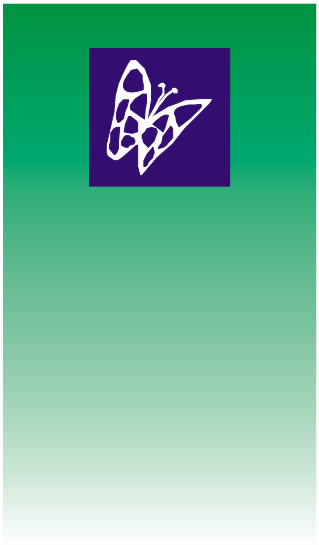

Experiment Manual for Key Stage 2

(Physical Science)

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3C13	The scratch test
3C14	Flexibility is a confusing word
3C15	How temperature effects plasticene
	Section 6: Testing absorbency
3C16	Testing the absorption of different materials

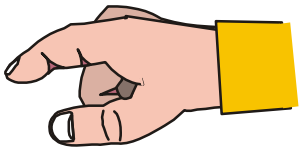
3C Equipment list

Specialised equipment		Recyclable		Standard equipment/household	
Dropper		cereal packets		Materials kitchen towels	
		Materials: paper		Materials: blotting paper	
		Materials: plastic		Materials: duster	
				Materials: news paper	
				Materials: photocopy paper	
				Materials: tissue paper	
				Materials: cotton sheet	
				Aluminium foil	
				hardness	
				erings	
				Materials: ceramic	
				Materials: chalk	
				Materials: clay	
				Materials: copper	
				Materials: cotton	
				Materials: cotton wool	
				Materials: granite (rock)	
				Materials: iron	
				Materials: paper	
				Materials: plasticine	
				Materials: rubber	
				Materials: sponge	
				Materials: wood	
				Materials: wool	
				Permanent marker	
				Plastic cups	
				Ruler	
				Sand paper	

Please note that, in order to save space in the DEMO, we have only included the equipment list for this unit. The full version will include equipment lists for all units.

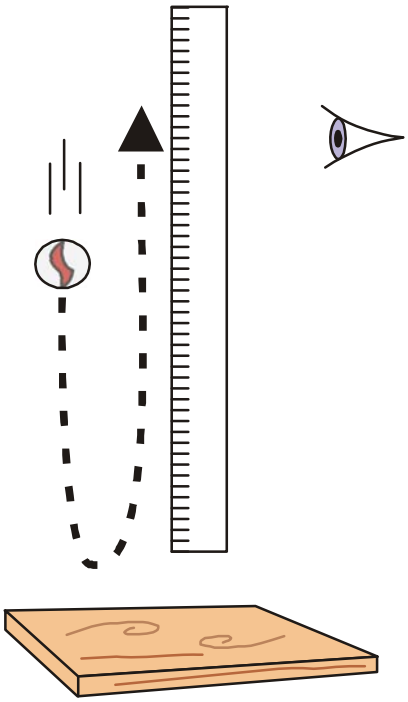
3C6 How hard is your floor?

Marbles ☐ Collection of different floor surfaces ☐ Ruler ☐



① Your teacher has supplied you with a number of different floor materials.

You are going to do a test to find how hard each material is.



② To do this drop a hard ball like a marble onto the sample and measure the height to which it bounces.

③ Fill in the table below and then represent your results on a bar graph.

Draw the height to which the ball bounces in the table below:

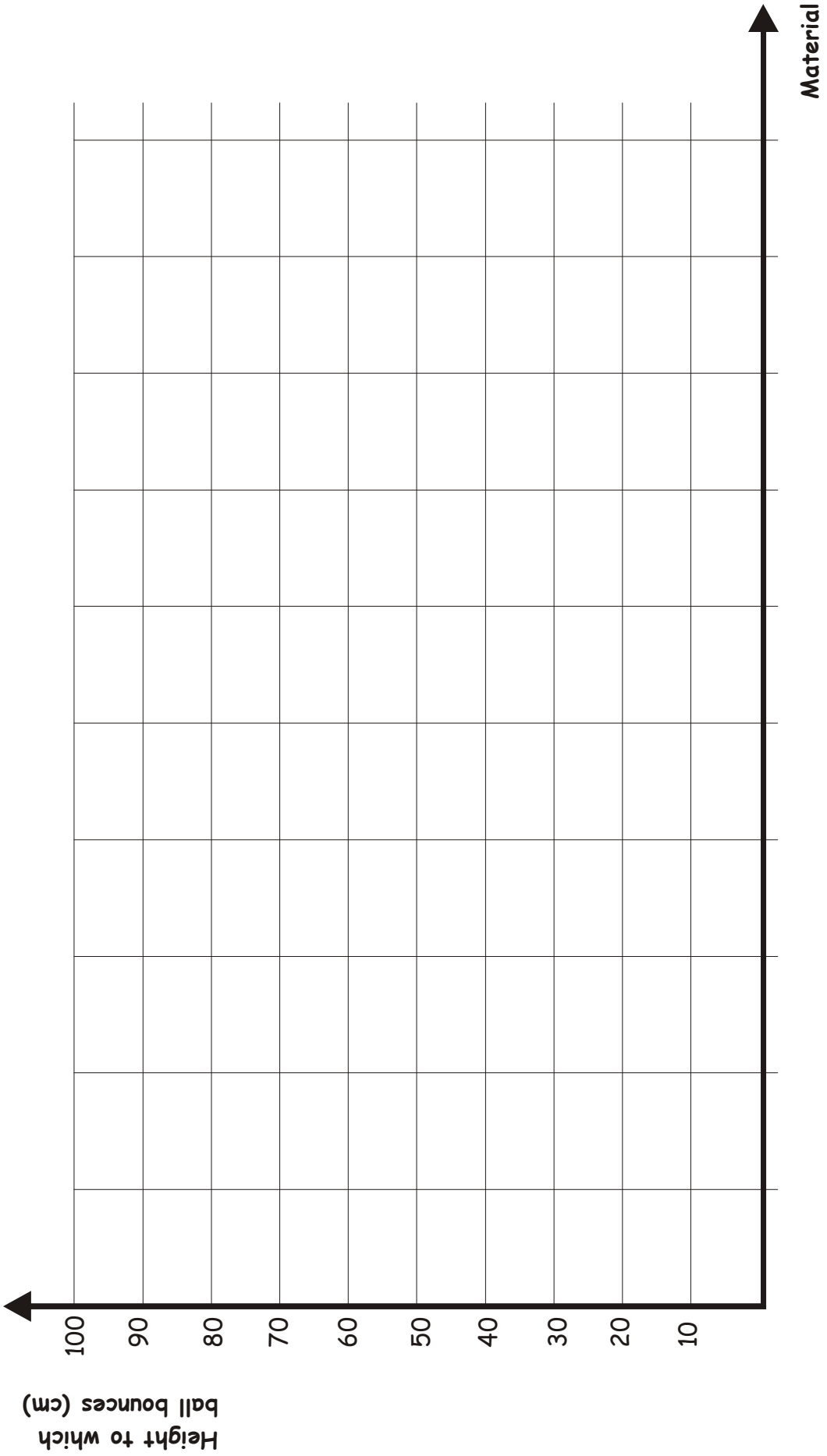
Floor material	Height to which the ball bounces (cm)

Represent your results in the form of a bar graph **(following page).**

Which material seems to be the hardest? .....

How did you decide? .....

3C6 How hard is your floor?

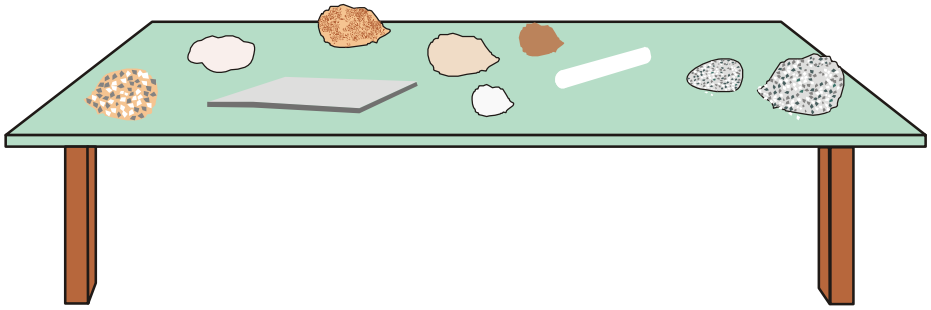


	3D Rocks And Soil
	Section 1: Looking at rocks
3D1	What is your school made of?
3D2	Can rocks float?
3D3	Colouring in granite
3D4	Paper mache volcano: part 1
3D5	Paper mache volcano: part 2
3D6	Paper mache volcano: part 3: The eruption
	Section 2: Grouping rocks
3D7	Grouping rocks: Preparation
3D8	Grouping rocks: texture and appearance
3D9	**Grouping rocks: hard or soft rock**
	Section 3: Erosion and permeability
3D10	Erosion of buildings
3D11	Breaking up rocks
3D12	Freeze-thaw weathering of sandstone
3D13	Permeability of some rocks
	Section 4: Using rocks
3D14	School photo survey
3D15	Comparing clay with brick
	Section 5: Rock is everywhere
3D16	Rock is everywhere
	Section 6: Different types of soil
3D17	Make some apparatus for soil testing
3D18	What is soil made of? Water I
3D19	What is soil made of? Water II
3D20	What is soil made of? Air I
3D21	What is soil made of? Air II
3D22	What is soil made of? Part 1
3D23	What is soil made of? Part 2
	Section 7: The permeability of soil
3D24	How easily does water filter through soil?

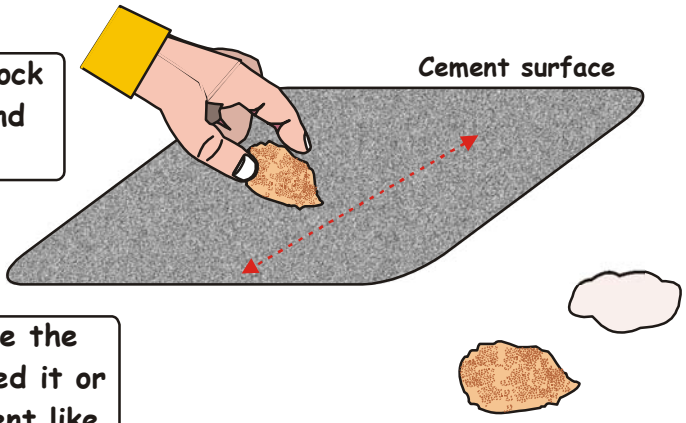
3D9 Grouping rocks: hard or soft rock

Collection of rocks of varying hardness (see below)☐ Cement surface ☐

① Your teacher has supplied you with a number of different rock samples. You are going to make a test to see how hard the rocks are.



② Go into the playground and rub a rock sample against a cement surface and examine the mark that it makes.



③ Note if the mark was made because the rocks sample broke up as you rubbed it or because the rock cut into the cement like a knife.

Put the rock samples in order of hardest to softest:

1..... 2..... 3..... 4..... 5.....

How did you decide whether one rock was harder or softer than another? .....

.....

.....

How did you make sure that you carried out a fair test?.....

.....

.....

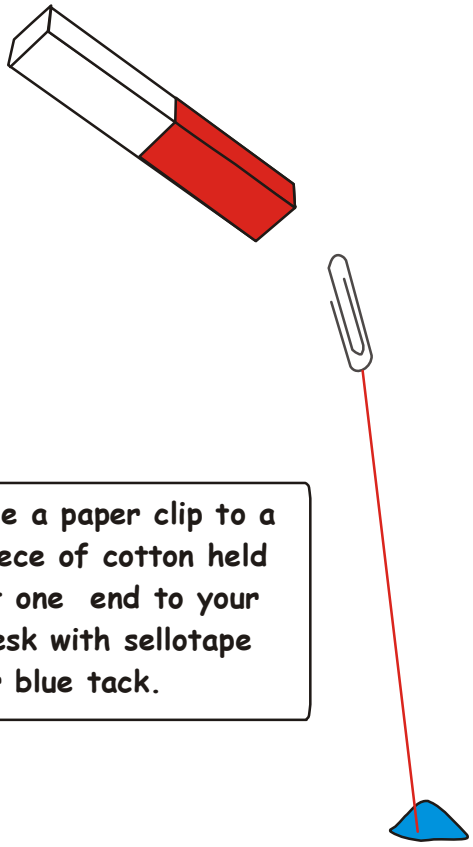
	3E Magnets And Springs
	Section 1: Introduction
3E1	Making statues
3E2	Photo survey: pushing or pulling?
	Section 2: Exploring magnets
3E3	The poles of a magnet
3E4	Pushing or pulling?
	Section 3: Finding magnetic materials
3E5	Survey of magnetic materials
3E6	Magnetic material for breakfast
	Section 4: Uses of magnets
3E7	Photo survey: uses of magnets
3E8	Magnetic fish
3E9	**Make a paperclip float**
3E10	How to build a compass I
3E11	How to build a compass II
	Section 5: Behaviour of magnets
3E12	Which magnet is strongest?
3E13	Floating magnets
	Section 6: Uses of springs
3E14	Photo survey: uses of springs
	Section 7: Compressing and stretching springs
3E15	Comparing springs I
3E16	Comparing springs II
	Section 8: Testing elastic bands
3E17	Comparing elastic bands
3E18	Make a toy car catapult
3E19	Test your toy car catapult
3E20	Make a plastic bottle paddle boat
3E21	Make a cotton reel racer
3E22	Make a come-back

3E9 Make a paperclip float

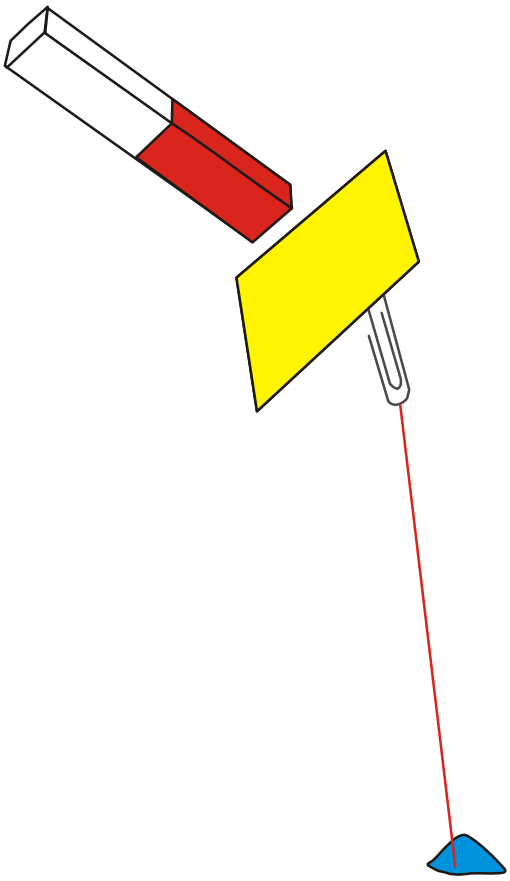
Card☐ Scissors☐ Paper clips☐ Bar magnet☐ Thread☐ Card☐ Sticky tack☐

① Tie a paper clip to a piece of cotton held at one end to your desk with sellotape or blue tack.

② Without letting the magnet touch the paper clip suspend it in the air as indicated below.



③ While the paper clip is suspended insert a piece of card between it and the magnet.



What holds the paper clip in the air, a pushing force or a pulling force? ……

Would this experiment work with a plastic paper clip? ……

Why not? ……

How does this experiment show you that magnetic forces can pass through non magnetic material?

……

……

……

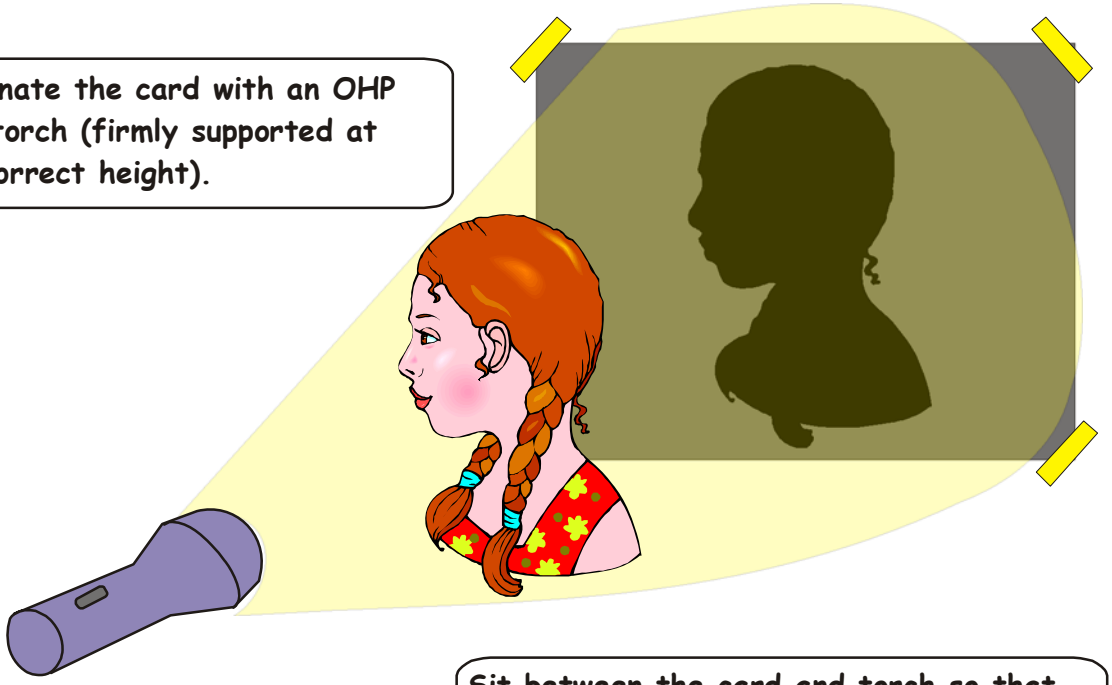
	3F Light and Shadow
	Section 1: Introduction
3F1	Photo survey: Words connected with light
3F2	Survey: Words connected with light
	Section 2: Making shadows
3F3	Blocking light
3F4	**Make a silhouette of yourself**
	Section 3: Sunlight and shadows
3F5	Chalking shadows
	Section 4: How shadows change through the day
3F6	Make a shadow stick and card
3F7	Measure the length of shadow during the day
	Section 5: Where does the sun shine?
3F8	Wandering star
	Section 6: Observing the position of the sun
3F9	Measuring shadows during the term
3F10	What causes shadows to change
	Section 7: Showing how the earth spins
3F11	Explaining shadows using a globe
	Section 8: Sundials
3F12	Make your own sundial
	Section 9: Light and different materials
3F13	Investigating shadows produced by different materials

3F4 Make a silhouette of yourself

Torch or OHP☐ Card☐ Sticky tape☐

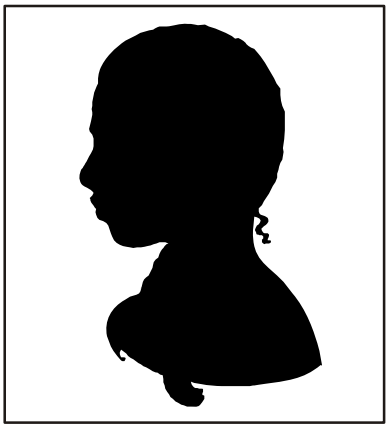
① Hold a piece of black A3 card to a wall or whiteboard using tape or sticky tack.

② Illuminate the card with an OHP or a torch (firmly supported at the correct height).



③ Sit between the card and torch so that a silhouette of your head appears on the black card. (you should be able to see the shadow even though the card is black!

④ Get a friend to draw carefully around the outline of your head and shoulders, then cut out around the outline of the silhouette and stick it on a white background.

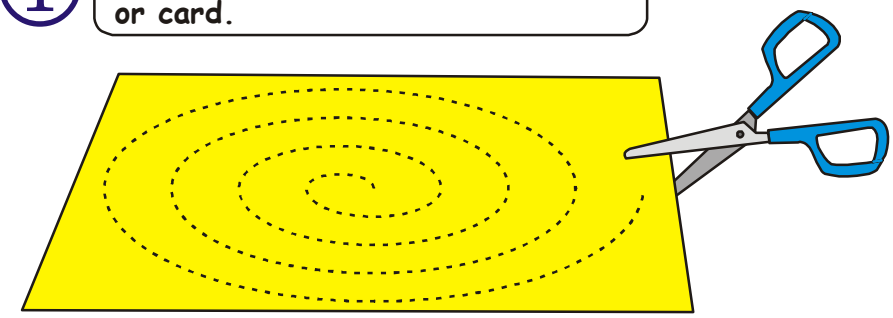


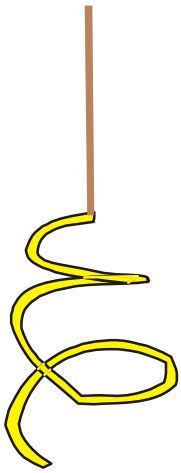
	4C Keeping Warm
	Section 1: Using touch to judge temperature
4C1	Measure the temperature
4C2	Guess the temperature
4C3	When its difficult to guess the temperature
4C4	Hot bowl - cold bowl
	Section 2: Using a thermometer
4C5	Thermometer readings in various situations
	Section 3: Recording temperatures
4C6	A temperature map of your classroom
4C7	A temperature map of your school grounds
4C8	Solar heater I
4C9	Solar heater II
	Section 4: Keeping things cold
4C10	Melting ice
4C11	Keeping cool in the Sun
	Section 5: Keeping things warm
4C12	Which cools fastest? I (volume)
4C13	Which cools fastest? II (surface area)
4C14	**How heat escapes: convection I**
4C15	How heat escapes from your body: convection II
4C16	How heat escapes from your body: evaporation
4C17	How heat moves in a liquid
4C18	Make a volcano
4C19	How heat escapes: conduction
	Section 6: Insulation
4C20	Insulation and cooling
	Section 7: Insulators and conductors
4C21	Wooden, plastic and metal spoons
4C22	Insulators and conductors
	Section 8: Uses of thermal insulators
4C23	Photo survey: thermal insulators

4C14 How heat escapes: convection I

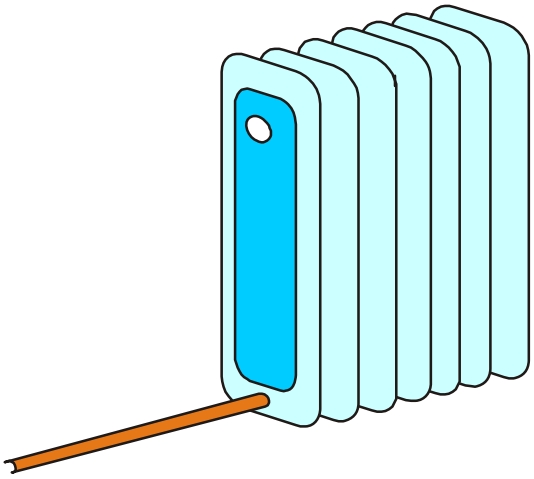
Card☐ Scissors☐ String☐ Sticky tack☐ Heat source☐

① Cut a spiral from a piece of paper or card.





② Hang it above a heat source as indicated opposite and observe what happens.



What does the mobile do when you hang it above the radiator? ……

……

This happens because warm air is moving.

Where does the warm air come from? ……

……

In which direction does warm air move, upwards or downwards? ……

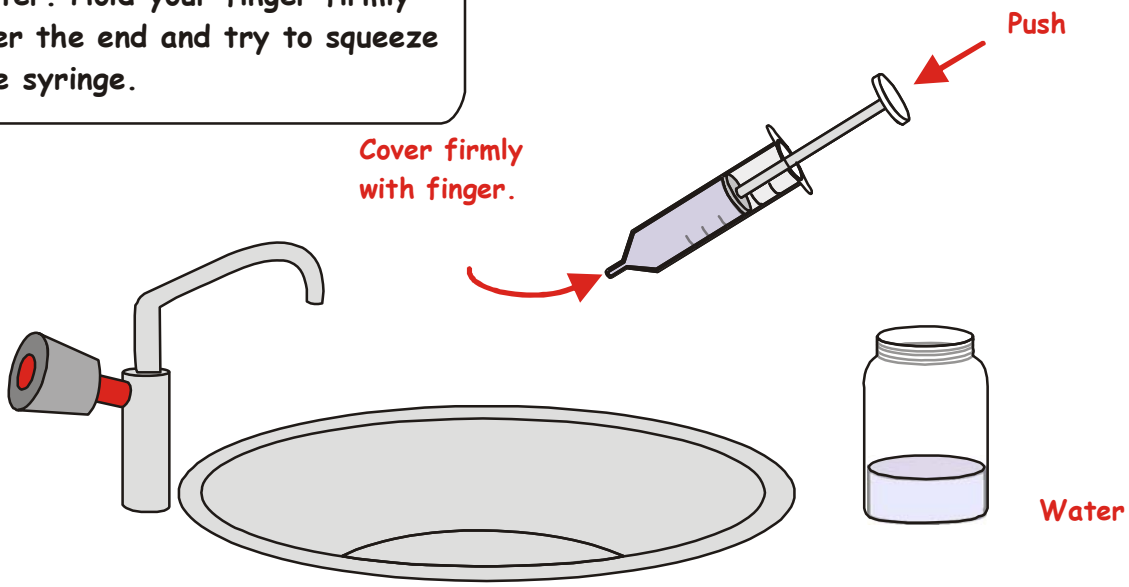
	4D Solids And Liquids
	Section 1: Introduction
4D1	Grouping solids: spider diagram
	Section 2: Sorting liquids from solids
4D2	Sorting liquids
4D3	Confusing materials
4D4	Fluidity of liquids
4D5	The shape of a liquid
4D6	Tilting liquids
4D7	Volume of liquids
4D8	**Changing the volume of a liquid and a solid**
4D9	Pouring liquids (part 1)
4D10	Pouring liquids (part 2)
4D11	Siphoning liquids
	Section 3: Measuring volume
4D12	How much liquid will a container hold?
4D13	Measuring volume by displacement
4D14	Measure your lung capacity
4D15	Measure the volume of a drop of water
4D16	Make a displacement vessel
4D17	Using a displacement vessel
	Section 4: Pouring solids
4D18	Investigating dry sand
4D19	Investigating wet sand
	Section 5: Freezing and melting
4D20	Freezing water
4D21	Melting chocolate
4D22	Icebergs: part 1
4D23	Icebergs: part 2
	Section 6: Melting temperatures
4D24	Melting point of ice
4D25	Adding salt to ice
4D26	Melting point of chocolate
	Section 7: Mixing solids
4D27	Separating marbles, sand, rice and paper clips
4D28	Separating iron filings and sand
4D29	Separating sand from salt?

	Section 8: Adding solids to water
4D30	Soluble or insoluble?
4D31	Adding salt to water
4D32	Adding sand to water
	Section 9: Separating solids and water
4D33	Separating salt from water
4D34	Separating pigments in ink
	Section 10: Making solutions
4D35	Speeding up dissolving: temperature
4D36	Speeding up dissolving: powder and stirring

4D8 Changing the volume of a liquid and a solid

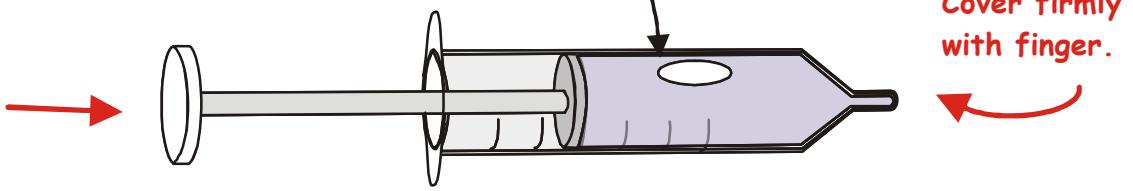
Syringe☐ Jam jar or plastic cup☐ Sink☐

① Two thirds fill a syringe with water. Hold your finger firmly over the end and try to squeeze the syringe.



② Pull the handle back a little allowing a small air bubble to enter the chamber.

③ Hold the syringe horizontally so that the bubble is positioned in the middle, then compress and observe what happens to the bubble.



Is it easy to change the volume of a liquid?.....

.....

How does the experiment in part two and three above show you that gases are easier to compress than liquids?

.....

.....

.....

Why are bicycle tyres filled with air and not water? .....

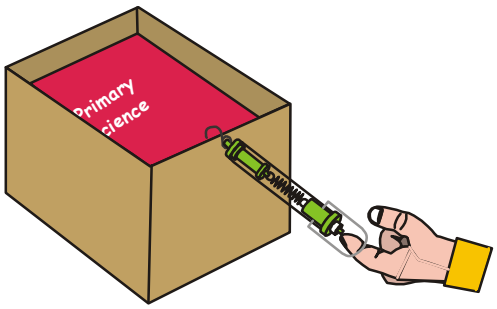
.....

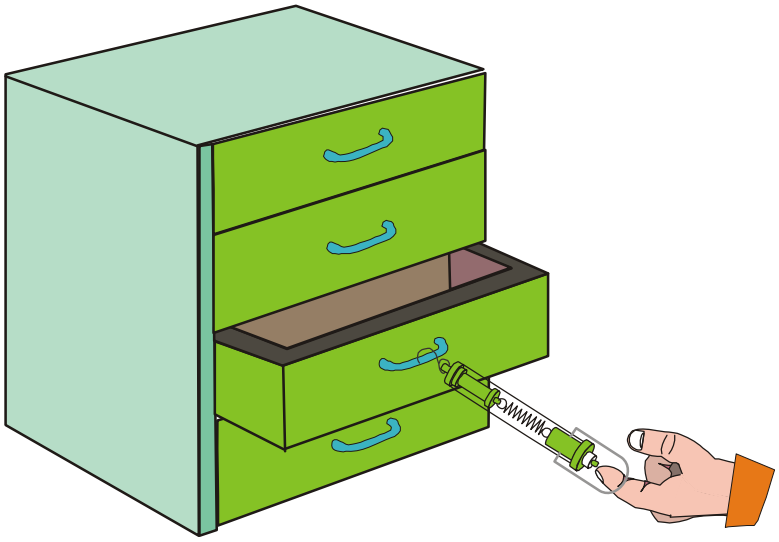
	4E Friction
	Section 1: Introduction
4E1	Review of forces
	Section 2: Measuring force
4E2	Force meters
4E3	**Using force meters**
4E4	Measuring forces: weight
4E5	Measuring forces: the elastic force
	Section 3: Sliding objects
4E6	Types of force: friction
4E7	Friction produces heat
4E8	Comparing friction between surfaces
4E9	Spinning objects
4E10	Why use wheels?
	Section 4: Using friction
4E11	High or low friction
4E12	A knot race
4E13	Investigating old shoes
4E14	Friction and structures
	Section 5: Water resistance
4E15	Water resistance
	Section 6: Air resistance
4E16	Running with a cardboard
4E17	Making mini kites
4E18	Investigating air resistance I
4E19	Investigating air resistance II
4E20	Jet propulsion
4E21	Make a straw plane
	Section 7: Investigating parachutes
4E22	Build a parachute
4E23	Investigating parachutes

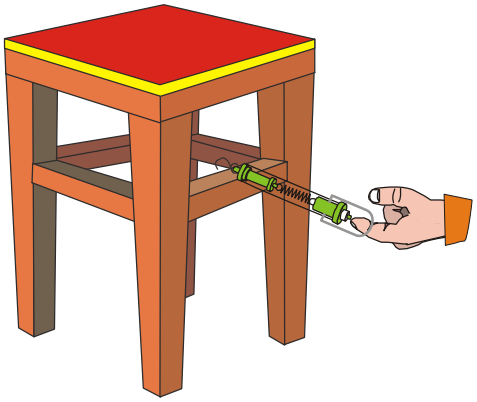
4E3 Using force metres

Collection of force meters☐ Collection of items or devices that can be pushed or pulled☐

Use your force metre to measure the forces required in the various situations listed below.







Your teacher has provided you with a number of situations in which you have to apply a force. In each case decide which force metre is appropriate then measure the force required. Note your measurements in the table below:

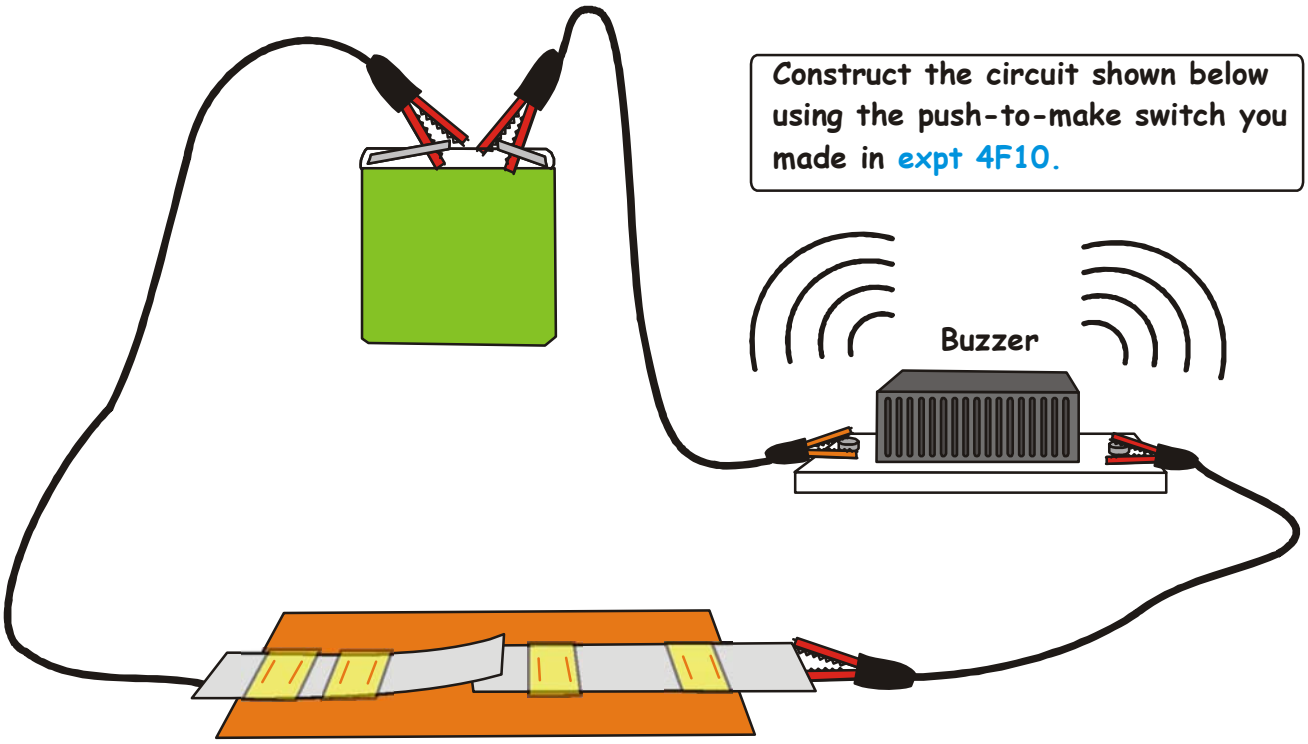
Situation	Force required
Open a drawer	
Pull down a door handle	
Drag a chair across the floor	

Represent your information on a histogram.

	4F Circuits And Conductors
	Section 1: Making circuits that work
4F1	Draw it—make it
	Section 2: Mains and battery-powered circuits
4F2	Photo survey: mains or battery
4F3	Light up an led
4F4	Different types of batteries
4F5	Match the battery!
	Section 3: Conducting electricity
4F6	Inserting devices into a circuit I
4F7	Inserting devices into a circuit II
	Section 4: Conducting and insulating materials
4F8	Conductors and insulators
4F9	Solutions can conduct
	Section 5: Switches
4F10	Build a "push to make" switch
4F11	Make a circuit with a push-to-make switch
4F12	**Make a Morse code generator**
	Section 6: Adding batteries
4F13	Adding batteries to a light bulb
4F14	Adding batteries to a motor (and changing the poles)
	Section 7: Changing circuits
4F15	Increase the number of bulbs series
4F16	Change the type of battery

4F12 Make a Morse code generator

Cables☐ Battery☐ Push-to-make switch (previous expt)☐ Buzzer☐



Now use the code below to send messages to your partner:

A	.-	N	-.	0	-----
B	-...	O	---	1	.----
C	-.-.	P	.--.	2	..---
D	-..	Q	--.-	3	...--
E	.	R	.-.	4	....-
F	..-.	S	...	5	.....
G	--.	T	-	6	-....
H	....	U	..-	7	--...
I	..	V	...-	8	---..
J	.---	W	.--	9	----.
K	-.-	X	-..-	Full stop	.-.-.-
L	.-..	Y	-.--	Comma	--..--
M	--	Z	--..	Query	..--..

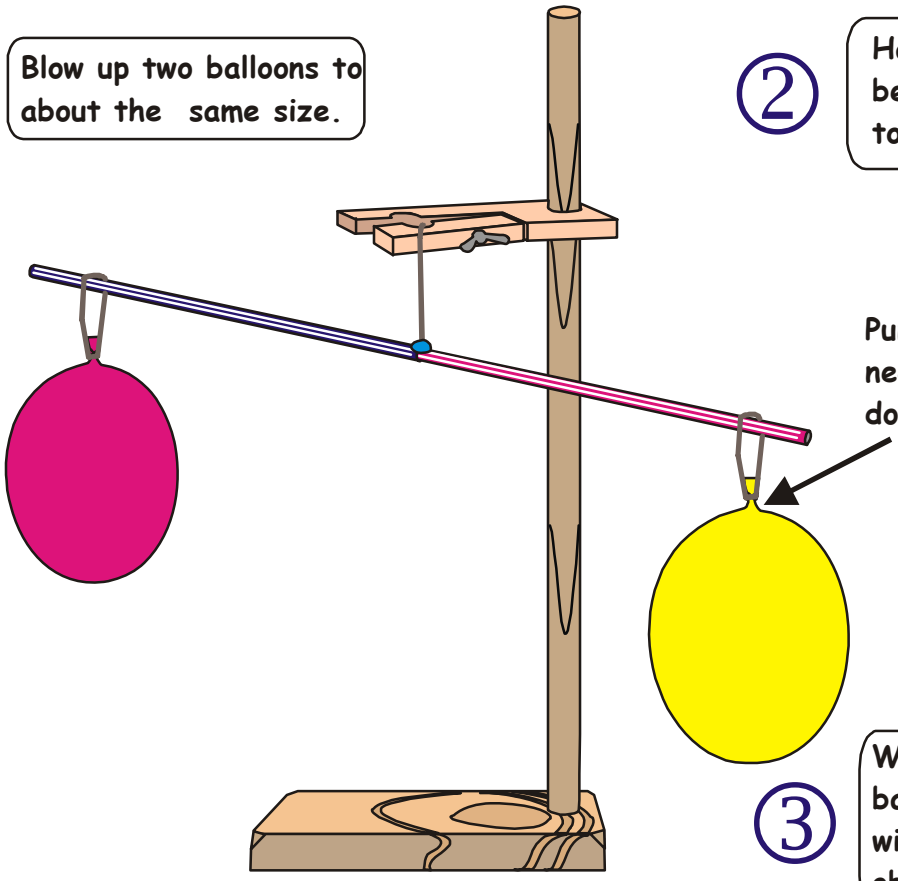
	5C Gases Around Us
	Section 1: Grouping solids and liquids
5C1	Grouping solids and liquids (spider diagram)
	Section 2: Understanding air
5C2	The mass of air in a football
5C3	**Demonstration that air has a weight**
5C4	The weight of the air in your classroom
5C5	Air pressure: keep the water in the cup
5C6	Air pressure: keep the tissue dry
5C7	Air pressure: keep the water in the jar
5C8	Air pressure: karate!
5C9	Air pressure: remove the air from a bottle
5C10	How to make a syringe pump
5C11	How to make a suction pump
5C12	Air pressure: how to make a barometer
	Sections 3 and 4: Thinking about powders and sponges
5C13	Powders contain air
5C14	How much air is there in sand?
5C15	How much air is there in a sponge?
	Section 5: Air in soil
5C16	What is soil made of? (part I)
5C17	What is soil made of? (part II)
	Section 6: Important gases
5C18	Gases of the atmosphere (photo survey)
5C19	How much Oxygen is in the atmosphere I?
5C20	How much Oxygen is in the atmosphere II?
5C21	Eggstraordinary
5C22	Preparation of limewater
5C23	Properties of Carbon Dioxide (fire extinguisher)
5C24	Which gases do we breath out?
5C25	Investigating fizzy drink bottles I
5C26	Investigating fizzy drink bottles II
5C27	Raising raisins
5C28	Helium balloons
	Section 7: Evaporation **(see unit 5D: changing state)**
	Section 8: Properties of gases
5C29	Gases can move from place to place
5C30	The effect of heat on a gas
5C31	Crushing a milk container
5C32	Changing the volume of a gas
	Section 9: Differences between gases, solids and liquids
5C33	Venn diagram: solids liquids and gases

5C3 Demonstration that air has a weight

Plastic straws☐ Sticky tack☐ Support stand☐ Thread☐ Two balloons☐

① Blow up two balloons to about the same size.

② Hang the balloons from the beam adjusting the position to balance them correctly.



Puncture the balloon in the neck so that it deflates but does not explode.

③ When they are perfectly balanced burst one balloon with a drawing pin and observe what happens.

What happens to the balance when the balloon bursts?……

……

What does the experiment tell you about air?……

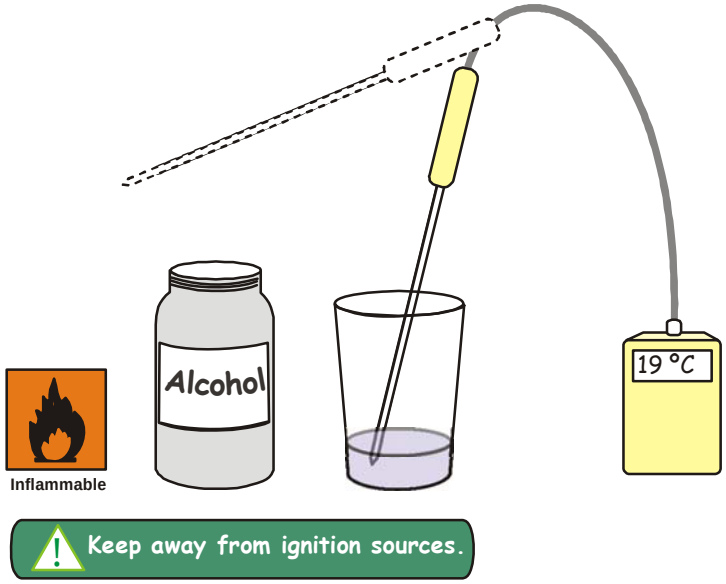
……

	5D Changing State
	Section 1: Introduction
5D1	Concept map
	Section 2: Water evaporation
5D2	Evaporation from your hand
5D3	**Evaporation from a thermometer**
	Section 3: Evaporation of other liquids
5D4	Evaporation of different substances
	Section 4 and 5: Planning to investigate evaporation
5D5	How heat effects evaporation
5D6	How surface area effects evaporation
	Section 6: Drying and evaporation
5D7	Investigating drying: surface area
5D8	Investigating drying: location
5D9	Chalking puddles
	Section 7: Condensation
5D10	Condensation I
5D11	Condensation II
5D12	How to make clouds
	Section 8: Finding condensation
5D13	Photo survey: finding condensation
	Section 9: Boiling
5D14	Boiling point of water (teacher demo) (using a kettle)
	Section 10: Observing melting
5D15	Melting ice
5D16	Adding salt to ice
5D17	Melting chocolate
	Section 11: Reversible changes of state
5D18	Photo survey: reversible and irreversible processes
5D19	Heating and cooling Tin
	Section 12: The water cycle
5D20	The water cycle

5D3 Evaporation from a thermometer

Digital thermometer☐ Plastic cup☐ Alcohol or surgical spirit☐

Take a probe thermometer and place it in a beaker of alcohol. Then remove it and observe the temperature readings.



What is the name of the physical process that occurs in this experiment?……

What change of state occurs?

…… → ……

Write your results in the table below:

Substance	Temperature change
Water	
Alcohol	

Which substance evaporated fastest?

Substances need heat in order to evaporate.

Where do the alcohol and water get the heat from?……

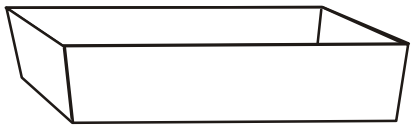
……

	5E Earth, Sun And Moon
	Section 1: Introduction
5E1	Star, planet or satellite?
	Section 2: Flat or spherical?
5E2	Ship on the horizon
5E3	Is the horizon flat or curved?
	Section 3: Size and distance
5E4	Photos of the Earth, Sun and Moon
5E5	Diameter of the Sun, Earth and Moon
5E6	How far away is the Sun?
5E7	Perspective
5E8	**Make a Paper mache Moon**
5E9	Make a space shuttle
5E10	Earth - Moon distance I
5E11	Earth - Moon distance II
	Section 4: The changing position of the Sun
5E12	Length and position of a shadow stick
5E13	The passage of the Sun: in London on 21st June
5E14	Which is moving the Sun or the Earth
	Section 5: The movement of the Earth
5E15	What is a day?
	Section 6: The Sun at different times of the year
5E16	Sunset and sunrise at different times of the year
	Section 7: The Earth's orbit
5E17	What is a year?
	Section 8: The Moon's orbit
5E18	What is a month?
5E19	The Moon dance
5E20	Phases of the Moon
5E21	Word soup

5E8 Make a Paper mache Moon

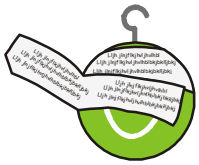
Plastic container☐ Paper ☐ PVA glue☐ Hook☐ Paintbrush and paint☐ Old tennis ball or plastic ball☐

① Find a ball (small plastic or old tennis) that is about 4 x smaller than your classroom globe. (Precise, 3.66 x smaller)

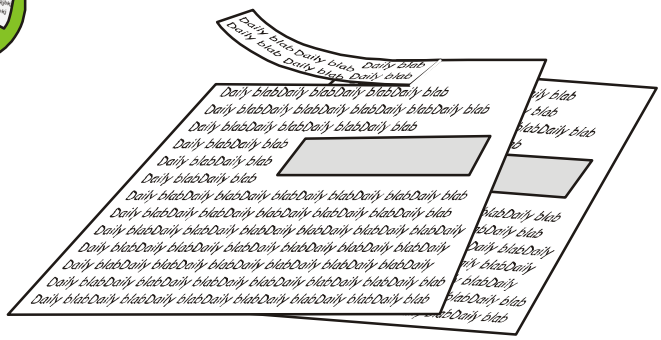


② Screw a small hook or eyelet into the ball and secure with appropriate glue.

③ Make a mixture of white PVA glue and water in a large margarine tub.

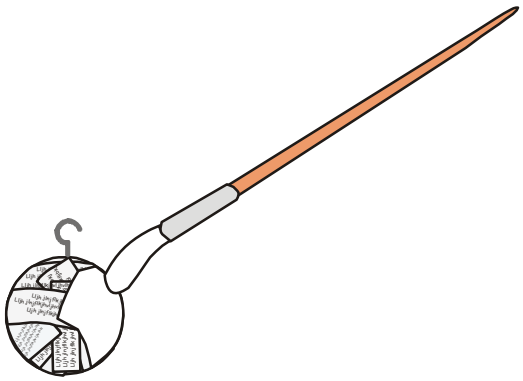


④ Now soak strips of paper in the mixture and stick them to the ball. Try to produce a crinkly effect on the surface to represent mountains and craters.



⑤ When the paper mache has set paint the Moon white and allow it to dry.

Attach a string and you are now ready to hang your Moon. (See expt. 5E9)



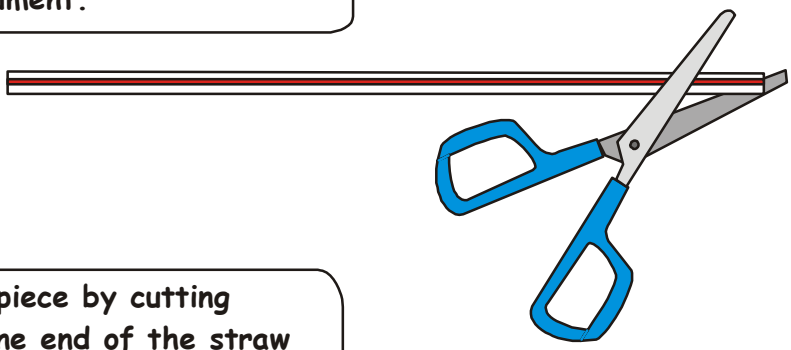
	5F Changing Sounds
	Section 1: Introduction
5F1	The orchestra — loudness and pitch
	Section 2: Observing how sound is made
5F2	Photo survey: Plucking, hitting or blowing
5F3	**Musical straws**
5F4	Make a kazoo
5F5	Feeling vibrations: the Cymbal
5F6	Speaker vibrations
	Section 3: Vibrations and sound
5F7	Vibrations of a spring: Length
5F8	Vibrations of a spring: Mass
5F9	Vibrations : tuning forks I
5F10	Vibrations : tuning forks II
5F11	Vibrations in a ruler
5F12	Make a wine glass vibrate
	Section 4: How sound travels
5F13	How sound travels through the air
5F14	Make a megaphone/hearing aid
5F15	Transmitting sounds along a tube
5F16	Echoes
5F17	How sound travels in a liquid
5F18	Transmitting sounds along a string
5F19	Sound in solids
5F20	Morse code using radiators
	Section 5: Preventing sound travelling
5F21	Ear protectors
	Section 6: Testing how to muffle sound
5F22	Absorption of sound
5F23	Muffling sound
	Section 8: Describing sounds
5F24	Everyday sounds
5F25	Sirens
	Section 9: Changing sounds
5F26	Make a drum set
5F27	Percussion instruments: musical bottles
5F28	Make a rain stick
	Section 10: Pitch in stringed instruments
5F29	Examining guitars
5F30	Make a guitar

	Section 11: Pitch in wind instruments
5F31	Make a didgeree doo
5F32	Pan pipes using straws
5F33	Pan pipes: using plastic overflow piping
5F34	Musical bottles

5F3 Musical straws

Plastic straw☐ ☐ Scissors☐

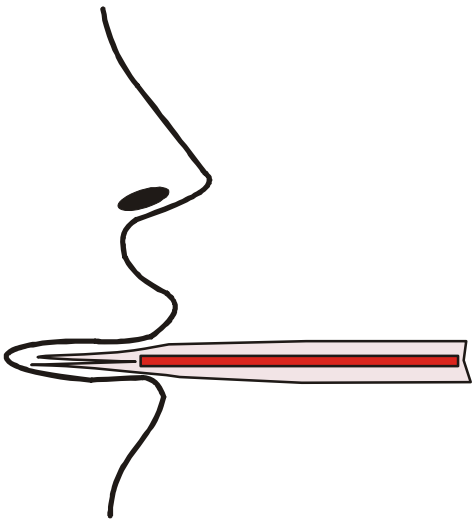
You are going to turn a straw into a musical instrument.



① Make a mouth piece by cutting a V shape at one end of the straw as indicated opposite.

Repeat with various lengths of straw.

② Insert the straw in your mouth, pressing with your lips as indicated opposite, so that the tips of the straw are just separated.



③ Blow so that you get the tips of the straw to vibrate.

Repeat with straws of different lengths and compare their sounds.

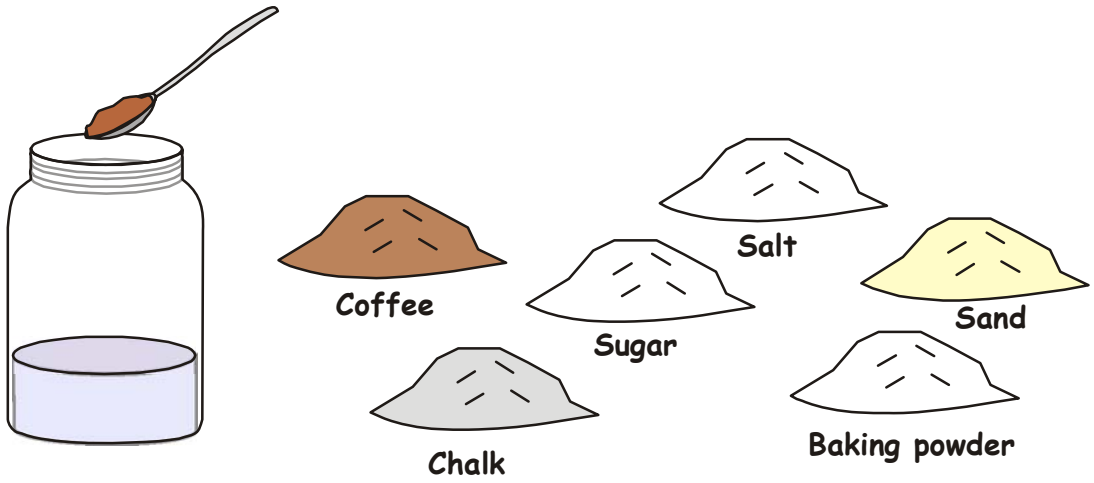
	6C More About Dissolving
	Section 1: Making water clear
6C1	Make a pebble bed filter
6C2	Filtering dirty water using a filter bed
6C3	How to fold filter paper
6C4	Filtering dirty water using different filters
6C5	What's in water? (bits)
	Section 2: Making water pure
6C6	Is clear water pure water?
6C7	Is the liquid pure?
6C8	Water dissolves gases
	Section 3: Testing evaporation of a solution
6C9	Distillation of salt water
	Section 4 and 5: Testing dissolving solids
6C10	**Which substances dissolve in water?**
6C11	Dissolving solids I: temperature
6C12	Dissolving solids II: grain size
6C13	Dissolving solids III: stirring
6C14	Dye solutions
6C15	Tie dyeing: preparing the solution for dyeing
6C16	Tie dyeing: dyeing a tee-shirt
6C17	How to write a secret message

6C10 Which substances dissolve in water?

Plastic cup☐ Teaspoon☐ Selection of substances (see below)☐

① Your teacher has provided you with a number of common substances. You must decide which dissolve in water and which don´t.

② In each case add a spoonful of the substance to water and stir for a while. Then, note below if the substance is still visible or not.



How do you decide if something dissolves or not? ……

……

Fill in the table below:

Substance	Visible after stirring?	Dissolves easily	Does not dissolve
Salt			
Sugar			
Chalk			
Sand			
Coffee			

Insert the words **soluble** or **insoluble** to complete the sentences below:

If a substance dissolves in water it is said to be ……

If a substance does not dissolve in water it is said to be ……

Salt is …… in water whereas sand is……

	6D Reversible And Irreversible Changes
	Section 1: Mixing materials with water
6D1	Survey: Mixing various substances with water
	Reversible changes
6D2	Mixing ink with water
6D3	Mixing oil with water
6D4	Mixing oil with surgical spirit
6D5	Mixing and separating salt and sand
6D6	Make an indicator from red cabbage
6D7	Using your indicator (reversing the colour)
	Irreversible changes
6D8	**Alka Seltzer ® bomb**
6D9	Alka Seltzer ® rocket
6D10	Chemical reactions: Effervescence
6D11	Chemical reactions: Heat change
	Section 2: Filtration and evaporation
6D12	Separating oil from water
6D13	Separation of salt from rock salt
	Section 3: Making new materials
6D14	Make some Plaster of Paris Christmas decorations
6D15	Make a fossil leaf
6D16	How to make green slime
6D17	Cleaning old coins
6D18	How to make a lava lamp
6D19	Mixing vinegar with baking powder
6D20	Make a volcano
6D21	Make your volcano erupt
6D22	Chemical reactions: Colour changes
6D23	Dissolving an egg shell
6D24	Acids are corrosive
6D25	Chemical reactions: Effervescence tablets
6D26	How to make tooth paste

	Section 4: Heating and cooling materials
6D27	Melting Tin to make badges
6D28	Heating a bimetallic strip
6D29	Comparing heating and burning
6D30	Make some floating candles
6D31	How to make charcoal (a home experiment)
6D32	How to make fossilised fir cones
	Section 5: Burning
6D33	Photo survey: fuels
6D34	What is wood ash?
6D35	Burning requires Oxygen
6D36	Video: exploding custard
6D37	Burning steel wool
6D38	Burning Magnesium
6D39	Burning peanuts
6D40	Review: Crossword puzzle

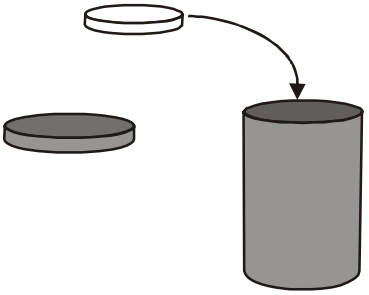
6D8 Alka Seltzer ® bomb

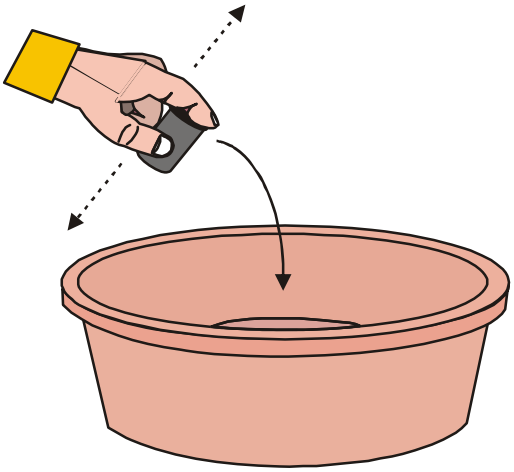
Effervescent tablet☐ Camera case☐

For this activity you need to use a film cartridge. There are usually two types: one where the lid fits over the case another where the lid fits into the case. You need the second type.

① Nearly fill a film case with water then add an Alka Seltzer tablet.

② QUICKLY secure the lid and shake vigorously for a few seconds.





③ Place the film case in a sink or a washing up bowl and observe what happens.

Describe what happens in the experiment: ……

……

……

Why does the lid fly off ?……

……

A chemical reaction takes place in this experiment. What is the name of the gas produced?

……

(see experiment 6D10.)

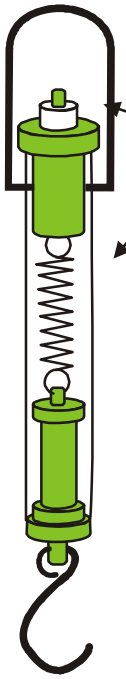
	6E Forces In Action
	Section 1: introduction
6E1	Force meters
6E2	Build a force meter
	Section 2: Gravity and weight
6E3	**Choosing the correct force meter for the job**
6E4	Which way does the rain fall?
6E5	Gravity and falling objects
6E6	Hammer and feather experiment
6E7	Make a water balance
6E8	Weigh things with your water balance
	Section 3: Showing how forces act on objects
6E9	The four effects of a force
6E10	Survey of forces
6E11	Photo survey: Pushing and pulling
6E12	Forces in structures
6E13	Eggstremely strong
6E14	How to spot a hard boiled egg
6E15	Surface tension
6E16	Magic boats
6E17	Floating rice cereals on water
6E18	Hero's engine
6E19	Make a hovercraft
6E20	Uplift: how an aeroplane wing works
6E21	Build a paper aeroplane
6E22	Floating ping pong balls
6E23	Blow the balloons a part
6E24	How to isolate charges
6E25	Deflection of a jet of water
6E26	Attraction of a cereal flake
	Section 4: Weighing in air and water
6E27	The weight of an object in water
6E28	Measuring the up thrust using a balance
6E29	Floating: when forces are balanced
6E30	Cartesian diver
6E31	Investigating Cartesian divers
6E32	Salt water or pure water?

	Section 6: Stretching elastic bands
6E33	Measure the tension in elastic bands
	Section 7: Explaining how paper falls
6E34	Investigating air resistance I
	Section 8: Investigating air resistance
6E35	Investigating air resistance II
6E36	Rocket balloons
6E37	Making spinners

6E3 Choosing the correct force metre for the job

Collection of force meters☐ Objects to lift (see below)☐

① Calibrate the force metre.

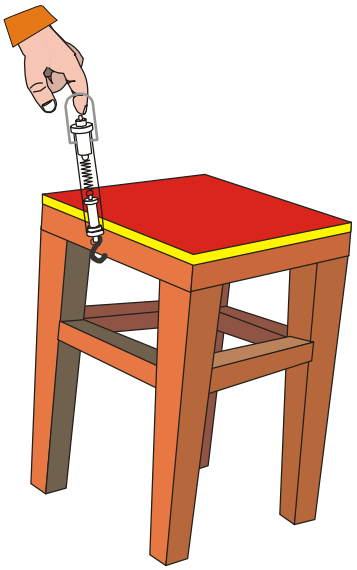


Adjust the knob until the indicator corresponds to ON

Remove any weights

② Measure the weight of the objects supplied by your teacher and note down in the table below.

Make sure you chose the correct colour force metre for each object.



Write your results in the table below:

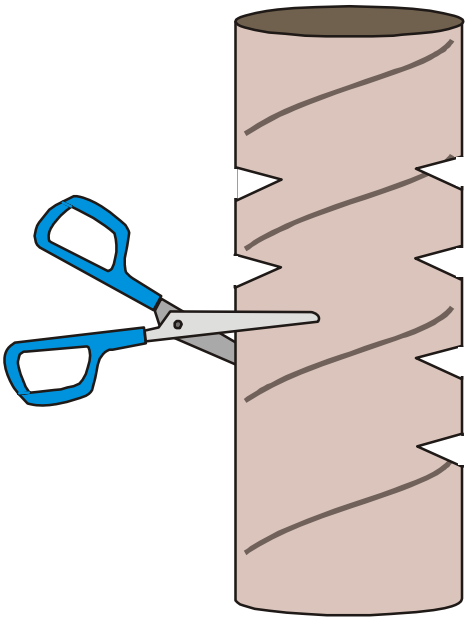
Object	Colour of the force metre	Weight
Stool		
Scissors		

	6F How We See Things
	Section 1: Introduction
6F1	Reflective or luminous?
	Section 2: How light travels
6F2	Light travels in straight lines
	Section 3: How we see light
6F3	Watch your pupils!
6F4	Diffusion of light
	Section 4: Exploring mirrors
6F5	Investigating mirrors
6F6	Make a beam of light move around the classroom
	Section 5: Beams of light
6F7	How to make a beam of light
6F8	**Make a magic lantern**
6F9	Coloured beams from a CD ROM
	Section 6: Reflection from surfaces
6F10	How to make coloured filter paper
6F11	Reflecting colours
6F12	Why are things coloured?
6F13	Investigating the colours in light
6F14	Reflecting from shiny and diffusing surfaces
6F15	Reflecting light from a yoghurt carton
6F16	Spinning top
	Section 7: Shadows and reflections
6F17	Investigating shadows
6F18	Make a mini silhouette theatre
6F19	Build a viewing screen
6F20	Improving light patterns using tracing paper
	A few tricks of the light
6F21	How to make a pin hole camera
6F22	Viewing a pinhole camera image
6F23	Project an image of your classroom window
6F24	Make the spot disappear
6F25	Put the bird in the cage
6F26	A pencil trick
6F27	Make a coin disappear

6F8 Make a magic lantern

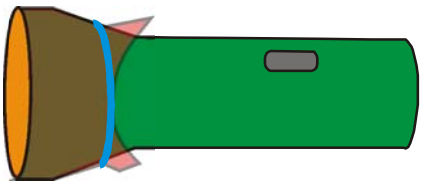
Kitchen towel roll ☐ Scissors ☐ Coloured transparent paper ☐ Rubber band ☐ Small torch ☐

① Flatten a long cardboard roll. The type used for kitchen cleaning towels is best.

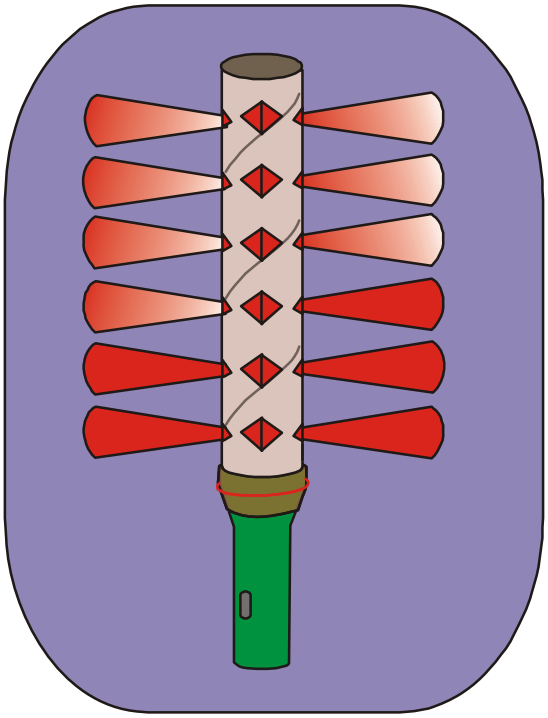


② Cut geometrical shapes out at the edge as indicated opposite.

③ Hold a piece of coloured transparency paper over the end of a torch using an elastic band.



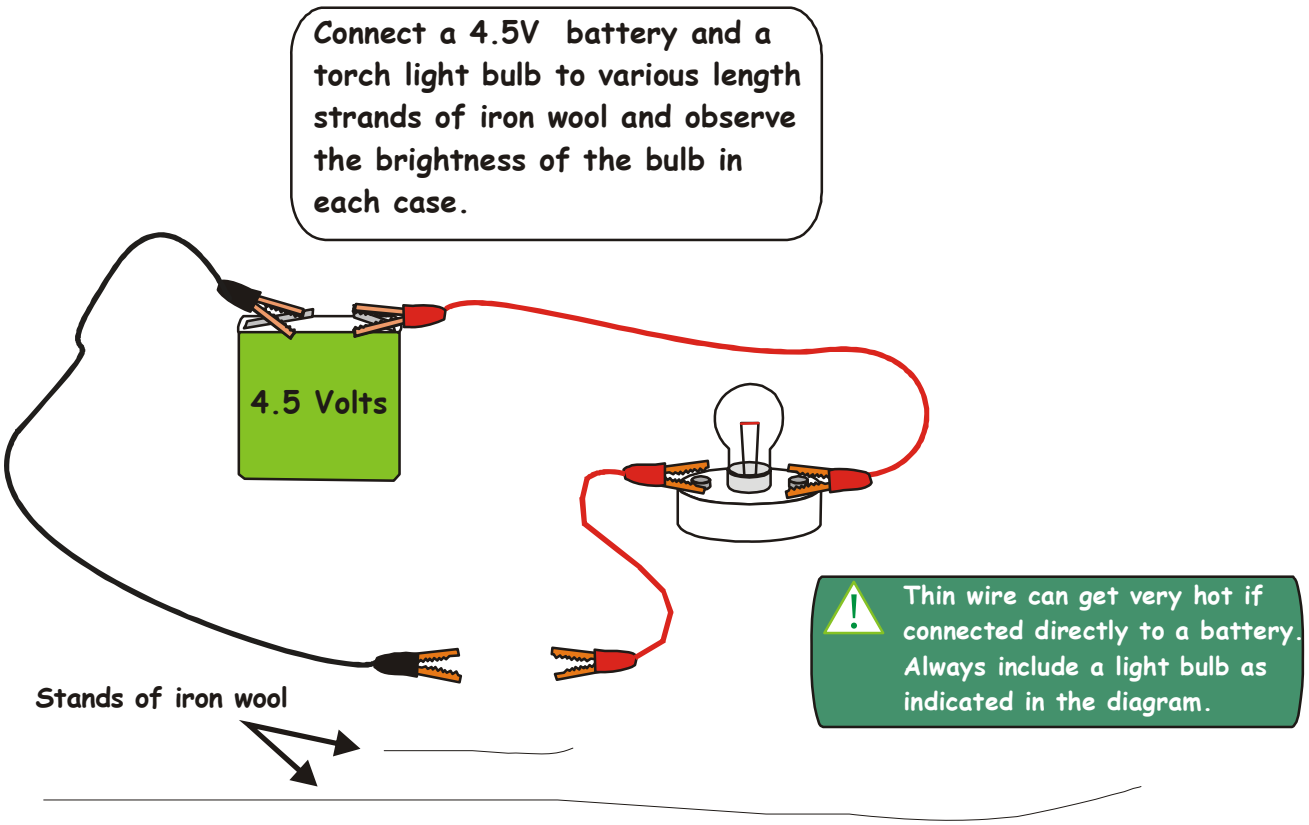
④ Make your magic lantern by holding the torch under the kitchen towel roll as indicated opposite.



	6G Changing Circuits
	Section 1: Changing circuits
6G1	Mains or battery?
6G2	Connecting light bulbs to batteries
6G3	Changing the voltage in a motor
	Section 2: Drawing circuits with symbols
6G4	Which symbols?
6G5	Make a quiz board
6G6	Electric game 1
6G7	Electric game 2
6G8	Hall light switch
6G9	Bedside lamp
6G10	Clothes peg switch
	Section 3: Testing circuits
6G11	Find the fault
6G12	**Bulb brightness and length of wire**
6G13	Bulb brightness and thickness of wire
6G14	Bulb brightness and type of wire
	Section 4: Investigating circuits
6G15	Build a pencil lead potentiometer
6G16	Electricity produces heat I
6G17	Electricity produces heat II

6G12 Bulb brightness and length of wire

6V torch light bulb x2☐ Cables and clips☐ Battery 4.5V☐ Light bulb 6V☐ Strands of iron wool of different length☐



Note what happens to the bulb brightness in the table below:

Sample	Bulb brightness
Short strand	
Medium strand	
Long strand	

How does the length of the wire effect the brightness of the bulb? ……

……

……

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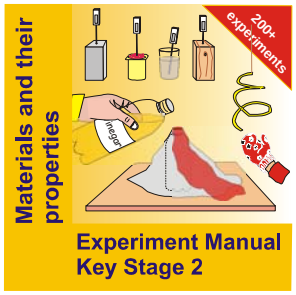

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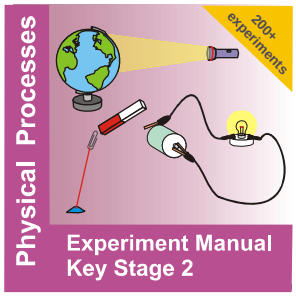

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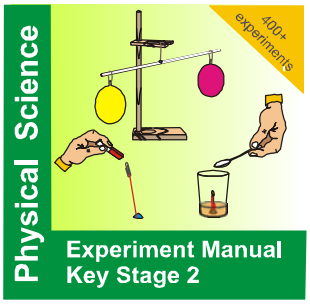

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