

Mandatory Physics Experiments



Junior Cert Science

OP2 Measure the mass and volume of a variety of solids and liquids and hence determine their densities.

OP6 Investigate the relationship between the extension of a spring and the applied force.

OP20 Identify different forms of energy and carry out simple experiments to show the following energy conversions:

- (a) chemical energy to electrical energy to heat energy
- (b) electrical energy to magnetic energy to kinetic energy
- (c) light energy to electrical energy to kinetic energy.

OP23 Investigate and describe the expansion of solids, liquids and gases when heated, and contraction when cooled.

OP31 Carry out simple experiments to show the transfer of heat energy by conduction, convection and radiation; investigate conduction and convection in water.

OP34 Show that light travels in straight lines.

OP38 Investigate the reflection of light by plane mirrors, and illustrate this using ray diagrams; demonstrate and explain the operation of a simple periscope.

OP46 Plot the magnetic field of a bar magnet.

OP49 Test electrical conduction in a variety of materials, and classify each material as a conductor or insulator.

OP50 Set up simple electric circuits; use appropriate instruments to measure current, potential difference (voltage) and resistance, and establish the relationship between them.

Measure the mass and volume of a variety of solids and liquids and hence determine their densities.

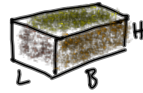
OP2

$$D = \frac{M}{V}$$

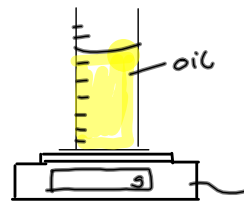
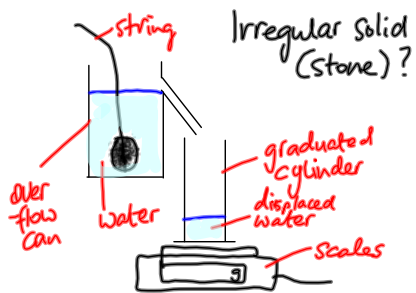
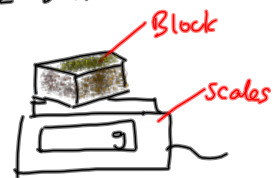
monkeys
drink
vodka

- ① get Volume
- ② get mass (use scales)
- ③ Divide , $D = \frac{m}{V}$

Regular Solid?



$$V = L \times B \times H$$

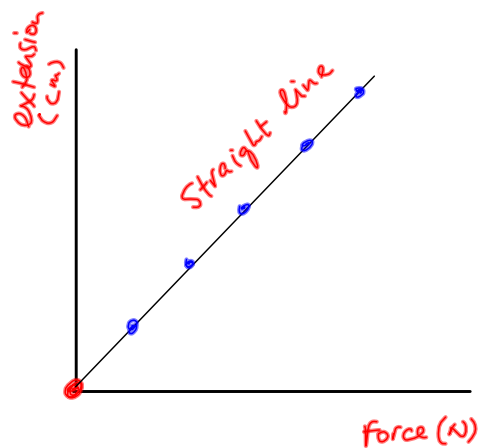
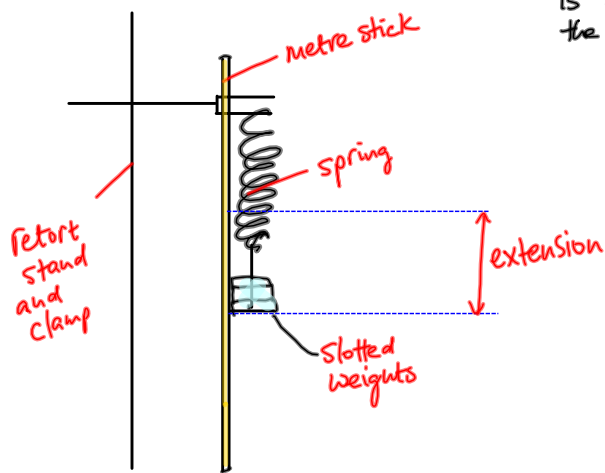


Investigate the relationship between the extension of a spring and the applied force.

OP6

Hooke's Law

the extension of a spring is directly proportional to the force causing it.



Identify different forms of energy and carry out simple experiments to show the following energy conversions:

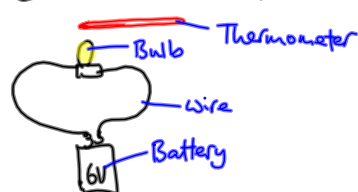
- (a) chemical energy to electrical energy to heat energy
- (b) electrical energy to magnetic energy to kinetic energy
- (c) light energy to electrical energy to kinetic energy.

OP20

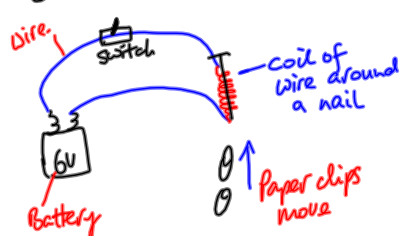
Energy is the ability to do work (J).

Principle of Conservation of energy
-energy cannot be created or destroyed but can be converted from one form to another.

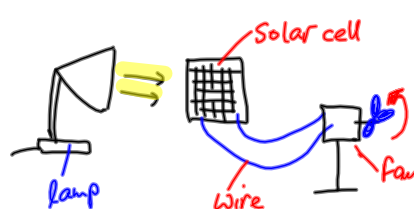
CHEMICAL → ELECTRICAL → HEAT



ELECTRICAL → MAGNETIC → KINETIC

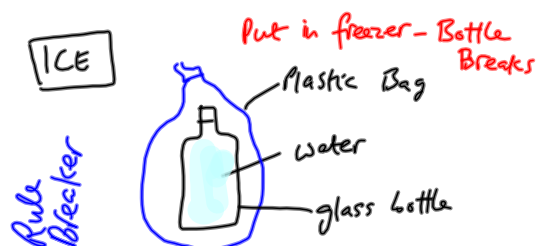
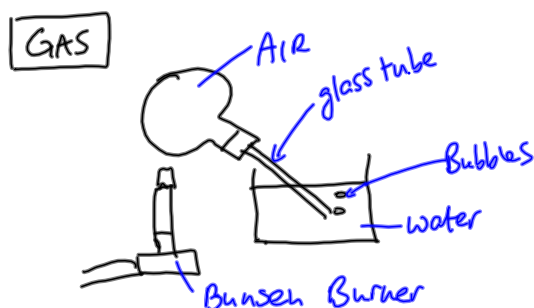
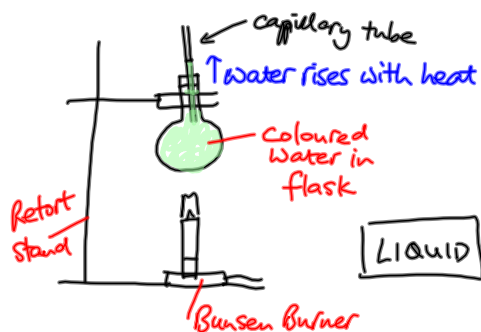
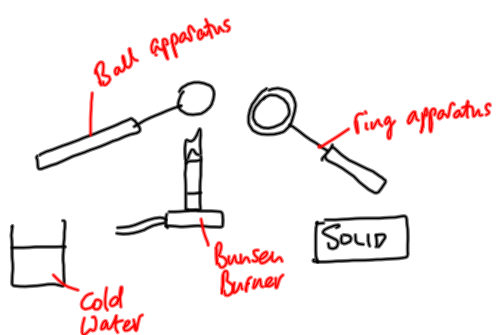


LIGHT → ELECTRICAL → KINETIC



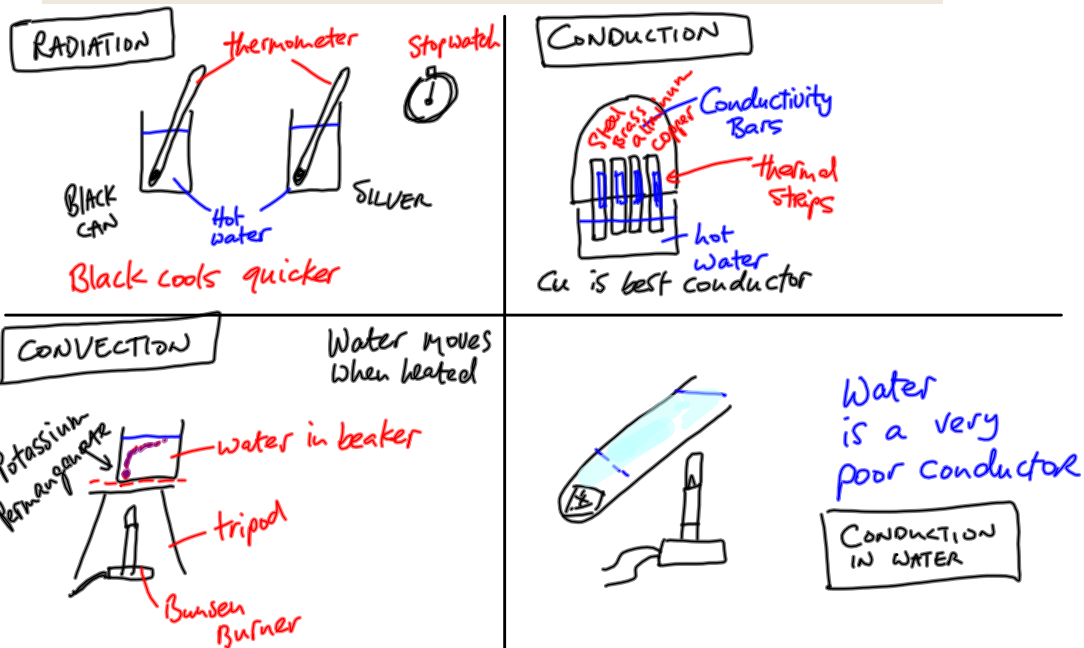
Investigate and describe the expansion of solids, liquids and gases when heated, and contraction when cooled.

OP23



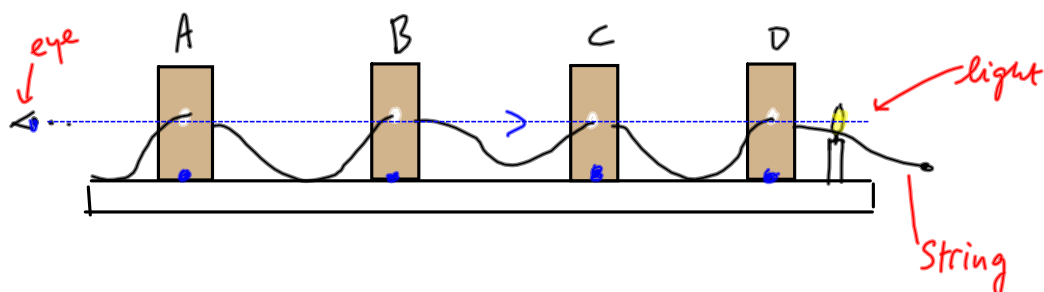
Carry out simple experiments to show the transfer of heat energy by conduction, convection and radiation; investigate conduction and convection in water.

OP31



Show that light travels in straight lines.

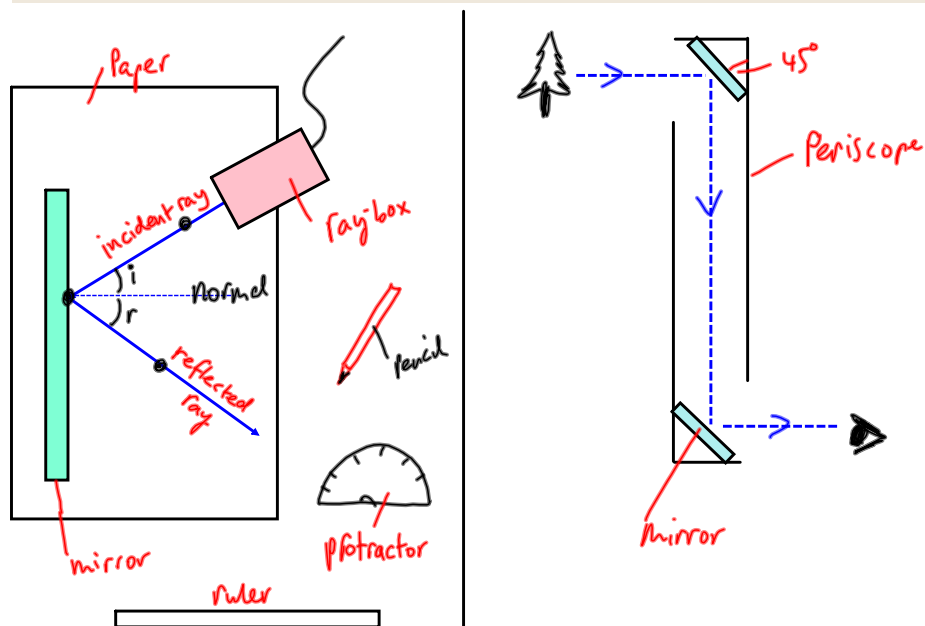
OP34



move B or C out of line \Rightarrow won't see light

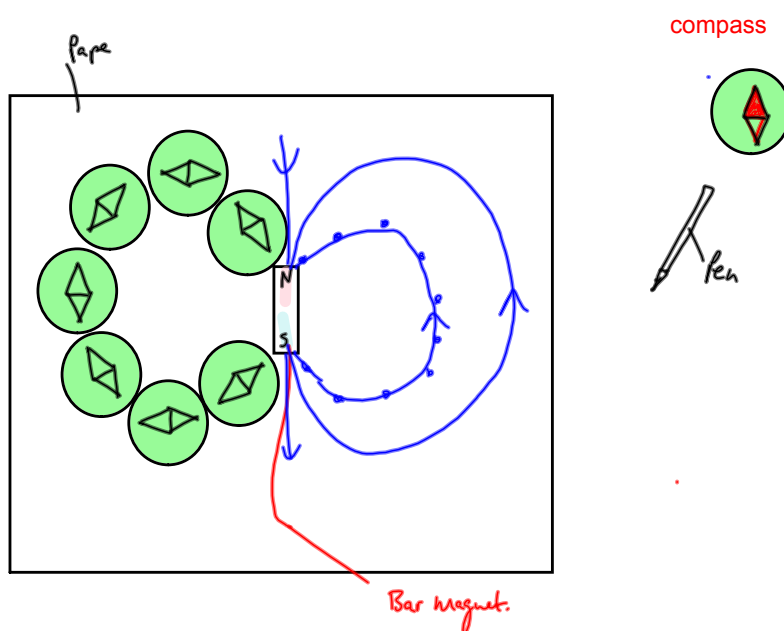
Investigate the reflection of light by plane mirrors, and illustrate this using ray diagrams; demonstrate and explain the operation of a simple periscope.

OP38



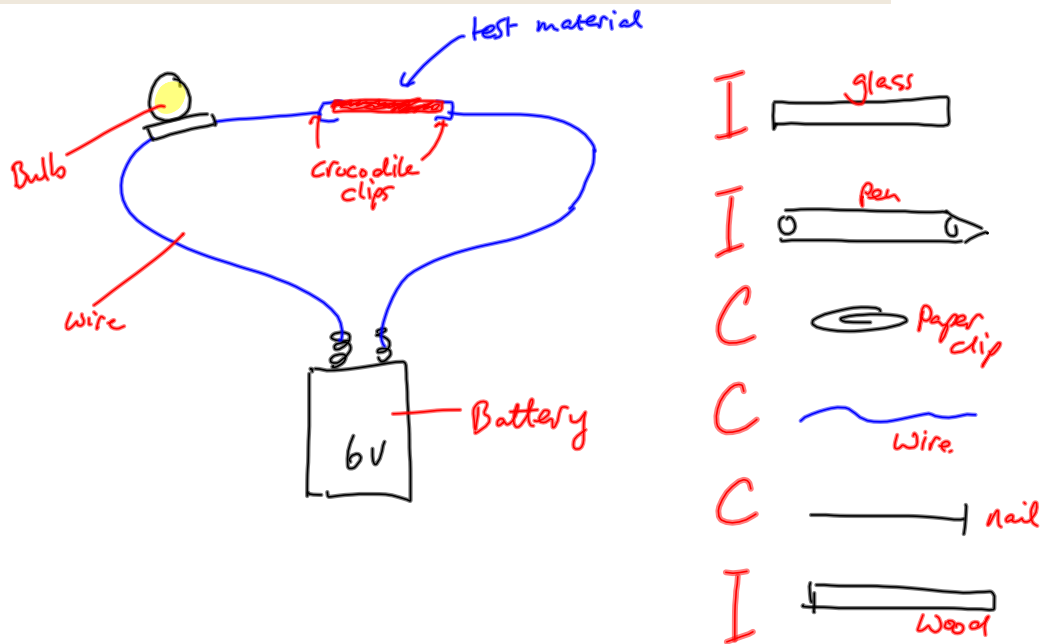
Plot the magnetic field of a bar magnet.

OP46



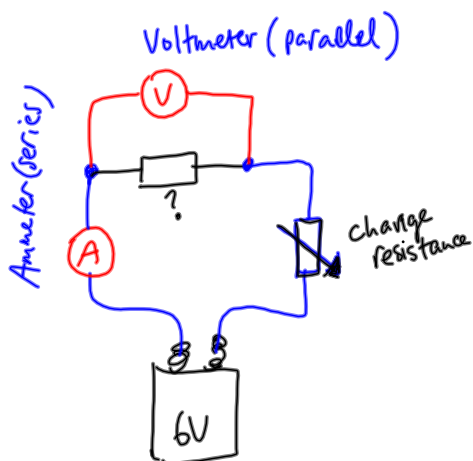
Test electrical conduction in a variety of materials, and classify each material as a conductor or insulator.

OP49

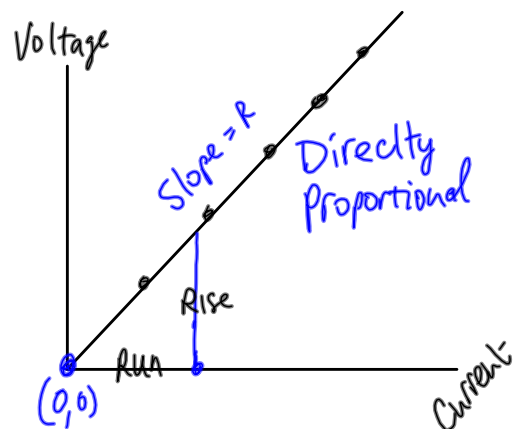


Set up simple electric circuits; use appropriate instruments to measure current, potential difference (voltage) and resistance, and establish the relationship between them.

OP50



Ohm's Law: $V = IR$



$$R = \frac{V}{I}$$