wavelength
Lowest frequency
Low energy

Radio waves

Complete the electromagnetic spectrum

Remember

Electromagnetic waves transfer e_____ not matter.

$V = f \times \lambda$ can be used to calculate the f_____ or wavelength of electromagnetic waves.

Research is needed to evaluate whether or not m_____ p_____ are safe to use.

R_____ w_____ of different frequencies are used for different purposes.

All electromagnetic waves can travel through space at the same s_____ but they have different wavelengths and frequencies.

KEY WORDS:
Optical fibre
Electromagnetic
Gamma
Radiation
Spectrum

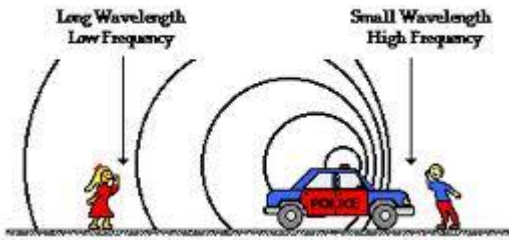
ASSESSMENT:



P1 REVISION - CHAPTER 6b - Universe

Doppler Effect

The Doppler Effect for a Moving Sound Source



For example a fire engine siren will sound different depending on whether it is moving towards you (pitch is higher) or away from you (pitch is lower).

When the source moves away from the observer the observed wavelength _____ and the frequency _____.

When the source moves towards the observer the observed wavelength _____ and the frequency _____.

Red-Shift

Light observed from distant galaxies has been 'shifted' towards the red end of the spectrum. This is known as red-shift and means that the frequency has d_____ and the wavelength has i_____.

Which galaxies are moving fastest?

How does red-shift show that the universe is expanding?

What would a blue-shift indicate?

The Big Bang

What is the Big Bang Theory?

What has been expanding ever since the Big Bang?

What is Cosmic microwave background radiation (CMBR)?

What can CMBR be explained by?

KEY WORDS:
Doppler Effect
Galaxies
Cosmic
Big Bang
Red-shift
Blue-shift

ASSESSMENT:

