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ABSTRACT

This pack of resource materials is designed for students in Scotland, ages 5-7, to be done with their parents at home or with another student in school. Forty-five activity sheets cover 7 different areas of science: Air, Magnets, Moving Things, Light, Heat, Myself and Water. The pack also includes a leaflet for parent or peer tutors, lists of simple equipment easily found at home and school, record cards, practical suggestion on evaluation and an evaluation questionnaire. (PR)

PAIRED SCIENCE

a resource pack for parents and children

by

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PAIRED SCIENCE

a resource pack

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This pack of resource materials makes it easy to set up a project to help children aged 5 to 7 years with National Curriculum science activities.

Many schools will encourage parents to help children with these activities at home. Alternatively, older children could act as peer tutors in school, - improving the science understanding of both members of the pair!

The Activity Sheets include scientific "keywords" - a framework to help helpers discuss the activity in the most productive way.

Forty-five Activity Sheets cover 7 different areas of science: Air, Magnets, Moving Things, Light, Heat, Myself and Water. The Pack also includes a leaflet for parent or peer tutors, lists of simple equipment easily found at home and school, record cards, practical suggestions on evaluation and an evaluation questionnaire. There are 108 printing masters to reproduce as much as you need for one school.

The Paired Science Pack costs £25 (plus £2.50 carriage in the U.K., £7.50 overseas).

It is supplied only on a cash-with-order basis (no invoicing or charge cards).

For overseas orders, convert the total cost of your order into your own currency at the current exchange rate and send a cheque in your own currency.

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Please send me __ Paired Science Pack(s).
I enclose a cheque made payable to "The Centre for Paired Learning" for ________

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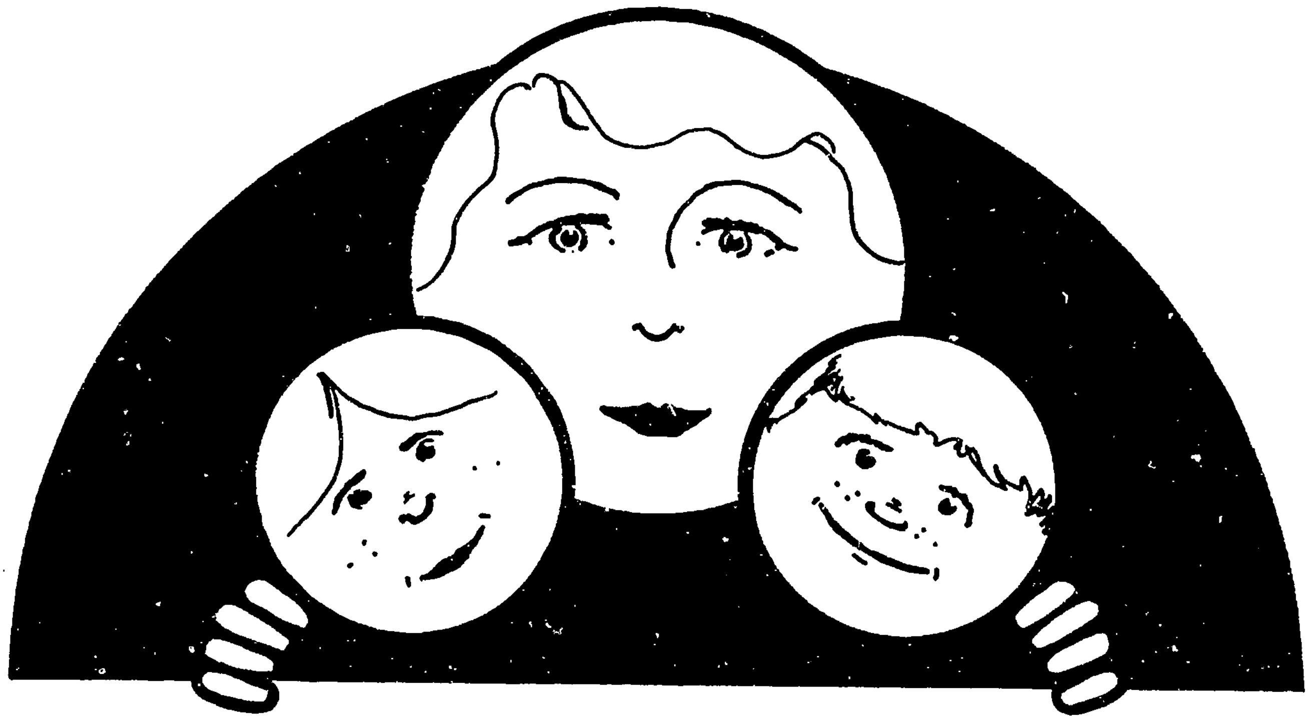
PAIRED SCIENCE



Why? What? What if?

How? How?

What if? What? Why?

WHAT'S IT ALL ABOUT?

Science is taught to much younger children now.

Science is very important in the world today.

Children who like science do better at it.

Paired Science is about parents or older children helping young children with science activities that are practical and fun.

It is difficult for teachers to give children enough practical work in science in class. With big groups, teachers cannot usually give enough individual attention to make science in class really interesting and easy to understand.

With the Paired Science activities, perhaps YOU can help!

ACTIVITY SHEETS

There are 45 Paired Science Activity Sheets. They are divided into 7 different areas of science: Air, Magnets, Moving Things, Light, Heat, Myself and Water.

Each activity sheet has a **code number**, so you can keep track of which you have done.

Each sheet has a list of **What You Need** to do the activity. Most equipment is very simple and you will already have lots of it at home. What you don't have, ask for at school! (They will probably have some especially for you to borrow).

Then the sheet tells you **What to Do**. You might need to read this to the child, step by step, to make sure they understand it. Help the child with the practical bits as much as they need to be successful, but don't help ('interfere') too soon!

You will see some **key words** are printed **bold**. These are important words in science. Please use them as much as you can, as you talk about the activity with the child. Talking helps understanding. Explain the words as well as you can. Listen patiently to your child too. Give them time to think.

The activity sheets also have lots of **questions**. Do not just tell the child the answer. Help them bit by bit to work it out for themselves.

You may feel you are not very good at science yourself. Don't worry. Under the heading **Parents** you will find the main scientific ideas behind each activity. Don't just read these to the child - see if they can work it out for themselves.

Under the last heading, **Children**, there are some more questions and ideas for the children to follow up if they are really interested. Sometimes there is a space for them to write and draw. You might need to help write in their answers.

Please write your own short comment here as well - on the activity, the child, or both! Your child will want to show your comments to the teacher. Use another piece of paper if there is not enough room.

ORGANISATION

A Paired Science project usually lasts for 7 weeks.

Parents and children are asked to choose one activity sheet each week. Try to choose from a different area of science each week.

Parents may be able to come into school to help the children choose. Write the number of the activity sheet you have chosen in the correct column of the activity sheet record card in school, against the correct name.

The pair explore the activity during the week. You will need at least 15 minutes perhaps 3 times each week.

Each activity needs only very simple equipment. You may have much of it at home. You should be able to borrow the rest from school. A resealing plastic bag is handy to bring the activity sheet and smaller borrowed equipment back home.

At the end of the week return the activity sheet to school with your comments on it, together with the borrowed equipment left over. The teacher will look at the activity sheet and try to find time to discuss it with your child. Then the sheet will be kept in your child's file as part of their "Profile of Achievement".

Then choose an activity for the next week. If you need help at any time, ask the teacher as soon as you can.

After the seven weeks of the project, your child will have had a 'taste' of all seven science areas. Sometimes parents and teachers meet together at this time to see how the project could be made better.

There is no need to stop! The children will want to go on doing science activities at home. They can go on choosing activity sheets, from any area - they might have a favourite. We would not like them to take more than one each week - because **you** will get worn out! If they don't want to take one every week, that's fine. Return the sheets to school after use in the usual way.

A few children might do all 45 activity sheets. There is still no need to stop! There are a lot of up-to-date books just right for parents and children to go on exploring science. Your school may be able to lend you some. Or if you can afford it, try the nearest big bookshop (look for books from Walker, Longman, Usborne or Kingfisher publishers to begin with).

Remember, if you can help your children to gain an interest in science, you will help them in life. All the activity sheets are linked to National Curriculum attainment targets. By helping children to understand practical science in everday life, you are giving them a really good head start.

PAIRED SCIENCE EQUIPMENT

EQUIPMENT PROVIDED BY THE SCHOOL

To Buy
Cress seeds, plastic mirror, magnets with/without holes, night lights, balloons.

To Collect
Yoghurt cartons, jars, margarine cartons, shampoo bottles, washing up liquid bottles, toilet roll middles, polystyrene trays.

From School Stock
Thick and thin card, tissue paper, coloured papers, rubber bands, sand, glue, paper clips, straws, drawing pins, plasticine.

EQUIPMENT TO BE FOUND IN THE HOME

Magazine	Newspaper	Stone	Metal Spoon
Knife	Fork	Soap	Milk Bottle Top
Penny	Wooden Peg	Apple	Potato
Carrots	Orange	Banana	Pear
Nail	Matchstick	Button	Cling-film
Tissues	Kitchen Roll	Kitchen Foil	Tumbler
Duster	Sugar	Salt	Coffee
Soap Powder	Flour	Mug	Plates
Soup Dishes	Saucers	Plates	Pen
Pencils	Crayons or Felt Tips	Sellotape	Cloth for Blindfold
Toothpaste	Cheese	String	Clock or Watch
Large Needle	Pins	Safety Pins	Hair Grip
Pillow Case	Gloves	Milk	Vinegar
Butter/Margarine	Chocolate	Ice-cubes	Bread
Toaster or Grill	Torch or Lamp	Scissors	Keys
Books	Bricks	Toy Car	Coins
Thread	Comb	Masking Tape or Similar	

PAIRED SCIENCE ACTIVITIES

Air

1. Keep the Paper Dry
2. 3 Candle Race
3. Balloon in the Matchbox
4. Upside Down Water
5. Helicopters
6. Spinning Snake

Magnets

1. Magnet Sorting
2. How Strong is Your Magnet?
3. Paperclip in the Jar
4. Pairs of Socks
5. Getting Dressed
6. Car Race

Moving

1. Static Electricity
2. Bridges
3. Water Jets
4. Hovercraft
5. Sailing Boat
6. Fish Race

Light

1. Growing Cress
2. Fading Colours
3. Funny Faces
4. Shadow Game
5. Symmetrical Pictures
6. Mirror Magic
7. Broken Spoon

Heat

1. Cottage Cheese
2. Ice
3. Jacket Potato
4. Keeping Warm
5. What Melts?
6. Toast

Myself

1. Goldfish Bowl
2. Kim's Game
3. Smelling and Tasting Game
4. Yoghurt Pot Telephone
5. Listening Game
6. Big Ears
7. Feely Bag

Water

1. Carrot Tops
2. Dissolving
3. Steam
4. Rising Water
5. Evaporation
6. Rust
7. Floating and Sinking

ACTIVITY SHEET RECORD

	Write in the number of the sheet you choose						
Name of Child	Air A	Magnets M	Moving Things MT	Light L	Heat H	Myself MY	Water W

NOTE ON EVALUATION

The objectives of Paired Science are to increase motivation, confidence, understanding and practical skills in science, and improve communication and generalisation of these by the child.

In evaluative terms, none of these are easy or quick to measure in a reliable and valid way. Some practical possibilities will be briefly outlined.

1. The Activity Sheets themselves form a permanent record, and even the number of activity sheets completed voluntarily by children is a crude index of their enthusiasm and involvement.

2. Direct observation by professionals during science activities in the classroom should give an indication of whether the effects of Paired Science are generalising into the classroom. If there is time, teachers could use items A1-7 of the parent questionnaire as a checklist to structure such observation of individual children, perhaps relating this to National Curriculum assessment tasks. These structured observations could then be summarised quantitatively, perhaps comparing participant and non-participant groups.

3. The children and parents will give you their opinions of the project verbally, individually or in a group (perhaps at a 'feedback' or review meeting). However, the views of the more verbal and confident will tend to dominate, especially in a group setting. Also, very various verbal feedback is very difficult to summarise - and both parents and children are likely to contradict each other!

4. The Parent Questionnaire in this pack enables you to gather very crude, forced-choice, paper and pencil feedback, but at least this allows quiet pairs to have their say and gives results which are easy to summarise. The summarised results should be fed back to the parents.

5. For older children, it might be possible to construct some form of simple paper and pencil scale of "attitude to science", which could perhaps be used before and after a project. A few simple questions with responding by choosing smiley or grumpy faces could be used. The validity and reliability would certainly be doubtful, however.

6. Assessing changes in scientific understanding is facilitated by the keyword structure. A random sample of 10 high frequency keywords (take every 6th word from the list) could be used with children before a project, and a different random sample (as above but start at the next word) after the project. Children could be asked to explain the keyword or (more reasonably) asked to say which of two or three given explanations is correct, or (even easier) asked to point to which of three or four pictures demonstrates the idea embodied in the keyword. This would be very time consuming done individually, although less reliable done in a group, but may represent an alternative approach to required National Curriculum assessment and thereby kill two birds with one stone.

7. In this latter context, improvements in children's practical scientific skills could be assessed by giving them a sample task requiring them to formulate and test a hypothesis, on an individual basis. Sample tasks could be drawn from a bank of such tasks. (Generalisation to completely novel tasks could also be assessed in this way). Again, this is very close to National Curriculum prescribed assessment methodology - but very time consuming!

Whatever form of evaluation you use, the creators of this pack would be very interested to see a summary of your results. This will help us to improve the pack. Please write to: The Centre for Paired Learning, Department of Psychology, University of Dundee, DD1 4HN. Thank you and good luck!

PAIRED SCIENCE - KEYWORDS

Some keywords will be found frequently in many activities. The most common are **what? what happens? why?** and **how? Test, same** and **different, change** and **change back** are frequent too. Some activities ask the child the **improve the design.** Other scientific keywords are listed below, by activity, and a list of the next most frequent keywords is at the end.

Air

A1	Wet, full, air, experiment.
A2	Burn, length of time, air, oxygen, used up, burning.
A3	Feel, hear, inflate, air pressure, stretch, vibrate, force, escaping, push.
A4	Hold up, normal, air pressure, push, upwards, weight, downwards.
A5	Height, time, fall, quickly, slowly, air, trapped, push up, larger area.
A6	Warm, draughty, movement, air, hot, rises, cool, sinks, wind.

Magnets

M1	Object, attract, magnet, metal, iron, steel.
M2	Strong, hold, strength, attract, attraction.
M3	Touch, through, water, attract, thickness, pick up, move.
M4	Power, magnetism, easier, harder.
M5	In order, correct, power, magnetism, easier, harder, magnetic.
M6	Attract, power, magnet, invent, magnetic.

Moving Things

MT1	Attract, static electricity, safe, dangerous.
MT2	Bridge, strong, weight, span, structure, strength.
MT3	Blow, above, pressure, air, pressing.
MT4	Hovercraft, move, touching, cushion of air, higher pressure, hover.
MT5	Boat, shape, float, move, touching, wind, air pressure, push, surface area, strong, heavier.
MT6	Move, touching, wind, air pressure, push.

Light

L1	Wᴗ light, dark, look, grow, cold, warm, dry, heat, water.
L2	Colour, dark, light, look, fade.
L3	Shiny, reflection, mirror, smaller, larger, size, curve, direction, image, beams, light, up-side down.
L4	light, shadow, turn round, recognise, nearer, further, travels, straight lines, shape.
L5	Look, exactly, both sides, symmetrical, flat, reflect, straight, image.
L6	Mirror, longer, shorter, shape, fewer, pair, flat, reflect, straight, image, double.
L7	Look, broken, whole, through, water, bigger, smaller, travel, straight, air, water, image.

Heat

H1	Heat, boil, liquid, solid, chemical, acid, separate.
H2	Freeze, ice, water, expand, contract, melt.
H3	Look, feel, smell, rises, hot, taste, size, shape, colour, liquid, steam, gas, solid, melt, reverse.
H4	Hot, cover, escape, cool, stop, insulation, keep heat in, warm, cold.
H5	Melt, hot, time, longest, liquid, solid, shape, heated.
H6	Look, feel, smell, sound, taste, see, permanent, reverse, heat.

Myself

MY1	Spins, pictures in our mind, images.
MY2	Look, remember, feel, senses, memory.
MY3	Smell, taste, senses.
MY4	Talk, listen, hear, sound, travel, vibrate, air, string.
MY5	Listen, sound, loudest, travel, air, liquid.
MY6	Hear, distance, cone, air, vibrate, collect, concentrate, waves.
MY7	Look, describe, feel, sense.

Water

W1	Water, dry, wet, growth, plants, light.
W2	Warm, water, dissolve, liquid, solid, see, disappeared, cold, temperature.
W3	Shiny, look, feel, rise, cold, steam, water, condensation.
W4	Water, level, heavy, sink, push out, displace, size, volume, float.
W5	Wet, cover, warm, cool, air, vapour, escapes, evaporation.
W6	Do, made of, iron, water, rust, combines, oxygen, oxidise.
W7	Float, sink, heavy, density, shape, weight, size, hollow, air, water, displace, experiment.

75 KEYWORDS OCCURING MORE THAN ONCE

Ten keywords occur **very** frequently:
What?, What Happens?, Why?, How?, Test, Same, Different, Change, Change Back, Improve the Design.

(For other keywords appearing more than once, frequency of occurrence is in brackets).

Air (11)
Water

Look (9)

Feel (6)
Shape
Air Pressure
Push (out & up)
Attract(ion)

Warm (5)
Heat(ed)
Liquid
Light
Image
Straight

Wet (4)
Hot
Touch
Move
Solid
Size

Cold (4)
Travel

Time (3)
Hear
Vibrate
Weight
Cool
Sink(s)
Wind
Strong
Float
Heavy
Melt
Smell
Taste
Sound
Sense
Shine
Reflect

Experiment (2)
Burn
Oxygen

Escape (2)
Hold
Area
Iron
Through
Power
Easier
Harder
Magnetic
Rise
Colour
Steam
Reverse
Cover
See
Listen
Dry
Grow
Displace
Dark
Mirror
Smaller
Larger

PAIRED SCIENCE

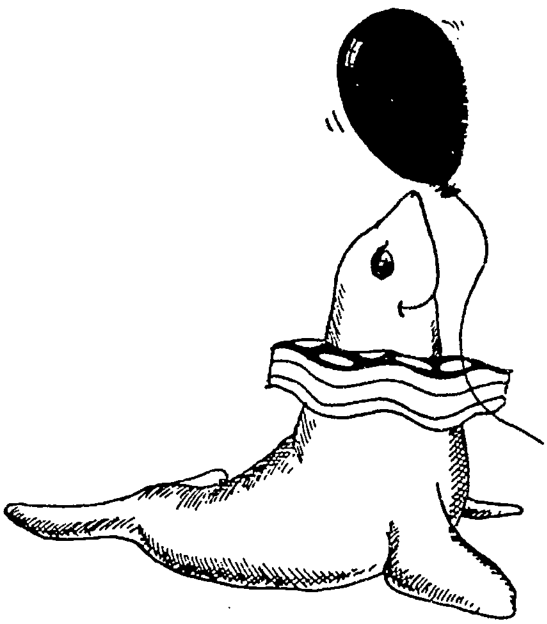
What do you think?

Name of child: ______________________________

	NO	YES	NOT SURE
A Since doing Paired Science, is your child:	(Choose & Tick)		
1. More **interested** in science?	☐	☐	☐
2. **Enjoying** science more?	☐	☐	☐
3. More **confident** in science?	☐	☐	☐
4. **Understanding** science words and ideas more?	☐	☐	☐
5. Better at **testing** out ideas practically?	☐	☐	☐
6. Able to **explain** science ideas better?	☐	☐	☐
7. **Asking** more 'why?' and 'how?' questions about everday life?	☐	☐	☐
B Are YOU:			
1. Enjoying science more?	☐	☐	☐
2. Understanding science more?	☐	☐	☐
C Are you going to:			
(a) Stop Paired Science and perhaps start again later?	☐	☐	☐
(b) Go on doing Activity Sheets, but only now and again?	☐	☐	☐
(c) Go on doing Activity Sheets every week?	☐	☐	☐
(d) Go on doing science together, but in a different way?	☐	☐	☐

D If you have any other comments, perhaps about some practical problems you met, please write them on the back of this form. Thank you for helping make Paired Science better.

A1 Keep the Paper Dry

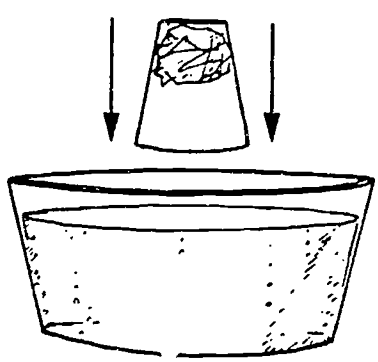


You Need:

a small glass
a big bowl of water
a small piece of paper

What to do:

Can you put the paper into the water **without** getting it **wet**? Screw the paper into a ball and push it into the glass. Turn the glass upside down and put it straight down into the water.



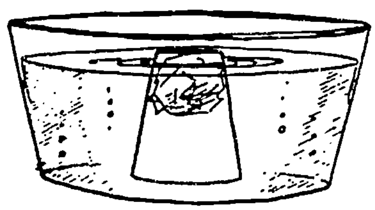
What happens? Why can't the water get into the glass? Tip the glass sideways. **What happens** now?

Parents:

Water cannot get into the glass because it is **full of air.**

Air cannot get out until you tip the glass sideways, allowing water in.

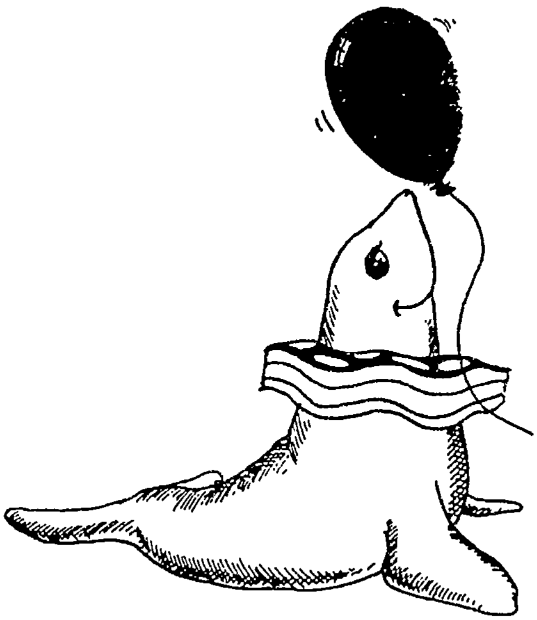
Children:



Can you draw a line to show where the water will be in this glass?

You might like to **experiment** with plastic tubs and cartons in the bath.

A2	3 Candle Race



You Need:

three saucers
one large jar
one small jar
3 small candles or night lights

What to do:

Ask a grown up to put each candle on a saucer and light them. Then cover two of the candles with a jar, at the same time.

What will happen to the candles?

Will they all **burn** for the **same length of time**?

Why do you think this happens?

What else is inside the jars with the candles?

Parents:

Air is inside the jars and the **oxygen** in it is **used up** by the **burning** candle. When there is no more oxygen, burning is no longer possible and the candle goes out.

The larger the jar, the more air (and oxygen) is available.

Children:

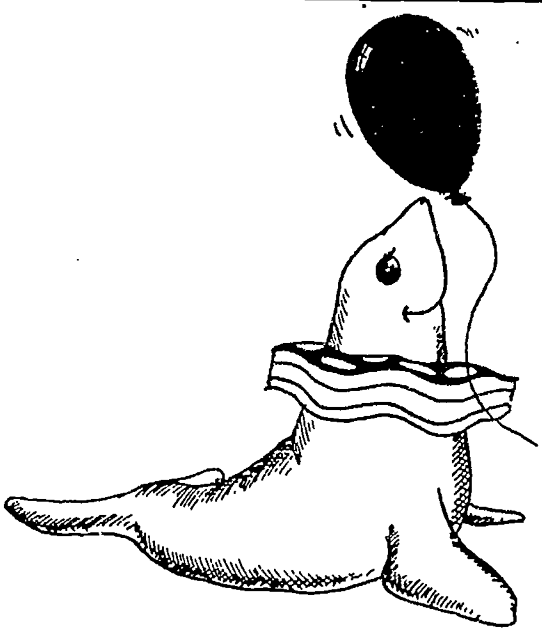
What did the candles need to go on **burning**?

Have you ever made a turnip lantern?

How should you make it so that the flame burns well?

You can draw or write about it here.

A3 Balloon in the Matchbox



You Need:

balloon
matchbox

What to do:

Put the baiioon into the matchbox. Does it go in easily?

Take the balloon out. Blow it up and hold the neck tightly. Can you put it into the matchbox now?

How have you **changed** the balloon? What have you put inside it?

Now let go of the neck of the balloon slightly. What can you **feel**? What can you **hear**?

Hold the balloon up in the air and let go. What happens? **Why** does this happen?

Parents:

When you blow up a balloon it is **inflated** by extra **air pressure** and the rubber **stretches**.

When you let go of the balloon the extra air rushes out of it. If you hold the neck of the balloon the rushing air **vibrates** it and makes a noise. When you let go completely, the **force** of the **escaping air pushes** the balloon forwards, like a jet engine.

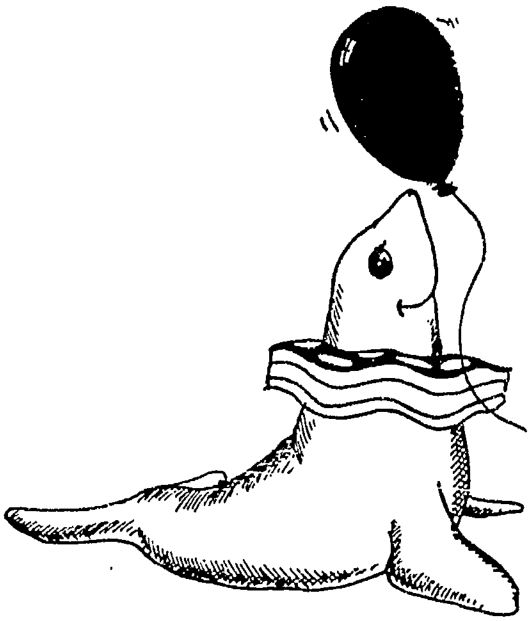
Children:

Some people travel in baskets hanging from large balloons.

Can you find out what makes them rise up into the air?

You can draw or write about it here.

A4 Upside Down Water



You Need:

straw
water
small glass
small piece of thin card

What to do:

Ask a grown up to help you to do this.

Fill the glass with water until it overflows.

Press the piece of card down onto the top of the glass and turn it upside down quickly.

Keep hold of the glass but let go of the card. **What** do you think **will happen**? What **does happen** to the card? What happens to the water? **What is holding the card up?**

Parents:

The **normal air pressure** all around us is **pushing upwards** more strongly than the **weight** of the water is **pushing downwards**.

Why doesn't this work without the piece of card?

Children:

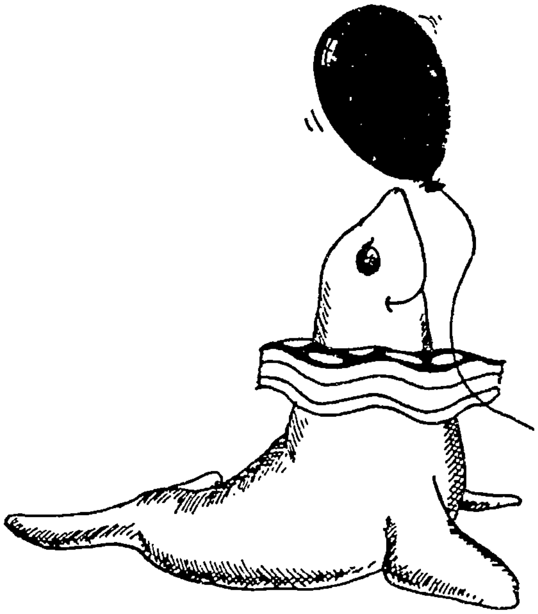
Dip a straw into a glass of water.

If you keep your finger over the top, and lift the straw out, the straw will stay full of water.

What will happen if you take your finger off the straw? **Why** do you think this happens?

You can draw and write about it here.

A5 Helicopters



You Need:

scissors
paper clip
2 pieces of paper
(exactly the same)

What to do:

Drop both pieces of paper from the **same height** at the **same time.** What happens?

Do they **fall quickly** or **slowly**?

Change one piece of paper by screwing it into a ball. Now drop them again. What happens?

Do they both **fall in the same way** this time? Can you explain what is happening?

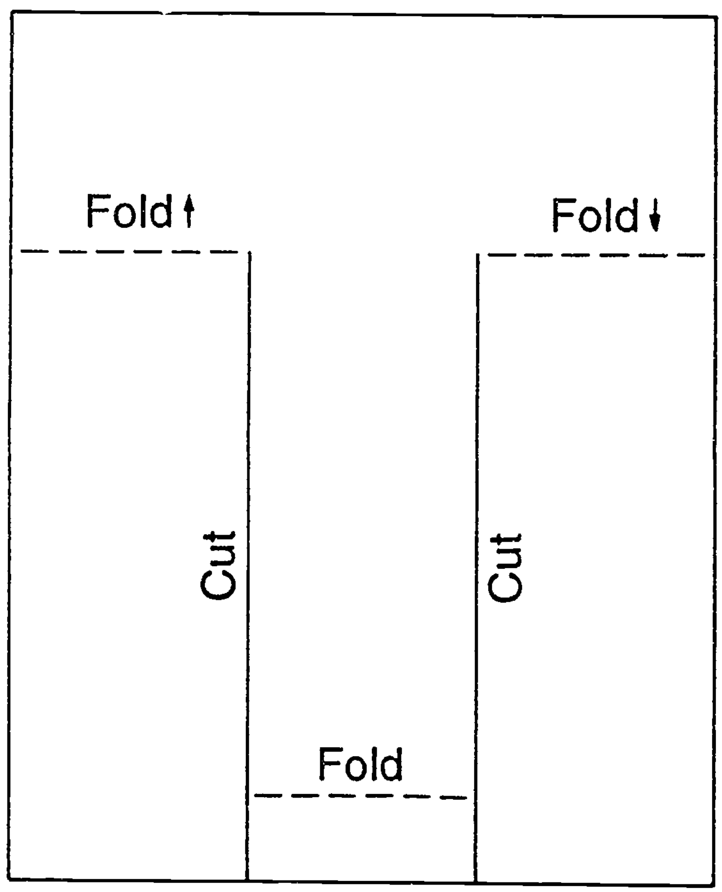
Now try making something that falls in a different way.

Parents:

As the papers fall, **air** is **trapped** underneath them. The air **pushes up** and stops the papers falling so fast.

The flat paper falls more slowly than the crumpled one because it has a **larger area** and so traps more air underneath.

Children:

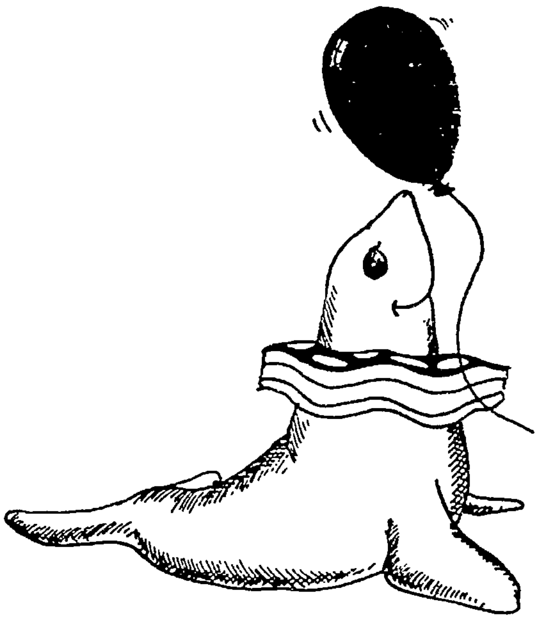


Cut out your helicopter and fold one wing forwards, the other backwards. Fold up the end of the tail and put on a paper clip.

Have helicopter races.

See if you can **improve the design.** 29

A6	Spinning Snake

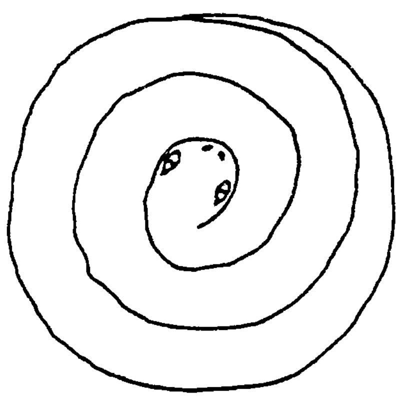


You Need:

card
thread
scissors
drawing pin
crayons or felt tips

What to do:

Draw a big snake like this onto your card.



Colour the snake and cut it out. Put a piece of thread through the top of its head and hang it up. Watch what happens. Try putting your snake in different places in your house. Try a **warm** place such as over a radiator, near a **draughty** place like the front door, and so on. What happens?

Parents:

The snake is moved by **movement** in the **air** which is all around us.

Hot air above radiators **rises** and causes the snake to spin.

Cool air is heavier and **sinks.** **Wind** also moves air.

Children:

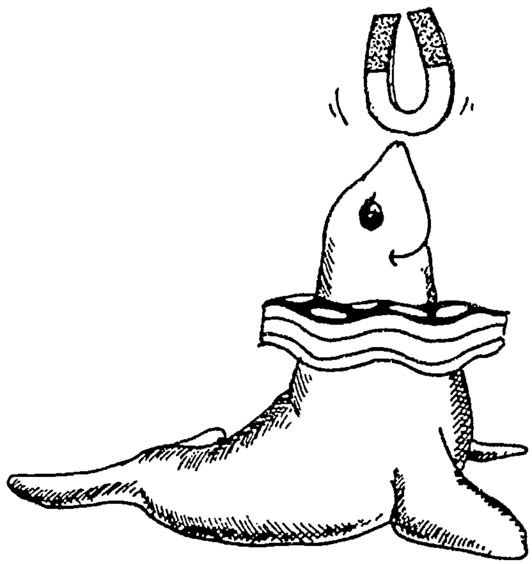
Where does your snake spin the most?

What does this tell you about air?

Why does air move? **How many reasons** can you think of?

You can draw or write about it here.

M1 Magnet Sorting



You Need:

nail
stone
comb
magnet
paperclip
safety pin
drawing pin
rubber band
hairgrip
penny
pencil

What to do:

Guess which of the **objects** will be **attracted** by the **magnet** and which will not. Sort them into two sets. Draw them.

ATTRACTED	NOT ATTRACTED

Now **test** them all by holding each one near to the magnet. Put a ✓ if you were right, a ✗ if you were wrong.

Parents:

Magnets only **attract** certain things.

They will attract **metals** containing **iron** or **steel**, but not other metals.

Children:

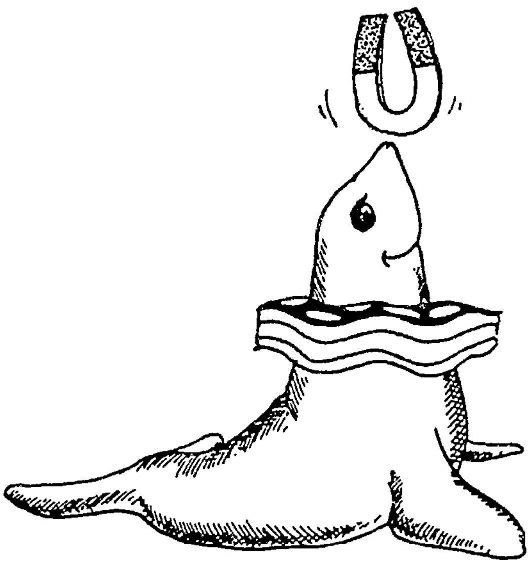
Can you find anything else to test?

Look around your house, but keep the magnet away from watches or tape recorders.

The fridge might have a magnet in it. Can you find it?

MAGNETS

M2 How Strong is your Magnet

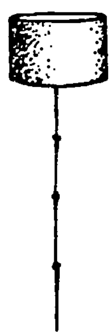


You Need:

magnet
pins
paper clips
drawing pins

What to do:

How **strong** is your magnet? Use the pins to find out. **How many** pins will your magnet **hold** at once? Hang them on one after the other like this:



Do the same with drawing pins or paper clips. Write down how many pins, drawing pins, paperclips. **Why** are the numbers different?

Parents:

Different magnets have different **strengths** and powers of **attraction**, which is only partly to do with the size of the magnet.

What other things might effect the different results in these activities?

Children:

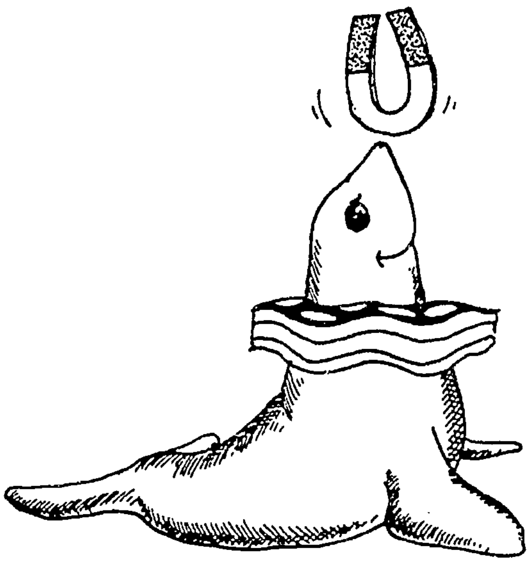
Find out how far your magnet can **attract** or pull a pin.

Put your magnet here	1	2	3	4	5	6	7	8	9	10	11	12

Put the pin at 10cm. Push it slowly towards the magnet. When the pin jumps to the magnet, keep your finger still. This shows how far the pin has jumped.

How can you find out which part of the magnet **attracts** the most?

M3	Paperclip in the Jar



You Need:

paperclip
jar of water
magnet
tissue

What to do:

Put the paperclip into a jar of water.

How can you take it out of the water **without touching it** or getting your fingers wet?

Think. Will your magnet work **through water**? What else will the magnet work through?

Parents:

A magnet will **attract through** some other substances.

Does the **thickness** of the other substance make any difference?

Children:

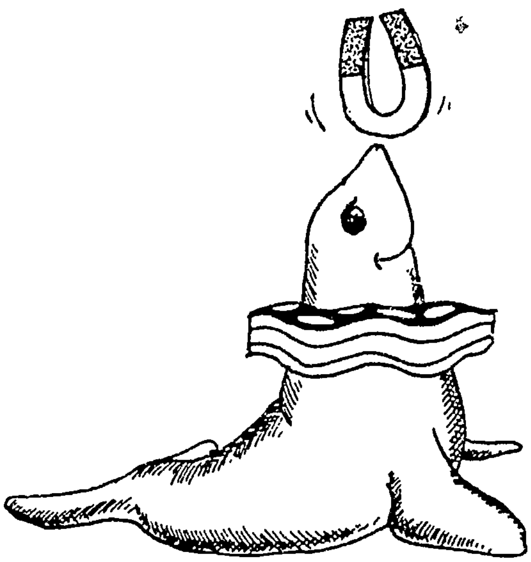
Put a tissue and the paperclip on the table.

How can you use your magnet to **pick up** the tissue?

How else can you use the magnet to **move** things or **pick them up**?

Write or draw about it here.

M4 Pairs of Socks



You Need:

thread
scissors
12 paperclips
crayons or felt tips
2 magnets with a hole

What to do:

Colour the socks so all six pairs look different.

Cut them out and fix a paperclip onto each one.

Tie a thread to your magnet and try to catch the socks.

Whoever catches the most pairs wins.

Parents:

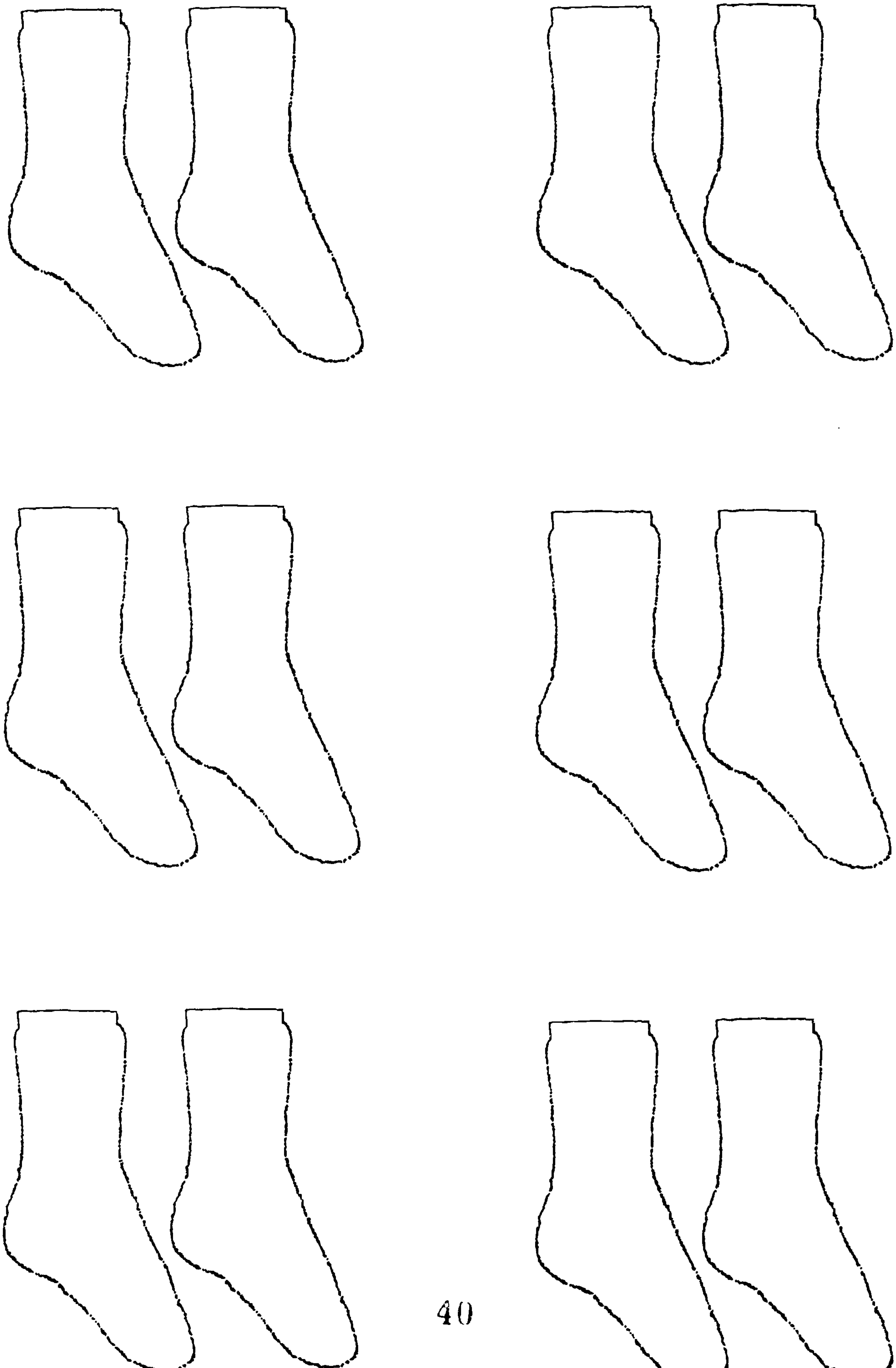
This activity shows the **power** of **magnetism** - and is fun.

How could the game be made **easier** or **harder**?

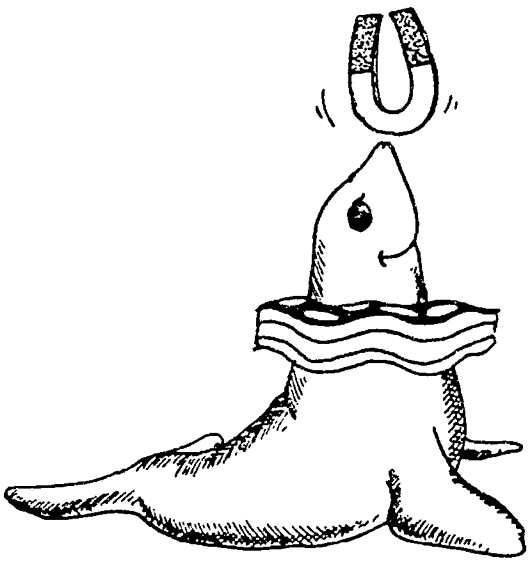
Children:

You can do this with fish or anything else you like.

Make fishing rods if you like.



M5	Getting Dressed



You Need:

thread
scissors
magnet with a hole
crayons or felt tips
8 paper clips or safety pins

What to do:

Colour the clothes and cut them out.

Put a paper clip or pin on each.

Now try to catch the clothes **in the correct order** for getting dressed or undressed.

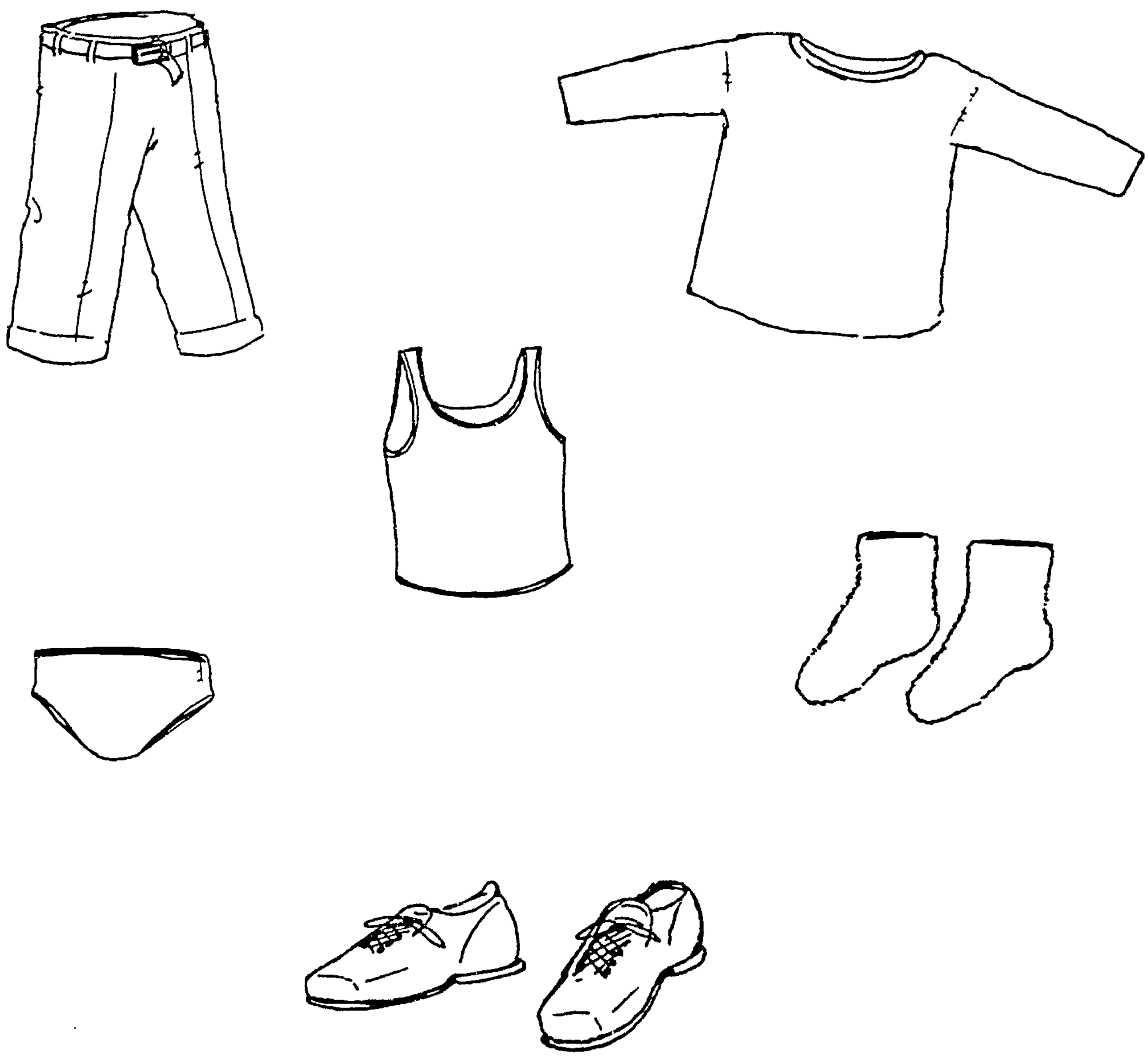
Parents:

This activity shows the **power** of **magnetism** - and is fun.

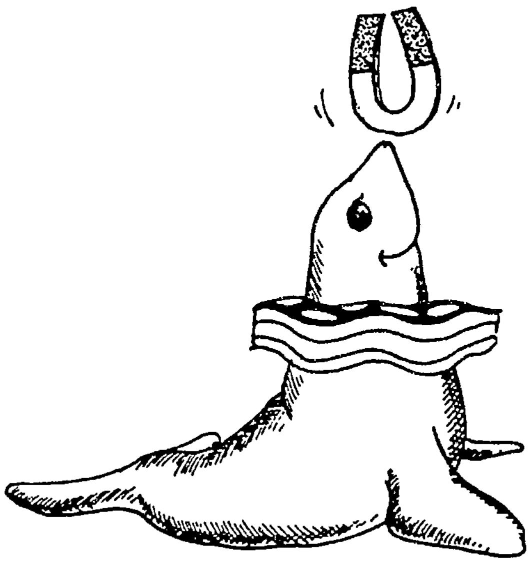
How could the game be made **easier** or **harder**?

Children:

Can you make up a different **magnetic** game of your own?



M6	Car Race



You Need:

glue
card
scissors
sellotape
2 pencils
2 magnets
2 paper clips
crayons or felt tips

What to do:

Draw two cars on card, colour them and cut them out.

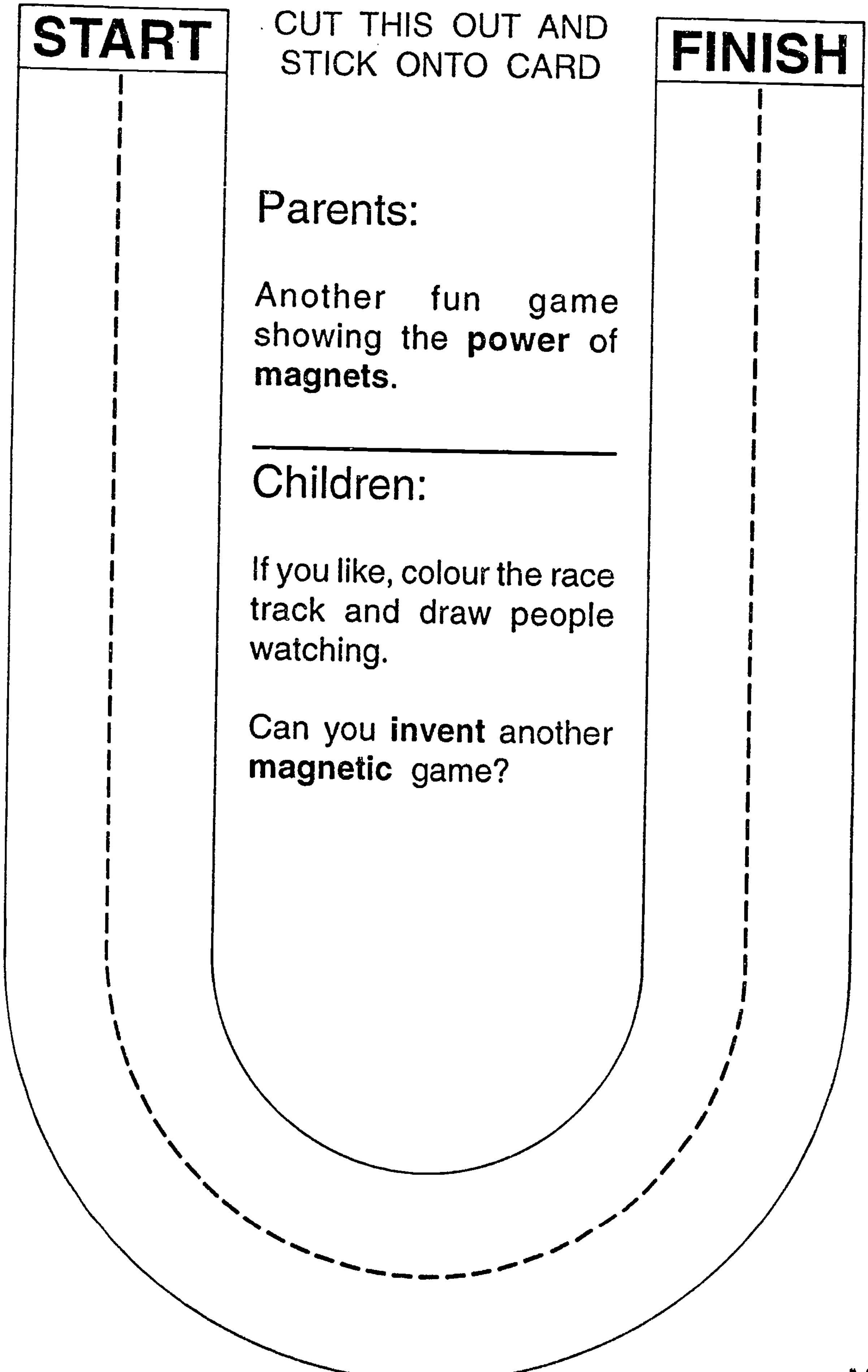
Fix a paper clip onto the back of each with sellotape.

Fix each magnet onto the end of a pencil with sellotape.

Use them to **attract** the cars round the track.

READY . . . STEADY . . . GO !

CUT THIS OUT AND STICK ONTO CARD



Parents:

Another fun game showing the **power** of **magnets**.

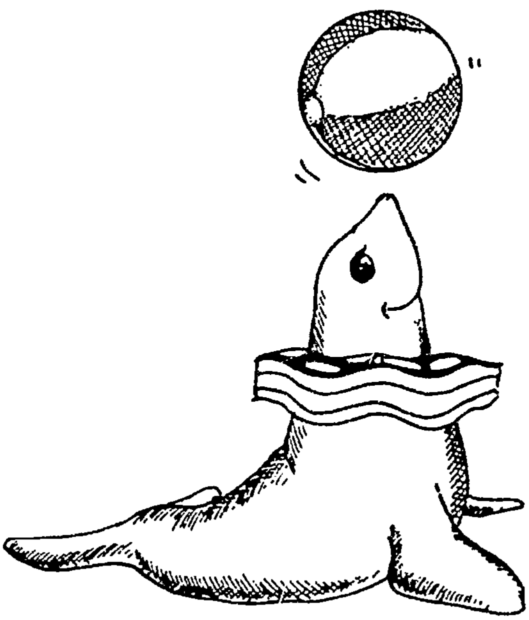
Children:

If you like, colour the race track and draw people watching.

Can you **invent** another **magnetic** game?

MOVING THINGS

MT1 Static Electricity



You Need:

pen
tissue
kitchen foil
newspaper

What to do:

Tear a thin sheet of tissue paper into small pieces. Hold the pen near to them. What happens?

Rub the pen on a woollen jumper several times, whilst counting to twenty. Now hold the pen near to the pieces of paper again. What happens now?

Try it with small pieces of foil or newspaper. Does the same thing happen?

Look for other things that are made of plastic, like a comb or a plastic spoon. Will they **attract** pieces of paper when rubbed?

Why and **how** do you think this happens?

Parents:

The rubbing makes **static electricity** on the pen.

This **attracts** the tissue to the pen.

Children:

You have made **static** electricity. It is **safe** electricity.

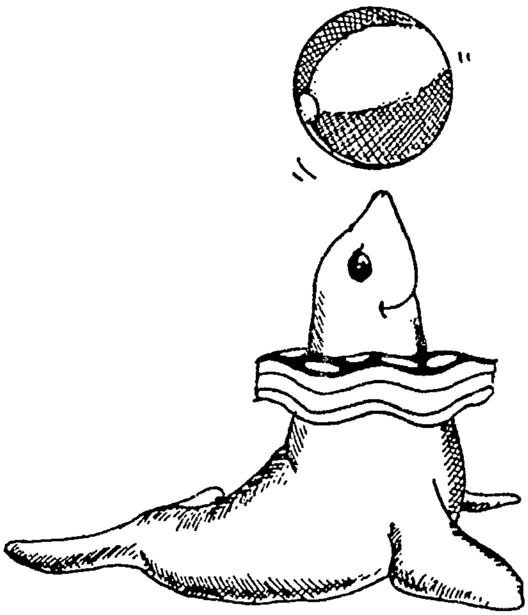
Try rubbing other things to see if they make static electricity.

Can you find anything that is worked by **dangerous electricity** in your home?

Ask your parents about the safe way to hold plugs.

You can draw or write about it here.

MT2	Bridges



You Need:

small car or a pile of coins
three pieces of paper
books or bricks

What to do:

Make a **bridge** with the books or bricks and the paper.

Put the car or coins on top. What happens to the paper? Is it a **strong** bridge?

Try folding your papers. Fold them in different ways. Can you make stronger bridges now?

Test your bridges.

Which one is the strongest? **Why** do you think that is?

How many cars or coins will it hold (**weight**)? How long can the bridge be (**span**)?

Parents:

Try folding the paper backwards and forwards like this:

Or fold the edges of the paper like this:

Different **structures** have different **strengths.**

Children:

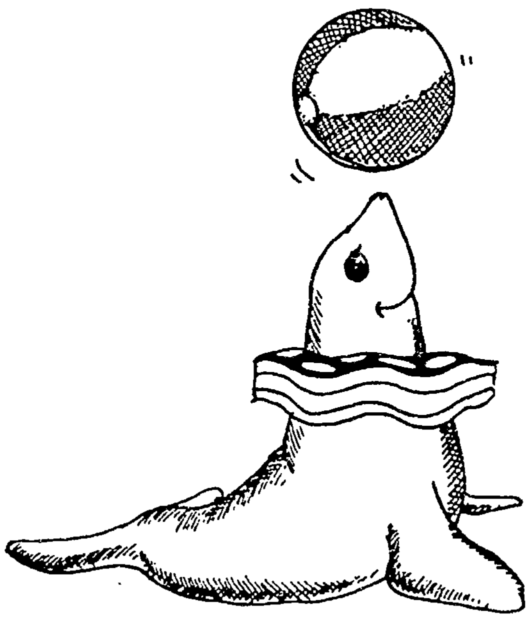
Real bridges are not made of paper.

What other things could you make bridges of, so they would be stronger?

Bridges often carry roads. Can you think of any other ways of travelling over a bridge?

You can draw or write about it here.

MT3	Water Jets

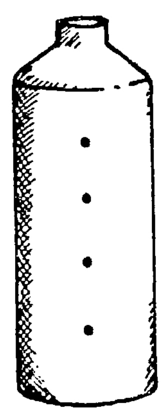


You Need:

an empty washing-up liquid bottle
a large needle
sellotape
water

What to do:

Ask a grown up to make four holes in the bottle like this:



Cover the holes with sellotape. Now stay by the sink or go outside - this could be messy! Fill the bottle with water. Now take off the tape. See how the water squirts out of each hole in a **different way**. **What** different ways? **Why** is this? Try **blowing** into the top of the bottle. What happens now? Why?

Parents:

The more weight of water there is **above** each hole the more **pressure** there is to push the water out further.

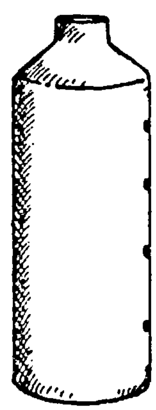
Blowing into the top of the bottle adds extra **air pressure** on the water.

Talk about **pressing** and **pressure** with your child. Pressure does not always make movement - **why**?

Children:

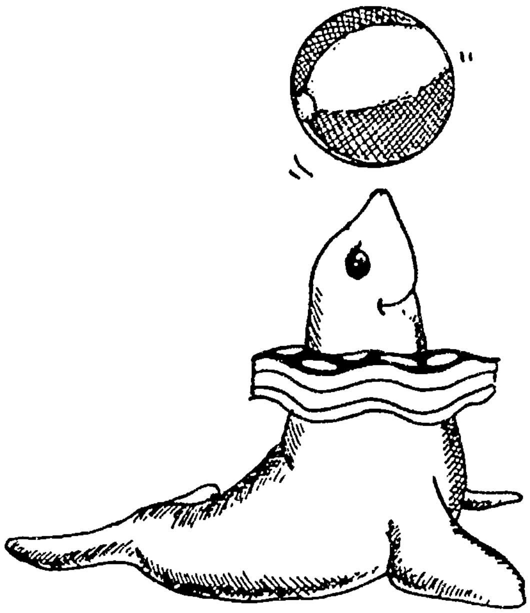
Can you draw the way the water comes out of the holes?

Where does it squirt out the furthest - at the top or at the bottom?



Try making a different pattern of holes on another bottle. How does the water come out now?

MT4 Hovercraft

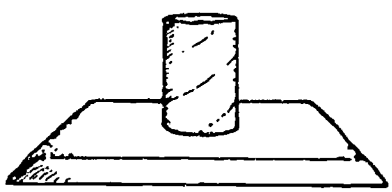


You Need:

toilet roll middle
(or other cardboard tube)
polystyrene tray
(or thin round margarine carton)
sellotape
scissors

What to do:

Ask a grown up to fix the toilet roll middle into a hole in the tray like this:



How can you make your **hovercraft move** without **touching** it?

Parents:

By blowing down the hole in the top you create a **cushion of air** of **higher pressure** on which the hovercraft "floats" or **hovers**.

Children:

Test your hovercraft on different surfaces - the table, the carpet, outside on the path, on the kitchen floor.

Where does it work best? **Why**?

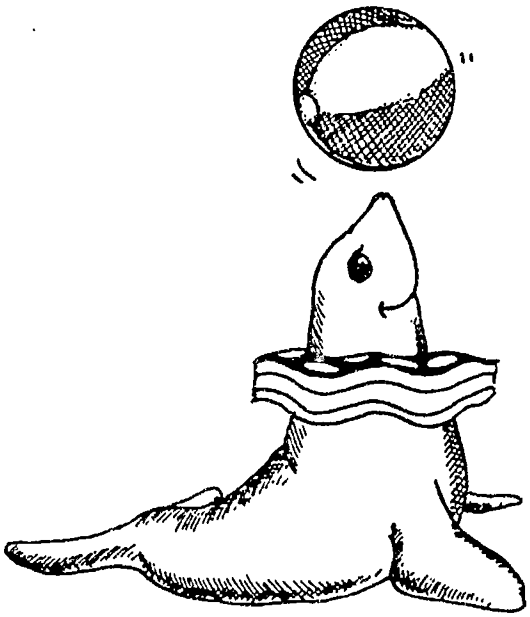
Make another and have races.

How can you **improve** the **design**?

What other things **hover** - and how?

You can draw and write about it here.

MT5	Sailing Boat



You Need:

straws
sellotape
newspaper
piece of card
piece of kitchen foil
bowl or bath of water

What to do:

Make your piece of foil into a **boat shape.**

Put it on the water. Does it **float**?

How can you make your boat **move** without **touching** it? What can you use to make a **wind**?

Try different ways: blow, wave your hands, wave a piece of card or a newspaper, blow through a straw - which works best?

Why?

Parents:

Blowing or fanning increases the **air pressure** and **pushes** the boat through the water.

The bigger the **surface area** of the boat the more it will move, other things being equal.

Children:

Give your boat a sail.

Does this make any **difference** to the way it moves?

Make a paper man for your boat and give him a ride. Is the boat **strong** enough to hold him?

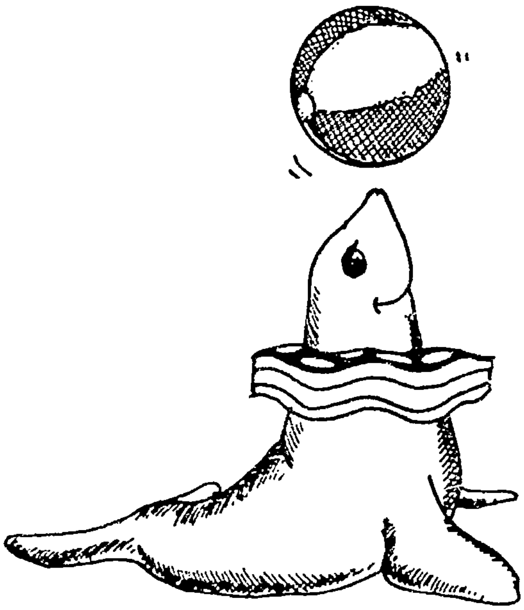
Will the boat hold anything **heavier**?

Now make another boat and have a race.

Can you **improve** the **design**?

You can draw and write about it.

MT6	Fish Race

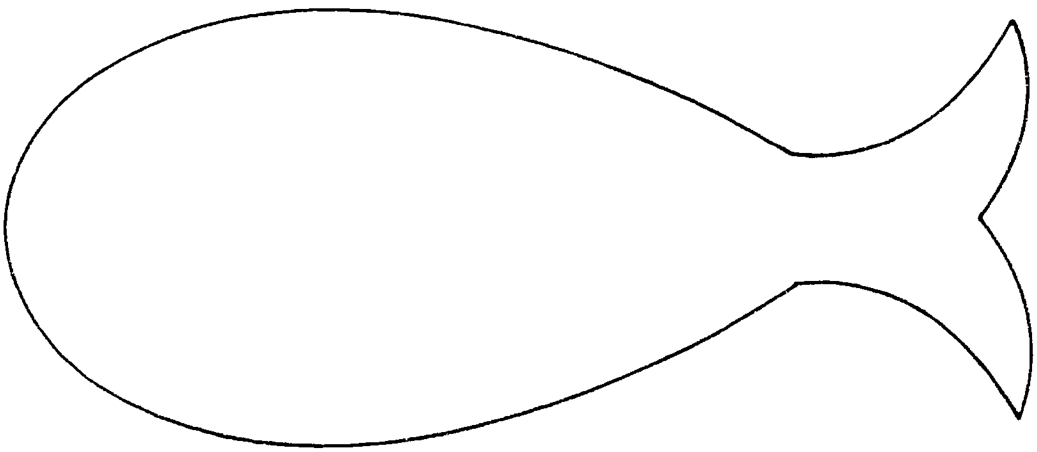


You Need:

card
pencil
scissors
magazine
newspaper
tissue paper
writing paper

What to do:

Cut out a fish shape from tissue paper by tracing this pattern.



Put the fish on the floor.

How can you **move** the fish without **touching** it?

Clue - make a **wind**.

Parents:

Fanning makes a wind and creates **air pressure** which **pushes** the fish.

Children:

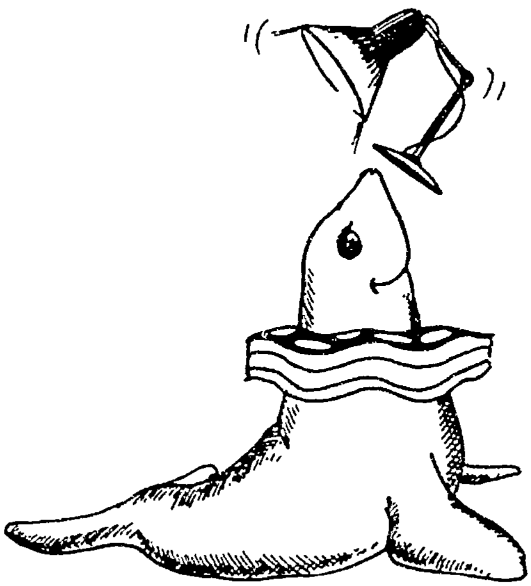
Which is the best for **making a wind**? - the card, writing paper, newspaper or magazine?

Why is it the best?

How do you think the winds in the sky are made?

Make another fish and have races.

L1 Growing Cress



You Need:

two saucers
tissue or kitchen roll
cress seeds
water

What to do:

Put the paper onto the saucers, **wet** it, then sprinkle the seeds evenly over the paper. Put one saucer in the **light** and one in the **dark**.

Look at your seeds every day. What do you notice about your seeds when they are **wet**? How do they **change**?

Remember to water them every day. Where do your seeds grow best - in the light or in the dark?

How many days does it take for your cress seeds to grow? How can you find out if seeds like **cold** or **warmth**? Do they like to be **wet** or **dry**?

Parents:

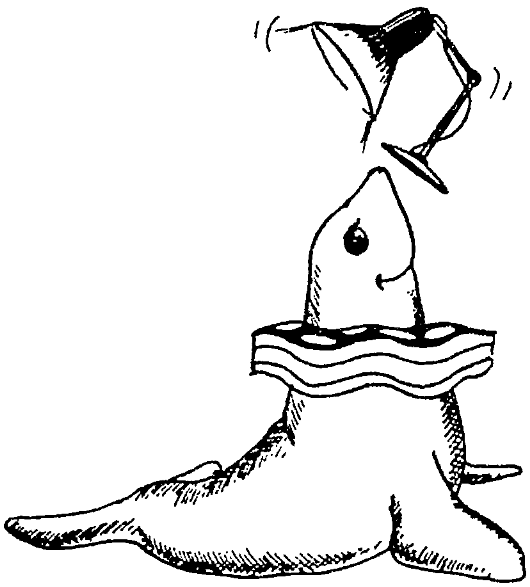
Seeds need **light, heat** and **water** to give them **energy** to grow.

Children:

What did you find out?

You can draw or write about your seeds here.

L2	Fading Colours



You Need:

8 paper clips
black paper
something to draw round
(to make a circle)
two sets of coloured papers
(red, yellow, brown, blue in each)

What to do:

Cut out 8 black circles. Clip each circle over a piece of coloured paper.

Put one set of coloured paper in a **dark** cupboard. Put the other set on a windowsill in the **light**.

Look at them after one week. Take off the black circles. Have any of the papers **changed** in any way? How are they **different**?

Have some changed more than others? What did the **light** do to the colours? What did the black paper do?

Parents:

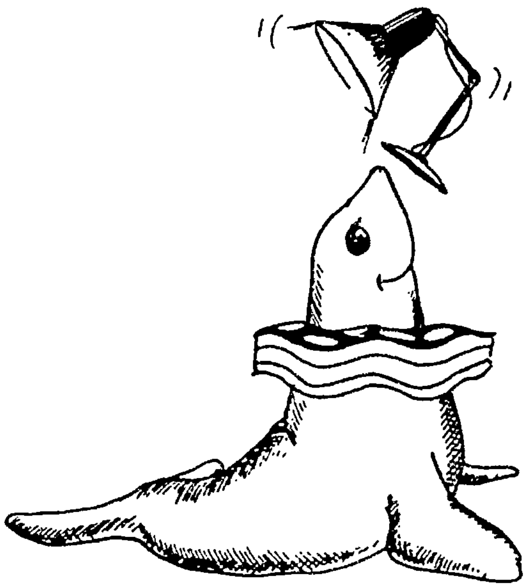
Light makes **colours fade** (go less bright). Some colours **fade more** than others.

Children:

What did you find out?

You can draw or write about it here.

L3 Funny Faces



You Need:

a large shiny metal spoon

What to do:

Look at yourself in the **shiny back** of a large spoon. What do you notice about your **reflection** (the picture or image of yourself which shines back at you)?

Is it the same as in a **mirror**? Are you **smaller**, or **larger**, or the **same size**?

Now look at yourself in the **front** of the spoon. What do you notice about your **reflection** now?

Can you find your reflection anywhere else in the house?

Parents:

Because light is **reflected** off different parts of the **curve** of the spoon in different **directions**, you get a bent or distorted **image**.

If the **beams** of light that are reflected **cross** each other, you also get an inverted (**upside down**) image.

A **flat** mirror reflects all light back in a **straight** line.

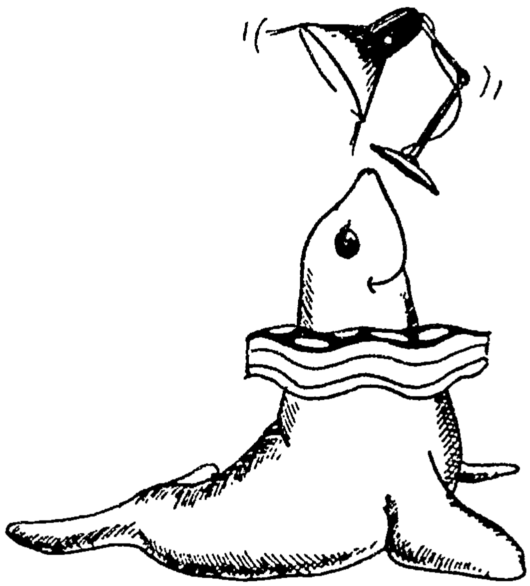
Children:

Where else did you find your reflection? What did it look like - the same as in the spoon or different?

What did your reflection look like in different places?

You can draw or write about it here.

L4	Shadow Game



You Need:

a dark room
a torch or a table lamp
six hidden objects
(eg: keys, fork, toy, mug, plate, scissors)

What to do:

Ask a grown up to hide the 6 objects until you are ready to begin.

The grown up should shine a **light** on the wall and hold an object in the light to make a **shadow**. Sit facing the wall and try to guess the name of each shadow as the objects are held up.

How many can you guess correctly? If the object is **turned round**, can you still **recognise** it?

Try moving the object **nearer** or **further** away from the light. What **difference** does this make?

Now you try. Use the plate. Can you make the shadow into a **circle** or into a **straight line**? Try the mug. Can you change its shadow shape into a **rectangle** or into a **circle**?

Parents:

Because light **travels** in **straight lines** through the air and cannot bend around objects, the shadows have the same shape as the objects.

The **nearer** the object is to the light, the more light it blocks out and the **bigger** the shadow.

Children:

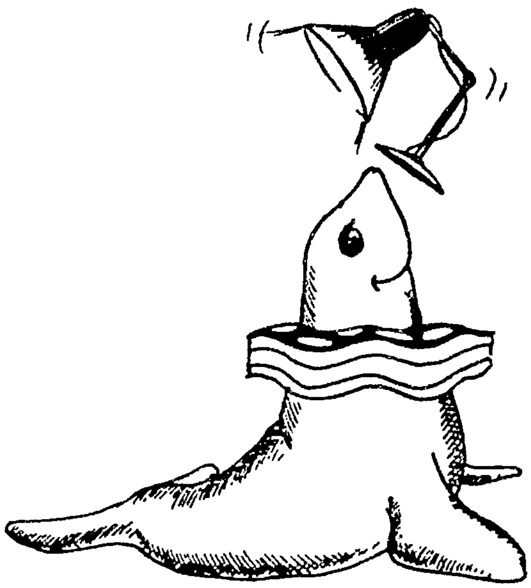
What did you find out?

You can write or draw about it here.

Can you draw different shadow shapes that could be made by the same object?

What shadow shapes can you make with your fingers?

L5 Symmetrical Patterns

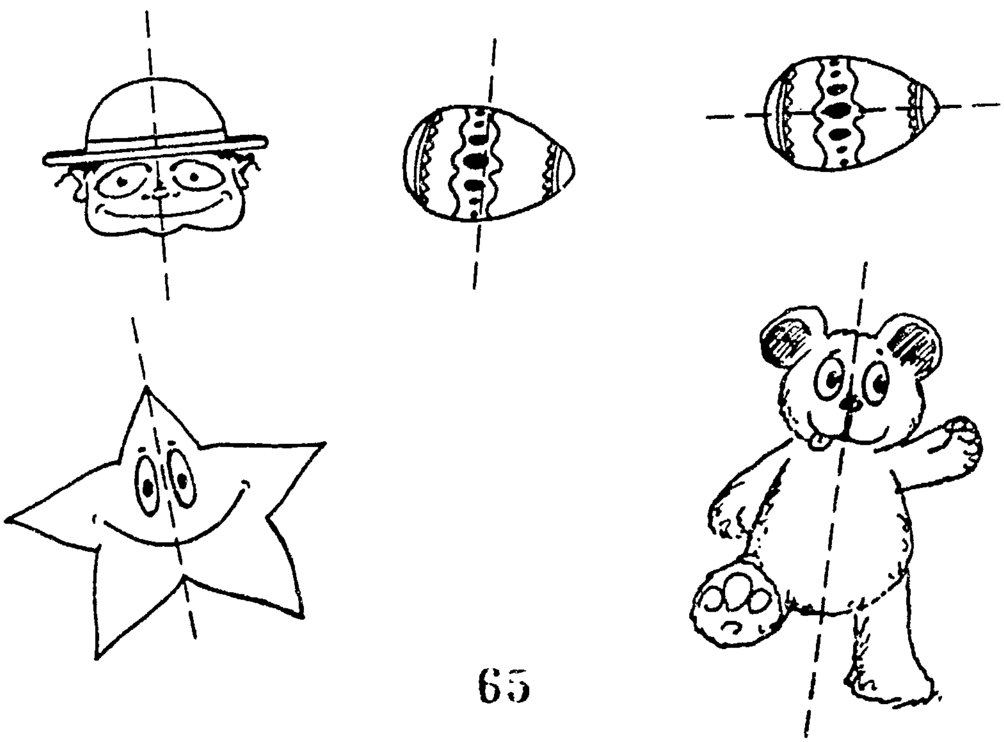


You Need:

a mirror with a flat side
crayons or felt tips

What to do:

Look at these pictures. Which are the **same** on **both sides** of the dotted line?



Put your **mirror** on the dotted line to help find out. Things that look **exactly the same** on **both sides** are called **symmetrical.**

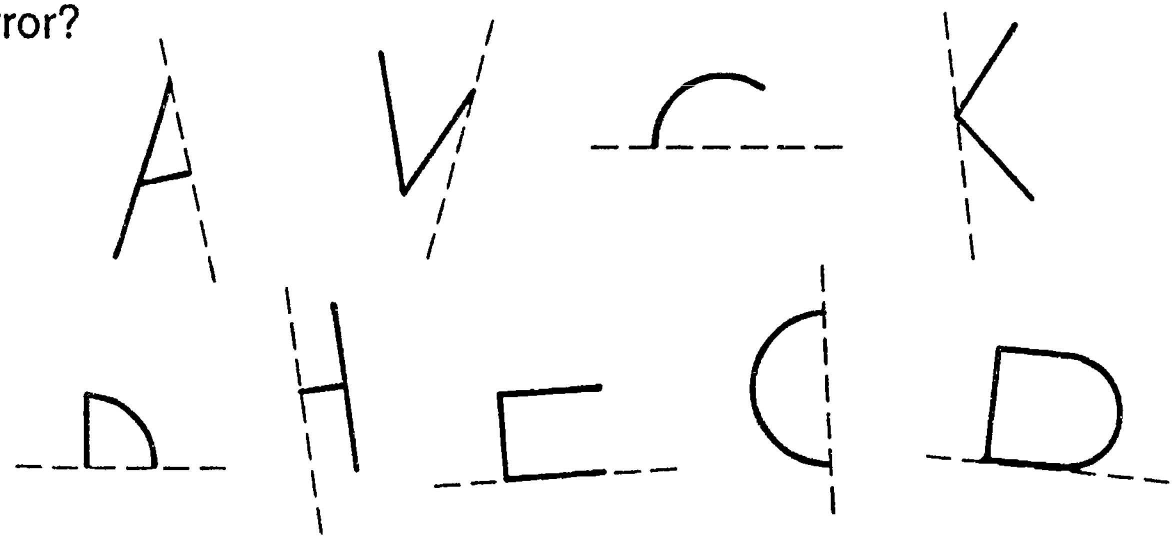
Colour in the pictures that really are **symmetrical.**

Parents:

Flat mirrors **reflect** light in **straight lines** and give you exactly the same **image** as the original object. If a flat mirror put across **half** of any drawing or letter does not give a combined (real + reflected) image which looks like the whole thing should be, either you have not found the right '**line of symmetry**' to split it in half, or the original just isn't symmetrical in **any** way.

Children:

Can you finish off drawing these letters with the help of your mirror?

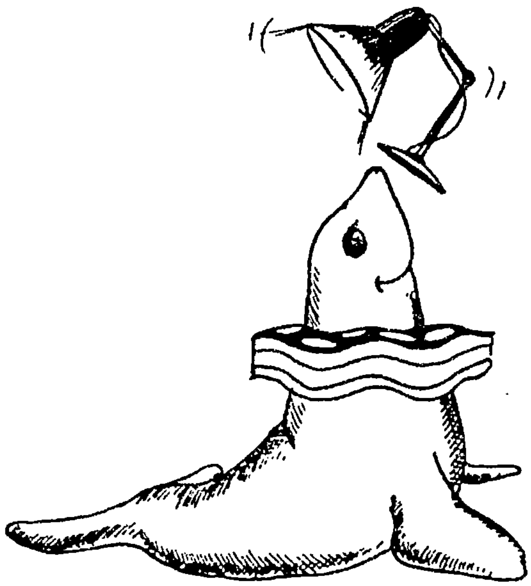


Can you draw a circle round all the capital letters of the alphabet that are **symmetrical**?

A B C D E F G H I J K L M

N O P Q R S T U V W X Y Z L5

L6	Mirror Magic



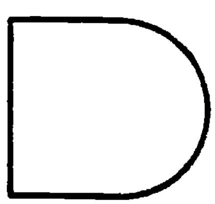
You Need.

a flat sided mirror

What to do:

Can you use your **mirror** to make this skipping rope **longer**? Can you make it **shorter**? **How**?

Can you **change** this shape into a **circle**? What **other shapes** can you make from it?



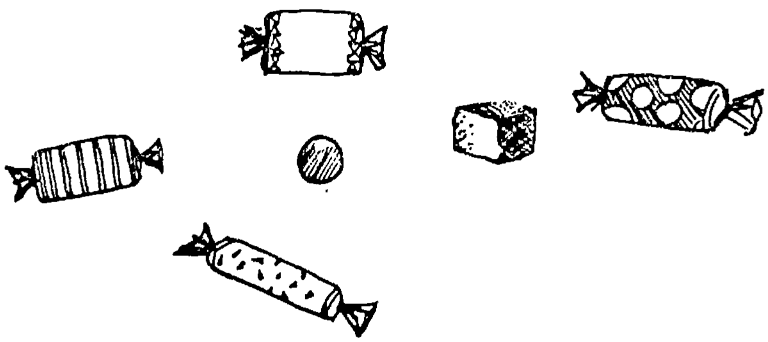
Parents:

Flat mirrors **reflect light** in **straight lines** and give you exactly the **same image** as the original object reflected.

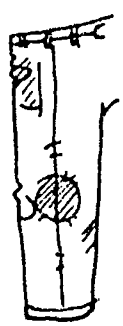
So you can **double** any picture or drawing or any part of it - just depending on where you decide to put the mirror.

Children:

Can you make **more** or **fewer** sweets by **moving** the mirror?

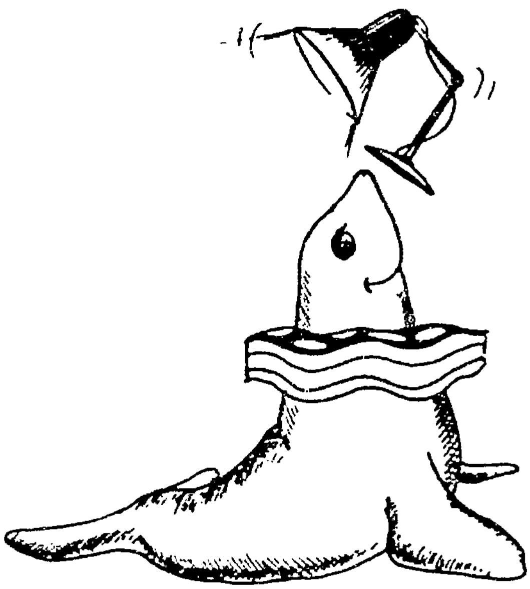


Can you make a **pair** of shoes and a **pair** of trousers?



What can you draw to do the same mirror magic with? L6

L7 Broken Spoon



You Need:

a spoon
a glass of water

What to do:

Put the spoon into the glass of water. **Look** at the spoon carefully. What seems to have happened to it?

In the water it **looks** as though it is **broken**. Take the spoon out and it will look **whole** again.

Find something else to put into the water. Does the same thing happen? **Why** do you think this is?

Write your name on a piece of paper. Look at it **through the water**. What do you notice about your writing?

Draw a monster. Look at it through the water. How can you make your monster grow **bigger**? Now make it grow **smaller**.

Parents:

The spoon looks to be broken because light **travels** in a **straight line** through **air** but **differently** through **water.**

Our view or **image** of the spoon or drawing **changes** because the light coming to our eyes takes a **different path** as it hits the water.

Children:

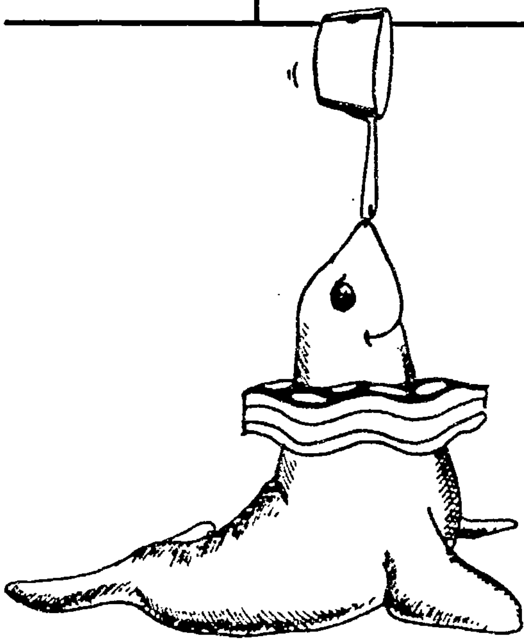
What else did you put into the water?

What did you find out?

You can draw or write about it here.

If you leave the spoon in the water you will notice that **bubbles** have formed on it. What is inside the bubbles? Where do you think it has come from?

H1	Cottage Cheese



You Need:

a pudding spoon full of vinegar
a third of a pint (200cc) of milk

What to do:

Ask a grown up to **heat** the milk for you until it begins to **boil** and then take it off the heat.

Add the vinegar and stir. What **changes** are happening to the milk?

What does it look like now? Some of the milk has changed from **liquid** (watery) to **solid** (lumpy).

Now it is called curds (**solid**) and whey (**liquid**).

Parents:

Heat and other things (eg **chemicals** like vinegar, which is an **acid**) can bring about big **changes** - like turning **liquids** to **solids** or **solids** into **liquids**.

In making cottage cheese, two liquids and heat result in one liquid and one solid.

Talk about heat, liquids and solids with your child - what other examples can you think of?

Children:

What does the curd look like?

What does the whey look like?

Can you **change it back** to milk again?

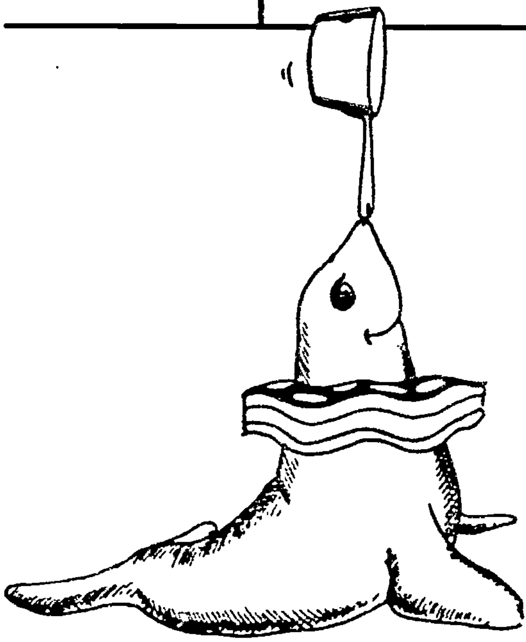
How can you **separate** the curds and whey?

Do you want to taste them?

Can you draw a picture of a little girl who ate curds and whey? What was her name? Why was she frightened?

Do you know anything else that changes from **solid** to **liquid**? **When** and **why** does it do that?

H2	Ice



You Need:

water
freezer or fridge
masking tape or other marker
large margarine carton with a lid

What to do:

Stick a piece of tape on the carton about 4cm (one and a half inches) from the top.

Fill the carton with water exactly to that mark. Put the carton in the **freezer**.

Next day have a look. What has happened to it? Where is the mark now?

How can you change your **ice** back to **water**? **How long** will it take?

Where is your mark when it is all water again?

Parents:

Water **expands** (gets bigger) when it **freezes** and turns into **ice.**

It **contracts** (gets smaller) when it **melts** and turns back into water.

Children:

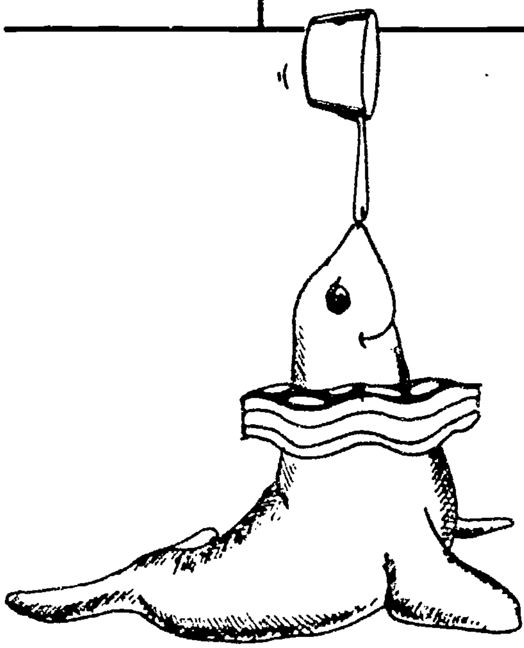
If you filled a carton with water to the very top and put on the lid and then froze it, what do you think would happen?

Will a grown up help you try this?

When the milkman leaves the milk outside your house on an icy cold day, the bottles sometimes look different. Can you say what happens?

Draw or write about it here.

H3	Jacket Potato



You Need:

knife
butter
two plates
oven or microwave
two small clean potatoes

What to do:

Put both potatoes onto plates. **Look** at them carefully. Do they look the same? Do they **feel** the same or **smell** the same?

Ask a grown up to put one potato into the oven or microwave.

When one is cooked, cut both potatoes in half carefully. Do they both **look** the same inside? What **rises** from the **hot** potato? Do they **smell** the same? Do they **taste** the same? Do they **feel** the same?

In how many ways has the hot potato changed? Can you change it back again?

What will happen if butter is put onto both potatoes? Try it. Were you right?

Parents:

Heat **changes** things, including things we eat.

These changes can be in **size, shape, colour** and other features we can **see.** Heat can be **felt,** and can cause **changes** which can be **felt.** It can also cause changes which we can **smell** and **taste** - like in cooking.

Heat can turn water **(liquid)** into **steam** (a sort of **gas**) - like that rising off the hot potato. It can also turn butter (a **solid**) into a **liquid** by **melting** it.

Some of these changes are permanent - they can't be **changed back** or **reversed**.

Children:

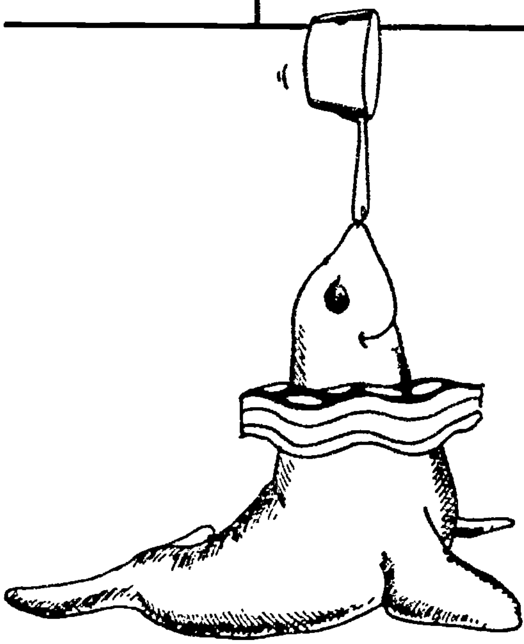
How many different ways car. you cook potatoes?

How is it done?

What is your favourite?

You can write or draw about it here.

H4	Keeping Warm



You Need:

two shampoo bottles
(exactly the same)
large glove, or thick hat or scarf
some hot water

What to do:

Ask a grown up to help you fill each plastic bottle with **hot** water.

Put both bottles outside, but **cover** one bottle with a glove, hat or scarf.

Leave them outside for about twenty minutes.

Guess what will happen to the bottles.

Now feel them. Were you right?

Parents:

Heat **escapes** into the **cooler** air around us unless we **stop** it.

Some kind of **insulation** helps keep heat in.

Clothes help **keep** our body **heat in** - they insulate us.

Children:

Can you find anything else to cover your bottle with?

Why is the covered bottle always **warmer**?

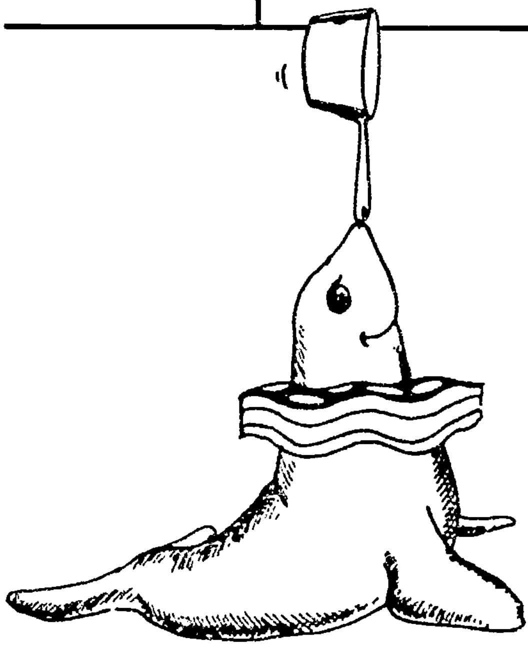
Why do you wear more clothes on a **cold** day?

Test to see how good they are at **keeping heat in.**

You can draw and write about them here.

HEAT

H5 What Melts?

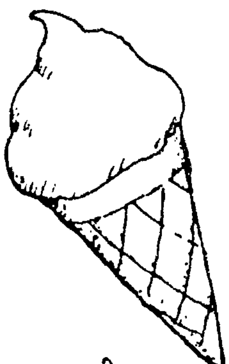


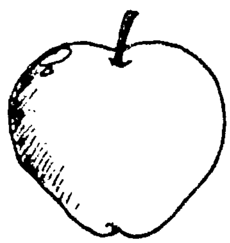
You Need:

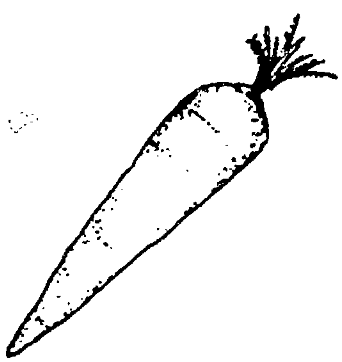
chocolate
an ice cube
butter or margarine
three yoghurt cartons
three dishes
hot water

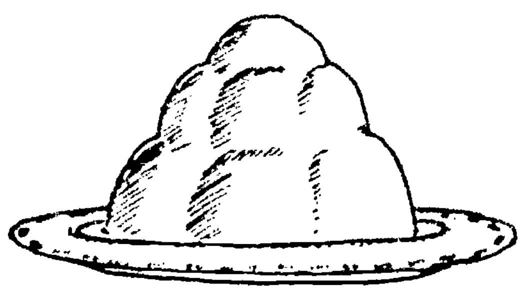
What to do:

Colour the pictures. Put a ✓ next to the ones that will **melt**.









Put a square of chocolate, an ice cube and a small lump of butter or margarine each into a separate yoghurt carton.

Stand each carton in a bowl of **hot** water, all at the **same time**, so the **test** is fair.

What happens? Which **melts** first? Which takes **longest** to **melt**? What has made them melt? Do they look **different** now that they have melted into **liquids**?

Can you change them back to a **solid** again? What about the ice cube?

Parents:

Heat causes **melting** in some substances.

This is a change from **solid** to **liquid**.

Removing heat usually causes a change back to **solid** - but the **shape** will have changed!

Children:

Have cheese on toast or pizza for supper.

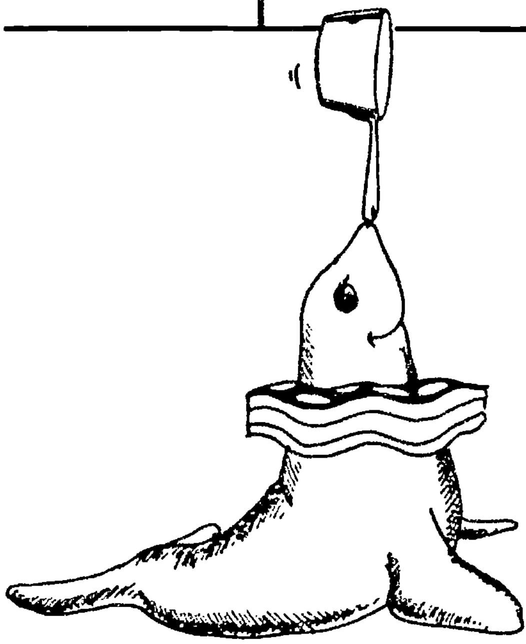
What happens to the cheese on top when it is **heated**?

Do any other foods do this?

Draw or write about them.

HEAT

H6	Toast



You Need:

two slices of bread
toaster or grill
two plates

What to do:

Put both pieces of bread onto plates.

Look at them carefully. Are they both **the same**? Do they **feel** and **smell** the same?

Ask a grown up to put one piece of bread into the toaster or on the grill for you.

What happens to it now? How does it **change**? Why has it changed? Can you **change it back** again?

Look at the toast and the bread carefully. Do they **look** the same? Do they **smell** or **feel** the same?

Bite each piece - do they **sound** the same or **taste** the same?

Parents:

Heat **changes** things, including things we eat. These changes can be in **colour** or other features we **see**, in **feel**, **smell** and **taste**.

Some of these changes are **permanent** - they can't be **changed back** or **reversed**.

Children:

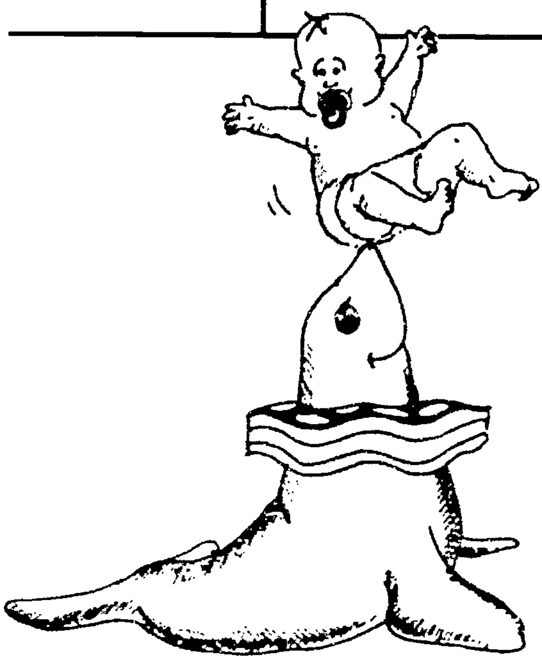
Can you draw or write about the things you like to eat with toast?

You could cook bread other ways, but it might not end up as toast.

What **kind** of cooking **heat** is needed to make toast?

MYSELF

MY1	Goldfish Bowl

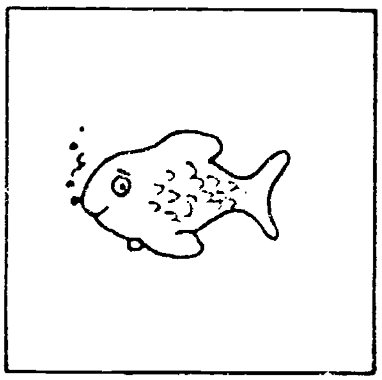


You Need:

thick card
pencil
crayons or felt tips
sellotape
glue

What to do:

Colour the fish orange and the water in the bowl blue.



Cut out the squares and stick them onto both sides of a piece of card. Sellotape the card onto the end of a pencil. Now hold the pencil between two flat hands and rub hard so that the card **spins**. Look at the card. What do you see? Spin quickly, spin slowly - does it make a difference? **Why** do you think this is?

Parents:

Our eyes and brain keep **pictures in our mind** after things have actually changed.

The **images** of both fish and bowl are retained so we see the fish in the bowl.

Children:

Can you make a different spinner?

Draw a bird and a cage. How fast should you spin it so the bird seems to be in the cage?

Can you think of other things to draw on a spinner?

MY2 Kim's Game

You Need:

six different objects
a blindfold

What to do:

Look carefully at the objects for one minute, then look away and ask a friend to take away one secretly.

Look back - can you **remember** which one has gone? Do this again until all the objects have gone. Did you get them all right?

Now it's your friend's turn to guess.

Now play the game again, blindfolded. Now you must **feel** which objects are still there. Can you tell which one has been taken away now?

Parents:

In this game children are learning to **look** carefully and **feel** carefully. These are both important **senses**. They are also practising **remembering - memory** is very important in life.

Can you think of times in your life when looking, feeling and remembering are particularly important?

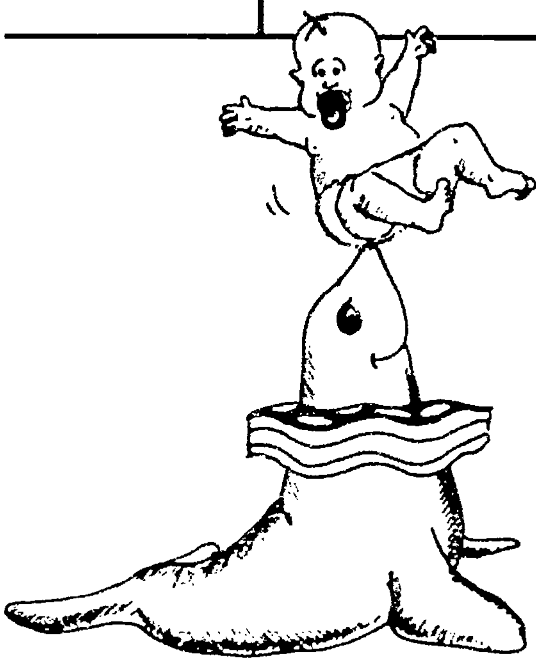
Children:

Can you draw the objects you felt in the blindfold game?

Which was the easiest to guess?

Which was the most difficult? Why?

MY3 Smelling & Tasting Game



You Need:

a blindfold
orange
banana
soap
toothpaste
coffee
cheese
apple
pear

What to do:

Wear the blindfold. Ask a friend to hold the different things close to your nose. Can you tell what they are by **smelling** them?

Now wear the blindfold and hold your nose. Ask your friend to give you a piece of pear and a piece of apple. Can you tell which is which?

Taste them again without holding your nose. Does being able to **smell** help you to **taste**?

Parents:

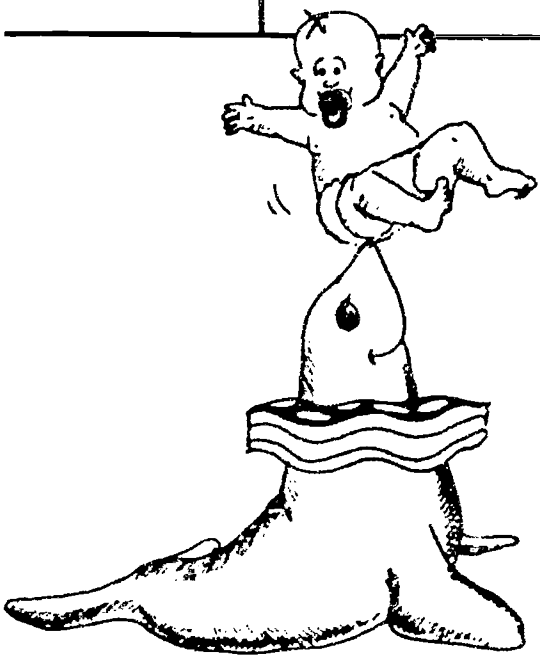
Taste and **smell** are closely connected **senses**. Being able to smell food helps us to tell difference in taste as well.

Children:

You can write or draw about your favourite smell here.

What smell do you dislike?

MY4 Yoghurt Pot Telephone



You Need:

two yoghurt cartons
length of string

What to do:

Make a tiny hole in the bottom of each yoghurt carton and thread the string through. Tie big knots in the ends of the string.

Take one pot each and keep the string tight and don't let it touch anything.

Talk quietly into one of the cartons while your friend **listens**. Can they **hear**? Move nearer so that the string is loose. Can you hear each other now?

How does the **sound travel** to your friend?

Try using different lengths and kinds of string. What is the longest length you can use? What is the shortest length? Which is best? Why?

Parents:

Sound is a kind of **vibration**. It usually travels through the **air** around us, by making the air **vibrate**. It travels along the **string** by making the string **vibrate**. If the string is floppy or touching something it won't vibrate.

Children:

Do you think your yoghurt pot telephone would work under water?

Why?

Can people hear anything under water?

What else can sound travel through?

Do you know how to use a real telephone?

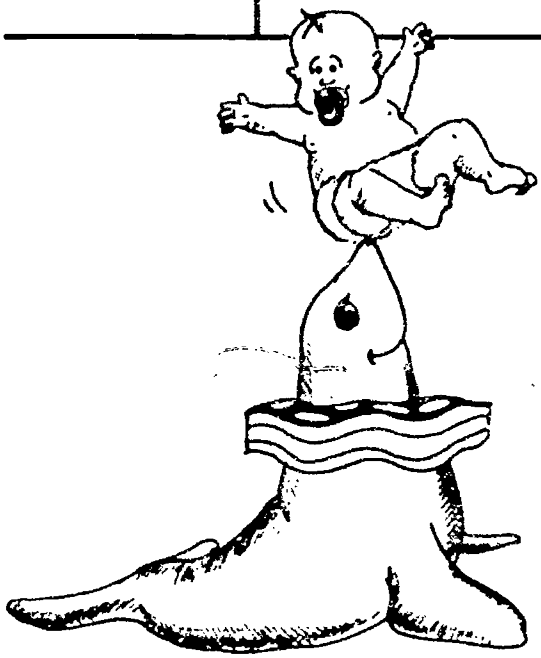
How does that work?

Do you have a telephone?

Do you know your telephone number?

What is the emergency number?

MY5	Listening Game



You Need:

pencil
paper
a blindfold

What to do:

Sit at a table and draw a picture. **Listen** to the **sound** your pencil makes on the paper.

Put your ear onto the table. Draw again and listen to the sound. Which was the **loudest**? Does the sound **travel** to your ears better through the **solid** table or through the **air**?

Wear a blindfold and ask a friend to walk quietly towards you. Can you hear footsteps?

Now put your ear to the ground and try again. Which sounds the loudest? Does sound **travel** better through the floor or through the air?

Parents:

Sound can **travel** better through **solids** and **liquids** than through **air**.

Children:

Red Indians were very good at hearing far away sounds. They would listen for the sound of galloping horses by putting an ear to the ground.

Can you draw a picture about this?

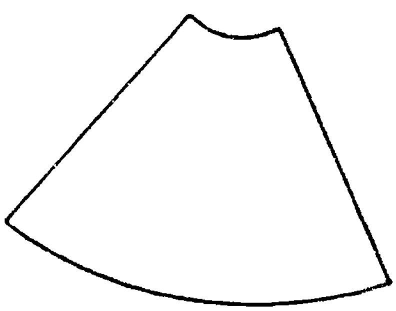
MY6	Big Ears

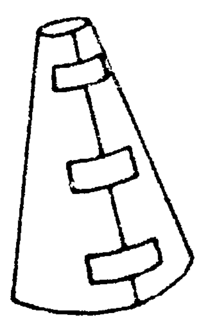
You Need:

ticking clock or watch
stiff paper or card
sellotape
pin
plate

What to do:

How far away can you **hear** the ticking of a clock or watch? Cover each ear in turn. Is it the **same distance** for each ear? Now make yourself a 'big ear'. Cut out this shape from a large piece of stiff paper and roll it into a **cone**.





Tape the edges together. Do large ears help you to hear sounds better? **Why?**

Parents:

Sound **travels** through the **air** by **vibrating** the air. A "big ear" **collects** more **vibrating air** and **concentrates** it into the ear.

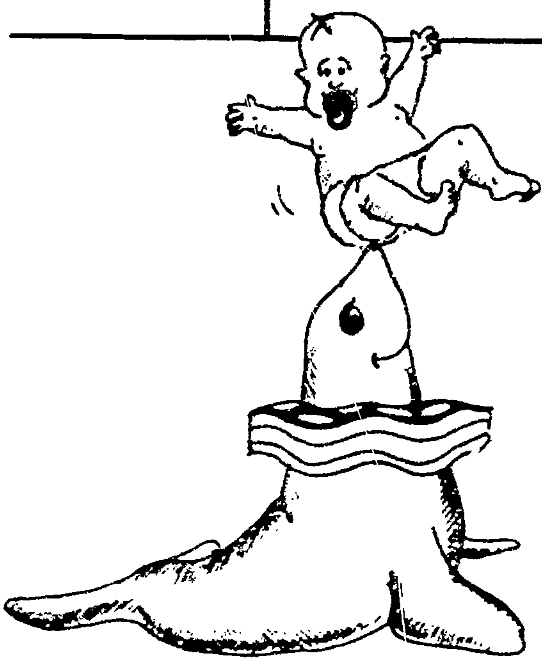
Animals with big ears usually have better hearing than those with small ears. The flap of your ear is to **collect** sound **waves.**

Children:

Ask someone to drop a pin onto a plate. Can you hear the sound better with your 'big ear' or without it?

Can you draw an animal that has big ears?

MY7	Feely Bag



You Need:

gloves
pillow case
six objects

What to do:

Ask a friend secretly to hide six different objects in a pillow case.

Put your hand in the bag and **feel** one **without looking**. Can you **describe** it so well that your friend can guess what it is?

Now do it wearing gloves. Can you still feel what the objects are?

Parents:

Encourage as full a description as possible, not just one word, like "big" or "soft".

Usually we take the **sense of feeling** for granted, but it is very important.

Children:

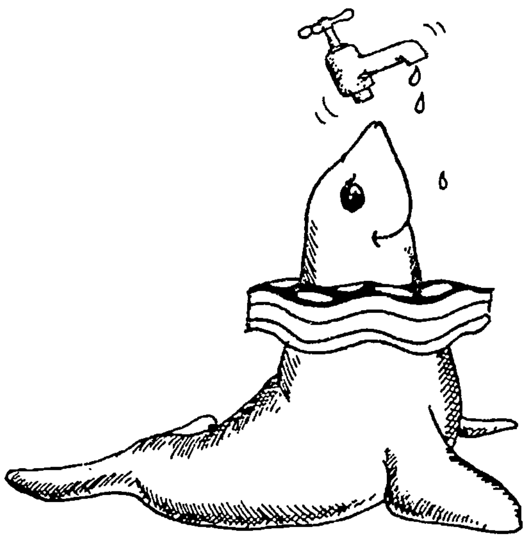
Try feeling with your feet instead of your hands.

Which is best? **Why**?

When would a sense of feeling be especially **important** - for what kinds of people?

You might draw or write about your answers.

W1 Carrot Tops



You Need:

water
two saucers
the tops from six carrots

What to do:

Put three carrot tops on one saucer and three on the other. Put **water** on one saucer and leave the other **dry**.

Put both saucers on the windowsill and leave them for a week.

If you make sure that the wet carrot tops always have plenty of water, they will begin to **change**. What happens to them?

Does the same thing happen to the dry carrot tops? How are they **different**?

Parents:

The **wet** carrot tops **absorb** water which encourages **growth.**

The **dry** carrot tops **lose** water and shrivel up.

Water is essential for growth (**plants** need **light** as well).

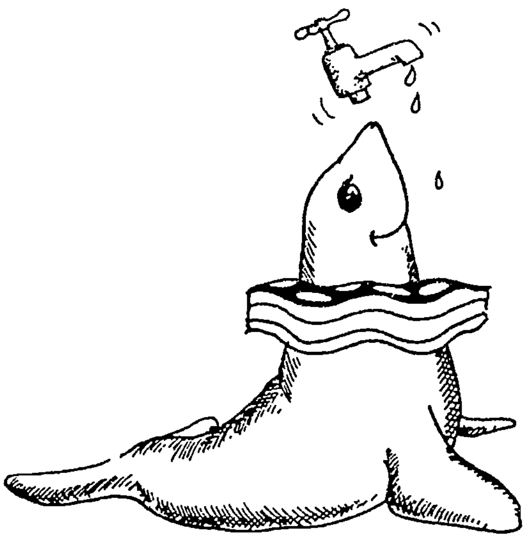
Children:

What did you find out about water?

What would happen if the wet and dry carrot tops were kept in the **dark**?

You can draw and write about it here.

W2 Dissolving



You Need:

salt
sand
sugar
flour
coffee
soap powder
warm water
a teaspoon
6 glasses or jam jars

What to do:

Can you guess what will happen when a teaspoonful of each of the six **substances** is put in to a separate jar of **warm water**?

Will they **dissolve** (turn into wet sloppy **liquid**) or not? Guess first and then find out.

Use the same amount of water and substance each time, and stir each one 20 times. Which solid substances can you still see? They have **not dissolved.**

Which ones have disappeared? They **have dissolved.**

Did you guess correctly each time?

Parents:

Some **solid** substances **dissolve** in water, making a different kind of **liquid**. Others do not.

The **temperature** of the water makes a difference with some substances.

Children:

You can write down what happened like this:

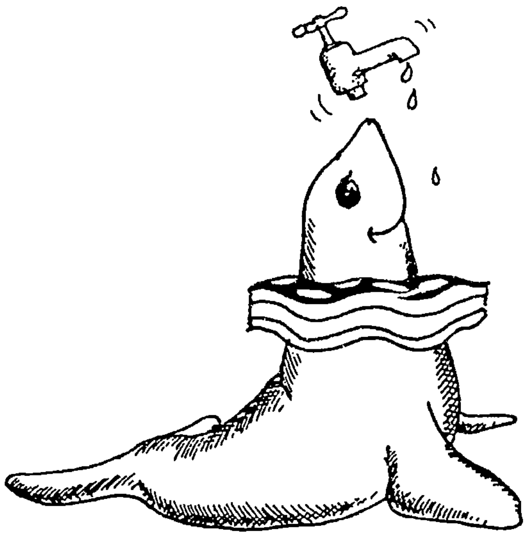
I Tried	I Guessed	What Happened
sugar		
salt		
sand		
coffee		
soap powder		
flour		

Try using cold instead of warm water.

Does it make any difference to the way things dissolve?

W2

W3	Steam



You Need:

a duster
a wash basin or bath

What to do:

Polish the taps so that they are really **shiny**. Do both taps **look** the same? Do both taps **feel** the same?

Put the plug in and run the water as you usually do to get washed. What can you see **rising** from the water?

Look at the taps again. Do both taps look the same now? Are they both shiny? Touch the **cold** tap. What is on the tap now? What can you **feel** on your finger?

Why did one tap change and not the other?

Parents:

Hot water gives off **steam**. Steam changes back to water again when it touches a **cold** surface. We call this changing back **condensation.**

Explain what steam is made of. (It is tiny droplets of hot water suspended in air).

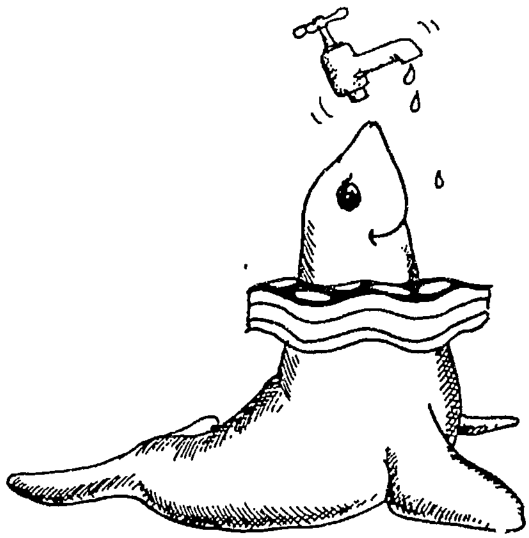
Children:

Can you find any more places in the bathroom, kitchen or other rooms that get **condensation** on them?

How has the condensation got there?

You can draw or write about it here.

W4	Rising Water



You Need:

water
a glass jar
a rubber band
a ball of plasticine

What to do:

Put the rubber band around the jar. Fill the jar with water to the **level** of the band.

What will happen to the water level when the plasticine is put into the jar? Will it **change** or **stay the same**? **Guess.**

Now **test** it. Were you right?

Find other **heavy** things to put into the water. Guess first whether the water will change a little or a lot.

What happens when you take the object out again? Can you explain what is **happening** to the water each time something is put into the jar?

Parents:

When objects which **sink** are put into water they **push out** or up (**displace**) an **amount** of water the **same** as their own **size** or **volume**. (Objects which **float** displace a smaller amount of water).

Children:

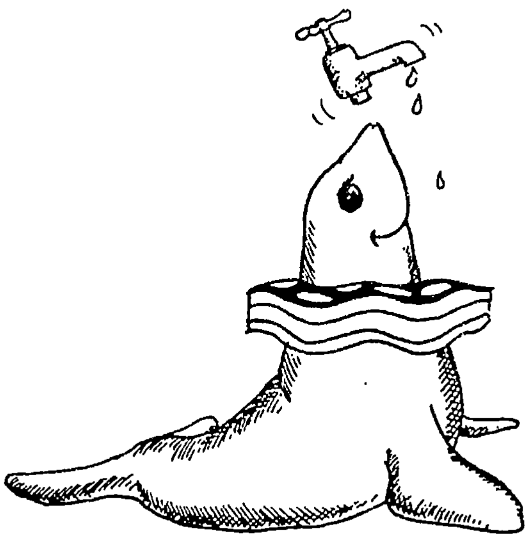
What happens to the water level when you get into the bath?

What happens when two people get into the bath together? How could you make a jar or bath overflow?

You can draw or write about it here.

WATER

W5	Evaporation



You Need:

cling-film
rubber band
kitchen roll
2 yoghurt cartons

water
2 saucers
a teaspoon

What to do:

Wet 2 pieces of kitchen roll and put each into a separate yoghurt carton.

Cover the top of one of the cartons with cling-film. What do you think will **happen**?

Will both the pieces **stay the same**?

Now try something else. Put one teaspoonful of water onto each saucer.

Leave one saucer in a **warm** place and put the other in a **cool** place.

What will happen? Will they both **stay the same**? Why?

Parents:

Left **exposed** to the **air**, water slowly "dries up". What really happens is that the **water** turns into **water vapour** and **escapes** into the **air**.

This happens faster if the air and/or water are **warmer**, and is called **evaporation**.

('Evaporated' milk has had some of the water content of ordinary milk removed in this way, so what is left behind is **thicker** and more **concentrated**).

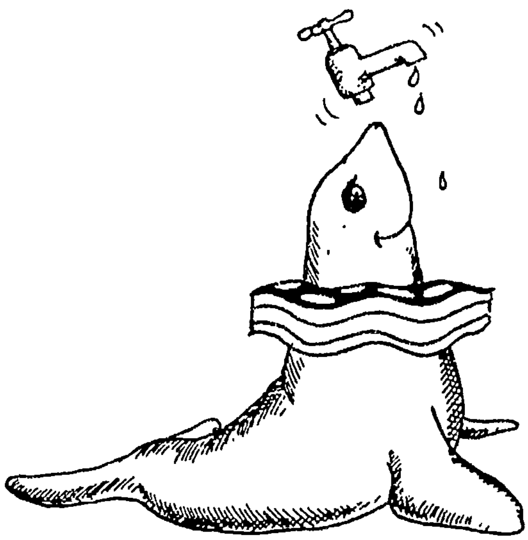
Children:

What happens to the water? Where does it go?

Where do puddles go after rain?

You can draw or write about it here.

W6	Rust



You Need:

water
a nail
a button
a matchstick
3 yoghurt cartons or jars

What to do:

Put each object into a separate carton or jar of water.

What happens to the matchstick? Does it **do the same** as the button and the nail?

One of these 3 objects will **change** if we leave it long enough in water. Can you guess which it is?

What do you think will happen to it? What is this object **made of**? Why doesn't the same thing happen to the other objects?

Parents:

When **iron** is in contact with **water** it gradually **rusts**, which means the iron **combines** with **oxygen** in the water or '**oxidises**' to make a new substance (rust).

Some other metals oxidise, but no other metal oxidises as much as iron in water (brass, lead and zinc do not rust for example).

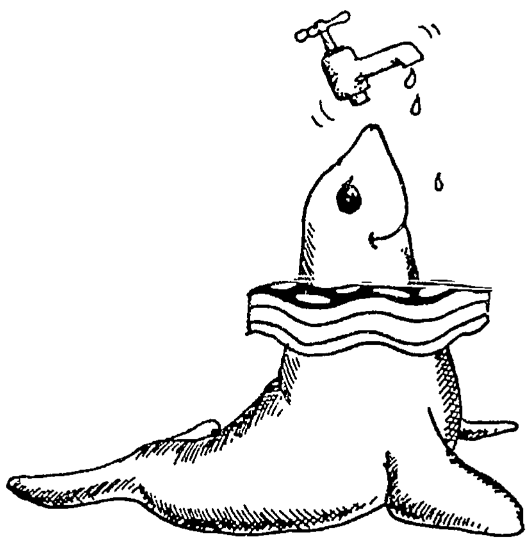
Children:

What would happen to your bike if you left it out on a rainy day?

What if you left out a steel screw and a brass screw?

You can draw or write about it here.

W7 Floating and Sinking



You Need:

soap
penny
potato
paper
apple
a stone
wooden peg
lump of plasticine
a metal spoon
milk bottle top
bowl of water

What to do:

Guess which of the **objects** will **float** and which will **sink.**

Sort them into two sets. Draw them.

FLOAT	SINK

Now test them all by putting them in water.

Put a ✓ if you were right, a ✗ if you were wrong. **Why** do some **float** and some **sink**?

Parents:

Whether things **float** or **sink** does not just depend on how **heavy** they are.

It depends on their **density** and **shape**.

The **density** of an object is its **weight in relation to its size** (a penny is **heavy for its size** and sinks, but a tree trunk is **light for its size** and floats).

Also, **shape** is important - **hollow** shapes which can **hold air** and keep water out are more likely to float - like boats!

Objects that **displace** lots of water in relation to their own weight float better.

Children:

What did your lump of plasticine do - float or sink?

Can you change the shape of the plasticine so that it will float better?

What other **experiments** can you do with floating and sinking?