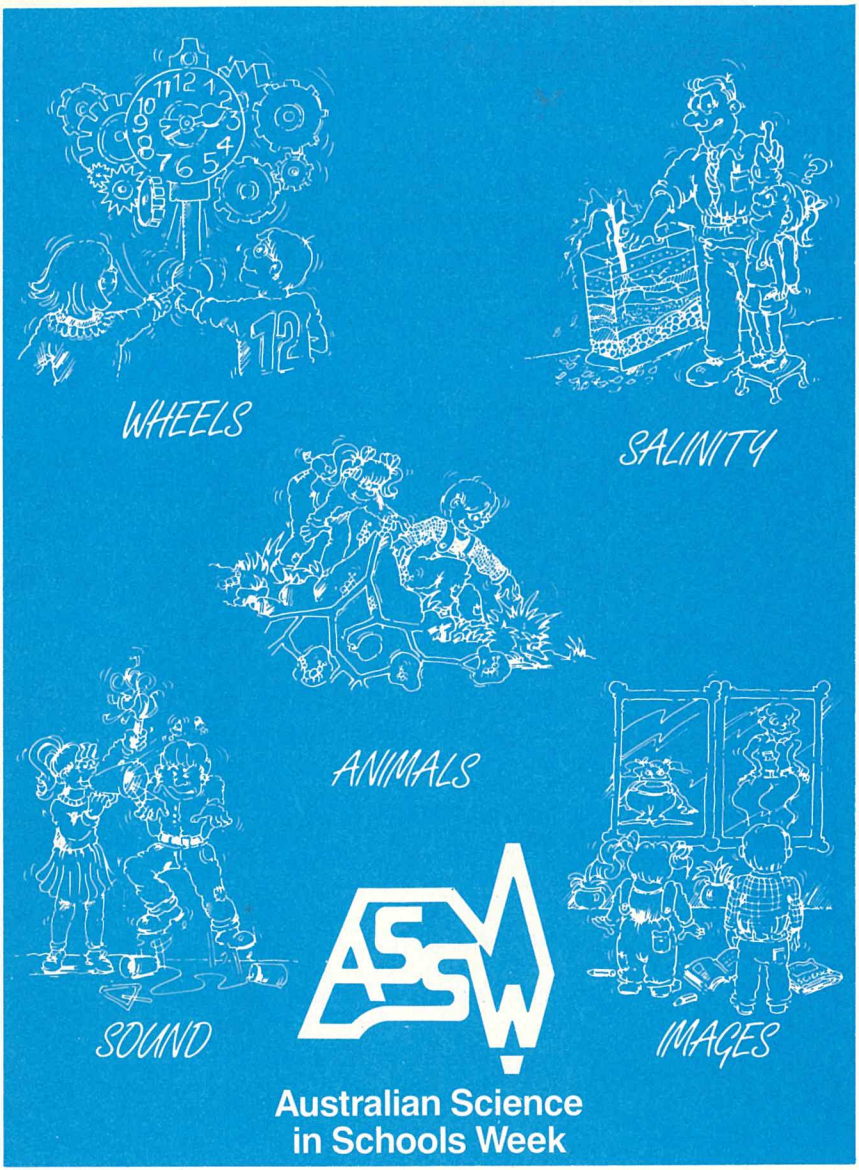
RESOURCE BOOK

Sponsored by STANSENS, CSIRO, BHP, CRA, LEGO, SHELL, ASTA.



19–23rd October 1987

AUSTRALIAN SCIENCE IN SCHOOLS WEEK
19–23rd October 1987

Australian Science in Schools Weeks aims to

- focus community attention on Science and its importance in the school curriculum
- promote the image of Science
- involve students in a broad range of Science-related activities
- promote Science as being fun

Activities for this resource book were contributed by our sponsors and science teachers across Australia

Publisher
Australian Science Teachers Association.
Printed by
William Brooks Queensland., Eagle Farm, Brisbane. Q.

ISBN 0 7316 0723 6

CONTENTS

The text of this publication has been prepared using an Apple Macintosh Computer supplied by J. Donegan of The Byte Shop, Park Road, Milton. Telephone: (07) 369 4099.

AUSTRALIAN SCIENCE IN SCHOOLS WEEK
19-23 OCTOBER 1987

(An initiative of the Australian Science Teachers Association)

A MESSAGE FROM THE NATIONAL ADVISORY COMMITTEE

It is a salutory reminder of the rapidity of change to note that it is only three short years since the first ASISW Resource Book arrived in schools. Brenton Honeyman, then President of ASTA , described Australian Science in Schools Week as " one of the most exciting projects that ASTA has undertaken". The foundation National Director, Don Hyatt, wrote in the preface of the first Resource Book that its aim was to " stimulate the imagination and to provide a few directions".

Those hopes have been amply fulfilled. From tentative beginnings has grown a major celebration of the importance of science education which is already an institution in the annual program of many schools.

In many ways, the members of the National Advisory Committee see themselves as a microcosm of one of the major aims of ASISW. We are not directly involved in science education but are deeply committed to its value. ASISW is about science teachers reaching out into the community to convince others of the importance of what they do. Members of the National Advisory Committee and the companies and institutions they represent are proud to support teachers and children in this vital task.

This Resource Book contains suggestions which will stimulate many intruiging and enthralling activities before and during the week. No doubt it will then join its predecessors on teachers' bookshelves as an enduring educational resource. The contents of the book are deliberately wide ranging. Activities have been included to appeal to learners of all ages and levels of sophistication. Some involve the use of 'scientific' equipment; others require nothing more than household items. The vital ingredients common to all are a child's passion to ask questions and to investigate, and a teacher's concern and understanding. I am confident that during this week,these attributes will be found in classrooms, laboratories and schoolgrounds all over Australia.

STANSENS

R.O. Thomas.

Rob Thomas
Manager, Scientific Division
Stansens

AUSTRALIAN SCIENCE IN SCHOOLS WEEK

19TH - 23RD OCTOBER 1987

NATIONAL POSTER COMPETITION

The poster competition was very succesful in 1986 and State Coordinators believe that this activity is essential to the success of ASISW and the promotion of Science. ASISW relies upon science teachers and their enthusiasm to make this week the success it is and we look forward to your continued support and encouragement. For 1987, our competition includes the 'traditional poster' and a completely new section, **'Computer Generated Posters'.**

Five 'traditional ' posters and two computer-generated posters in each category will eligible for entry in the National Judging. Entries for the National Finals should reach Darwin by mid-August.

We are pleased to announce that ASHTON SCHOLASTIC and HEINEMANN have kindly agreed to award prizes to the National Winners in each category.

CATEGORIES:

Primary - Traditional and Computer-generated
Secondary - Traditional and Computer-generated

TOPICS:

- **SCIENCE BEYOND 2000**
- **SCIENCE AND YOU**
- **SCIENCE AND THE QUALITY OF LIFE**

JUDGING GUIDELINES:

- **Communication of message**
- **Technical execution**
- **Design**
- **Creativity**

REQUIREMENTS:

Posters should be approximately 30cmx40cm in size and should incorporate the ASISW logo in some way. The posters should aim to promote some aspect of ASISW and should be colourful and appealing. All posters should be of original design and contain a simple slogan or message.

POSTERS SHOULD REACH STATE COORDINATORS BY 31ST JULY 1987.

SPEAKERS SCHEME

Australian Science in Schools Week provides a special opportunity for teachers and students to meet women and men in Science-related occupations and to learn more about Science in the work-place and its importance to our society.

Many scientific organisations have been approached and are keen to be involved in the Speakers Scheme. Your ASISW State Coordinator has an up-to-date list of contacts who will arrange speakers for you.

Alternatively, establish your own contacts with people working in Science-related fields. It is not difficult to find women and men in your locality who use Science as an everyday part of their work. Try places such as:

- meteorological office
- wildlife reserve
- dairy factory
- pharmacy
- forestry station
- sewage treatment plant
- dental surgery
- hospital
- Telecom office
- geological field station
- abattoir
- garden centre
- fire station
- Pastures Protection Board

In addition, contact can be made with scientists working in universities, colleges of advanced education, CSIRO divisions, and large companies such as BHP, CRA, Shell, BP, etc.. Scientific societies such as the Australian Academy of Science, the Australian Institute of Physics, the Institute of Engineers Australia, the Royal Australian Chemical Institute, etc., can provide advice on speakers from within their membership.

Here are some ideas for you

- Arrange a visit to the work-place of a scientist or someone in a Science-related occupation so that your students can observe how Science is part of that person's everyday work.
- Invite a person in a Science-based career to visit your school and speak to your students about the role of Science in that occupation. Some speakers may have slides or a film to illustrate their work.
- Where access to practising scientists is difficult, organise your students to write to scientists asking them to respond to a few questions about their profession so that these can be shared in a special lesson during Australian Science in Schools Week.
- Arrange a series of visits to local places where Science-based careers can be seen in action. This will help your students to appreciate how Science is an important part of many careers.
- Set up a special area for a scientific display and regular demonstrations at lunchtimes during Australian Science in Schools Week. Students from local primary schools and parents could be invited to visit the display and to observe some spectacular and intriguing demonstrations. Invite a local scientist to give a brief address on the importance of studying Science at school.
- Organise a travelling Science show and visit neighbouring primary schools, shopping centres, etc.. Invite a local scientist to give a brief address. The show could also include several 'magical' demonstrations of scientific principles.
- Invite a local scientist to speak briefly at a school assembly during Australian Science in Schools Week on the occasion of launching your school's ASISW activities, presenting Science awards, etc.

Brenton Honeyman
Speakers Scheme Director

SHELL SCIENCE FELLOWSHIP 1987/8

Since 1985, two Australian students and a teacher have been awarded the Shell Science Fellowship to attend the Singapore Youth Science Fortnight in May/June. This prestigious award is sponsored by Shell Australia and is conducted in association with the Australian Science teachers' Association through Australian Science in Schools Week. The 1987/8 Shell Science Fellowship winners will participate in the activities of the Singapore Youth Science Fortnight as a link with Australian Science in Schools Week. They will also have the opportunity to spend time in the fabulous singapore Science Centre and to take part in a science camp for students.

STUDENT FELLOWSHIP

Students in years 9 or 10 in 1987 may apply for the trip to occur in 1988. They should firstly complete an "application of scientific principle" - i.e. produce an invention or working model. This is best achieved by entering the science competition, talent search or science fair conducted by the State Science Teachers' Association. They should then submit an application on the form available from the state Australian Science in Schools Week co-ordinator. Each state will select two students and nominate them for national selection. The state selection will be based on:

1 The quality of the model or invention as a scientific principle application (not its cost)
2 The academic ability of the student
3 The interest in science, at present and as a career
4 The general suitability - communication ability, wide interests etc.
5 A personal interview (at the discretion of the state co-ordinator)

The national selection will be based on criteria 1 to 4 above and an interview report. The national selection will be made by representatives of Shell Australia and A.S.T.A.

TEACHER CHAPERONE

Each state association will nominate one person for selection as chaperone for the trip. Interested teachers should submit an application on the form available from their state Australian Science in Schools Week co-ordinator. The selection of the chaperone for the 1988 trip will be made by representatives of Shell Australia and A.S.T.A and the Australian Science Teachers' Association. The selection will be based on:

Involvement in science education activities/associations
Involvement with Australian Science in Schools Week
Knowledge of, interest/expertise in, current science education issues
General suitability as representative of Australian science teachers internationally

APPLICATIONS

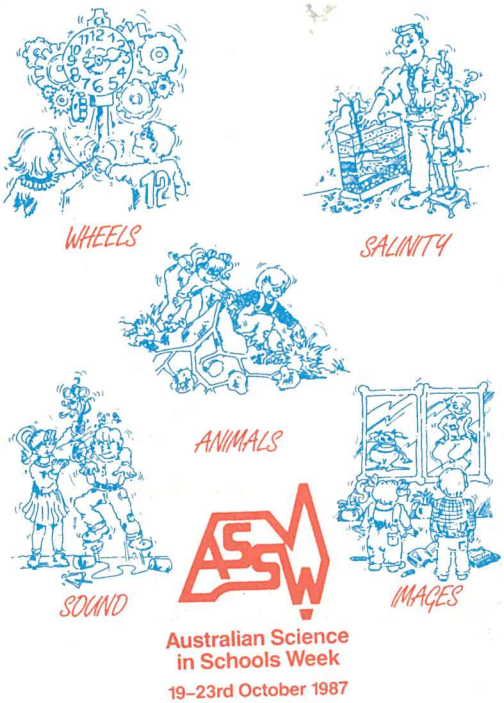
Applications are invited on the forms available through your state Science in Schools Week co-ordinator. Please check with your state co-ordinator for your state closing dates. Late applications can not be considered, as the announcement of the recipients will be made during Australian Science in Schools Week, 1987.

If further information is required, please contact your state co-ordinator or

Keith Money
Aspley State High School
Zillmere Road
ASPLEY Q 4034.

DESIGNATED ACTIVITY DAYS

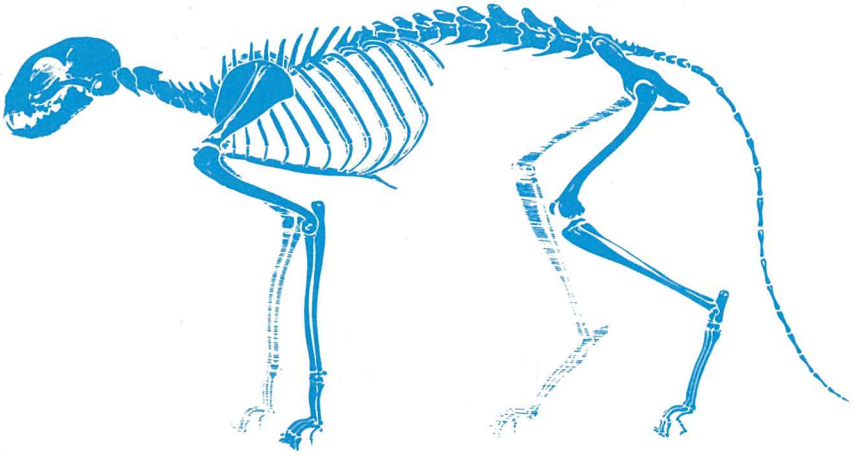
The acronym **ASISW** has again been used to select appropriate themes for each day's activities during Australian Science in Schools Week. As students, teachers and communities participate on these days, they will know that others across Australia are joining in similar activities in similar ways.



The activities suggested in this booklet are not intended to be the only ones carried out during Australian Science in Schools Week. Some may need to be modified in the light of resources, the age of the children and availability of personnel. These activities are representative of the type of activity that might be undertaken by children across the years from pre-school to Year 12. They have been chosen because they are stimulating and enjoyable and have the potential to involve all students. In addition, they are seen to promote a positive image of Science.

ANIMALS

Don't let this happen prematurely to your Felis Catus, or other animals . . .



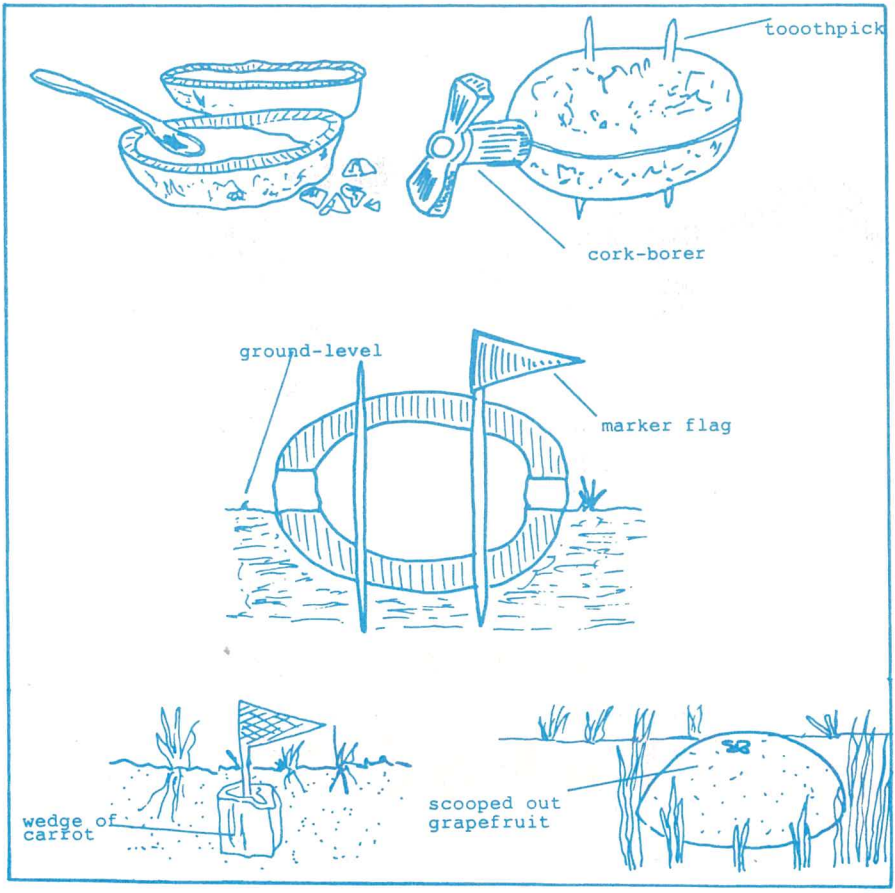
. . . look after them well!

ANIMAL TRAPS

There are many ways to collect small animals for study. Some of these are described on this page.

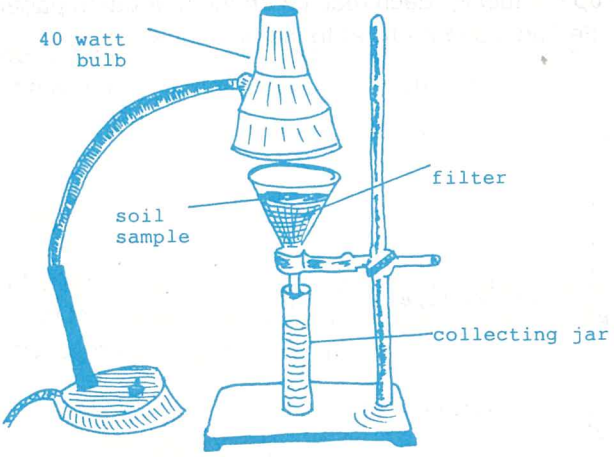
Obtain a large potato and slice it into two parts along its length. Scoop out the fleshy part of each half. The potato can be rejoined using toothpicks. The hole through which the animals enter the trap can be carefully cut with a knife, or drilled with a cork-borer. Next, have the children half bury the potato in various parts of the school grounds, marking them with small flags as shown. The traps should be left undisturbed for several days after which the children should investigate and record the different animal types found.

Do different areas of the school grounds support different animals?



ANIMAL HOMES

Animals live in a variety of places, including the soils of the Earth. Children can investigate the animal life in the soils of a particular area using the equipment shown.



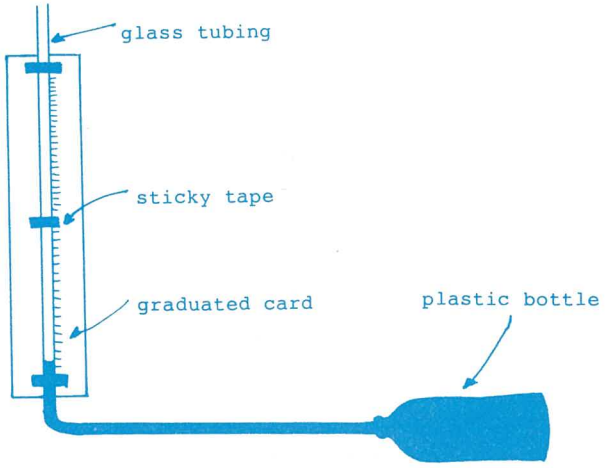
Have the children collect samples of soil from different areas of the school grounds; about a jam-jar full is sufficient.
Some of each sample should be placed into the filter funnel, placed above a collecting jar.
When the lamp is turned on, the children should look for small animals moving away from the light (and its heat). They will fall into the collecting jar. From here they may be carefully removed for observation with a hand lens or similar.

(As with all activities involving the use of live animals, they should be returned to their homes as soon as possible. The animals are for observation only.)

MUSCLE STRENGTH

Construct an apparatus like that shown in the diagram.

Explain to the children that this investigation is to find out if a person's strength differs from one hand to the other. The test is to squeeze the bottle firmly with one hand to force the coloured water as far as possible up the tubing. Each reading on the graduated paper strip should be recorded on a sheet similar to the one shown:



	RIGHT HAND Height in centimetres			LEFT HAND Height in centimetres			
NAME:	1st	2nd	3rd	Average	1st	2nd	3rd	Average

Discuss with the children how to conduct the investigation. For example, the water level will have to held for two seconds before being counted.To achieve more useful results, each child should do the test three times.

This procedure is then repeated with the other hand.

SKELETONS

Have the children cook a whole chicken or fish for lunch one day. With care, they should be encouraged to discover and explore the skeleton underneath.

PET SHOWS

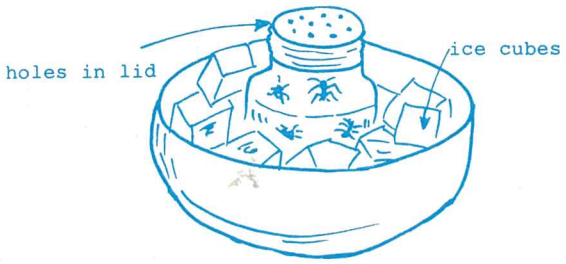
Children could be encouraged to organise a Class Pet Show. This will allow comparisons to be made among the different animals the children keep.

CAMOUFLAGE

Have the children collect pictures of different animals. They should then be asked to choose one, and using collage create an environment around it that camouflages the animal.

ANIMALS AND THE SEASONS

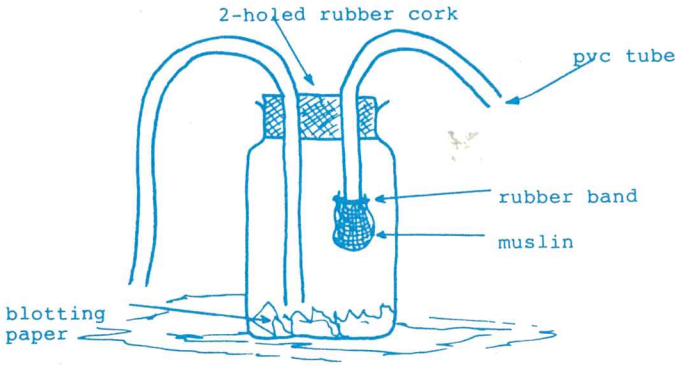
Have the children catch some small insects (flies, grasshoppers) and place them in a jar with holes punched in the lid. Allow the children to watch the insects for a few minutes. Ask questions such as: Do they move quickly or slowly? When do they rest? Where do they rest? Do they rest for short or long periods?



Now place the jar into a bowl of ice cubes for a while. When the insect movements start to slow down, ask the children to describe the changes, eg. moving more slowly, resting longer.
Once these changes have been noticed, take the jar out of the ice cubes.

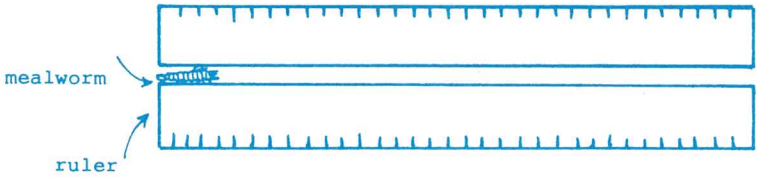
HOW TO MAKE A POOTER

Children can make a simple device for collecting small animals if they study the diagram below: all that is needed is a 2-holed cork, small jar, two lengths of pvc tubing, a piece of muslin and a rubber band.



CAN MEALWORMS SEE?

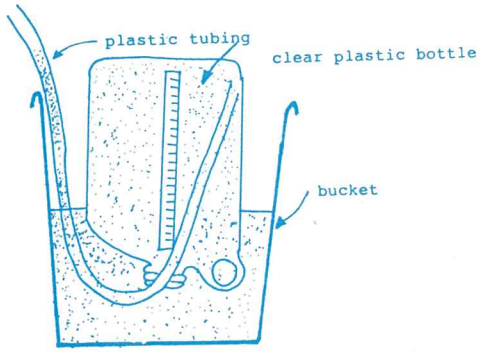
To investigate this problem, have the children perform the following experiment.
Place a mealworm in a shoebox lid. What does it do? What sound does it make as it moves? Place your finger in different places around a worm, but do not touch it. What does it do?



Put the worm beside a ruler. What does it do? Which way does it turn when it gets to the end?
Put a ruler each side of the worm. (Make sure the rulers just touch the sides of the worm and that they are level at the ends, as shown.) What does the worm do this time when it reaches the end? Does it feel its way along or can it see?

LUNG CAPACITY

Mark off a clear plastic container in 100mL or 200mL divisions. This should be done with waterproof inks.
Next, have the children fill the container with water and carefully invert it in a half-filled bucket of water. Care should be taken to prevent bubbles from entering the inverted container.
One end of a plastic tube is inserted into the container, as shown.



A child takes a deep breath and exhales through the tube. The volume of air exhaled can be read in millimetres off the side of the container (to the nearest 50mL). This figure represents the child's lung capacity.

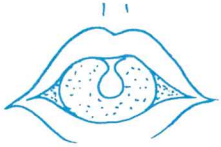
This activity can be repeated with other children, after the tubing has been cleansed properly. An appropriate method of recording should be devised

SNAILS ON THE MOVE

Children might investigate the movement of snails by placing one on a sheet of clear perspex or glass. By looking from the underside of the sheet, it is possible to study the movement of a snail.

TONGUE ROLLING AND FOLDING

Draw up a chart like the one shown. Have the children form pairs with one child asking the other first to roll her tongue, then to fold it. They record their observations.



rolling

folding

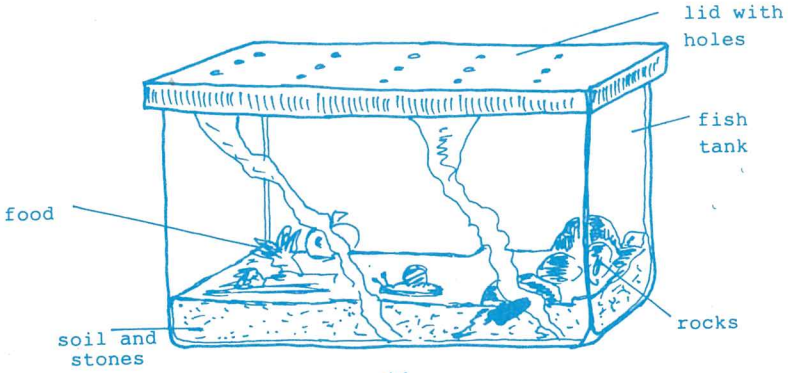
RECORD SHEET:

NAME: Mary Janet Jamie Tarni Duncan Bob Jean
Roll
Fold

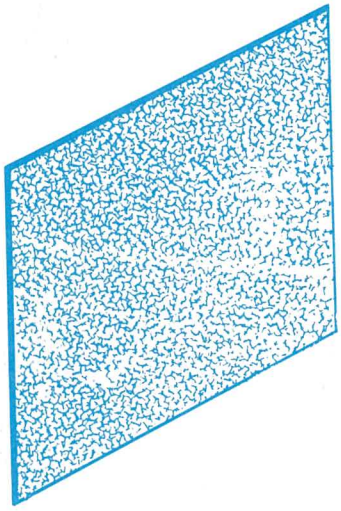
Children will probably raise the question of why some people can fold or roll their tongues and why some cannot. Through discussion establish that these abilities are inherited from their parents.

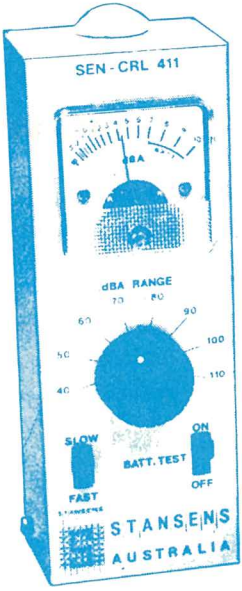
A HOME FOR A SNAIL

An unused aquarium or large glass jar can readily be turned into an ideal home for keeping snails and other small insects. The most important considerations are: food, water, air, space, shelter and temperature. The plan shown has been designed specifically for snails, but could easily be adapted for spiders, stick insects or other small creatures.



SOUND

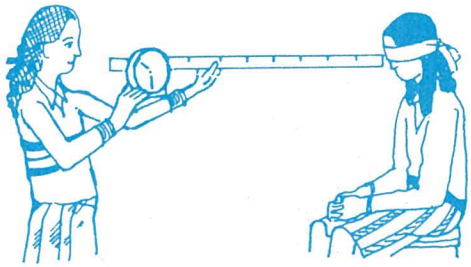




Using a radio, investigate the ability of different materials to absorb and reflect sound.

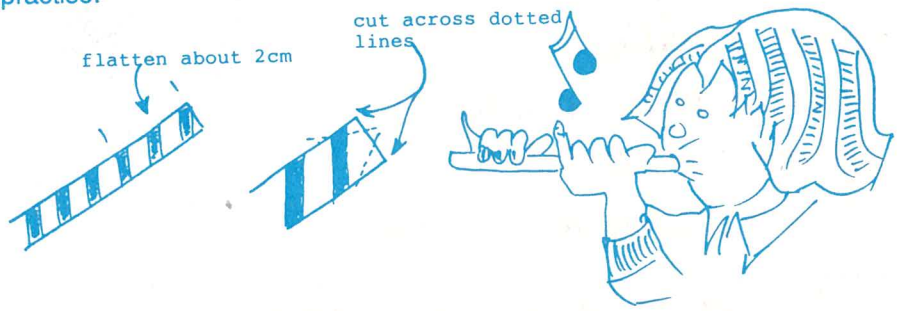
HOW WELL CAN YOU HEAR?

This is an activity ideally suited to groups of children and it requires minimal supervision.
You need only a blindfold ,a stop clock (one that ticks!), and a quiet workspace.
Let children investigate the distance at which they can no longer hear the ticking of the clock.
Alternatively, children could explore differences between the hearing of their left and right ears.



WHISTLES AND STRAWS

Have the children squash the end of a paper drinking straw and snip the corners of the flattened tube. Next they put this end right inside the hollow of their mouth. By closing their lips over the tube and blowing into it, a sound will come from the straw pipe. This may take a little practise.

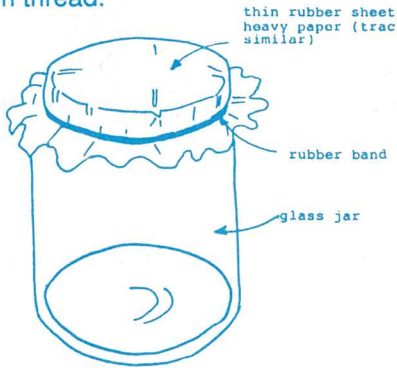


By cutting the straw shorter, children can explore one of the causes of sounds of different pitch.
(A funnel placed over the end of the pipe can create a trumpet-like effect.)

GOOD VIBRATIONS

Let the children find out how sounds are made.

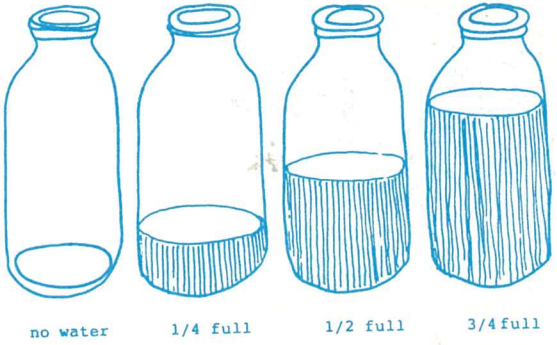
A simple drum can be made by placing tracing paper tightly across the mouth of a jar. It can be fixed in place with a rubber band or piece of cotton thread.



Have the children tap the paper with a pencil.
Next, have them place some rice on the paper and tap it again.
What happens to the rice?
This activity could be repeated using a drum if available. How does the size of the drum affect the sound that it makes?

MUSICAL BOTTLES

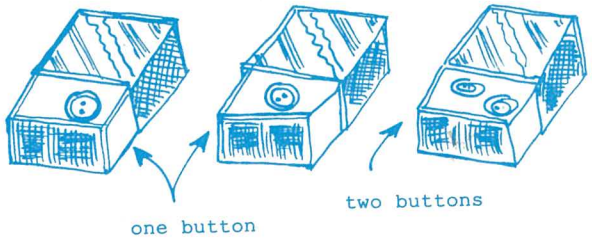
Have the children make a collection of similar-sized glass bottles. They should be filled with different amounts of water as shown in the diagrams.



By tapping the side of each jar, or blowing across the top of each one, children can arrange the bottles in order of pitch.

WHAT'S IN THE BOXES?

Obtain three match boxes. Into two of the boxes, place a single button. Place two buttons into the third.

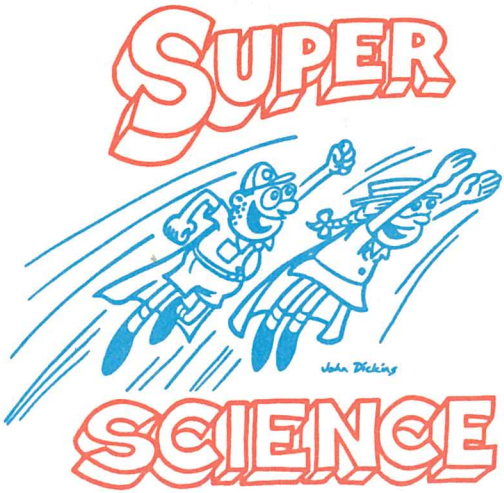


After closing the boxes, have the children shake the boxes and say which is the one with two buttons.

SOUND WORDS?

The words in the list below describe different sounds. Have the children draw a picture to fit each one.

Bang! Cheep Ding! Zoom Whish
Crash Crack Pow! Buzz Clang!

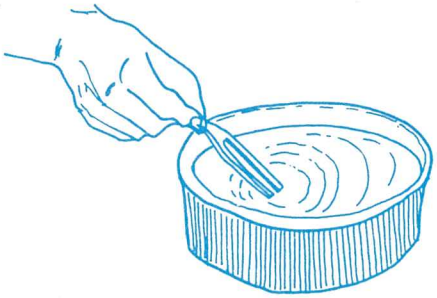


VIBRATIONS

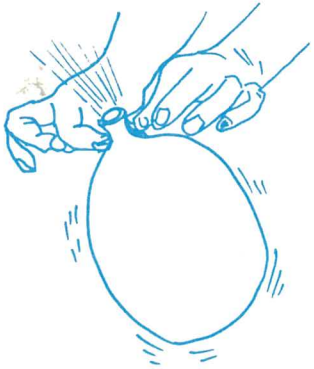
Here are a couple of simple activities to show that when a sound is made, something vibrates.

(1) Tape a ping-pong ball to a piece of string. Tap a tuning fork and hold it against the ball.
What do you notice?

(2) Tap a tuning fork and touch it on the surface of a bowl of water.
What do you notice?

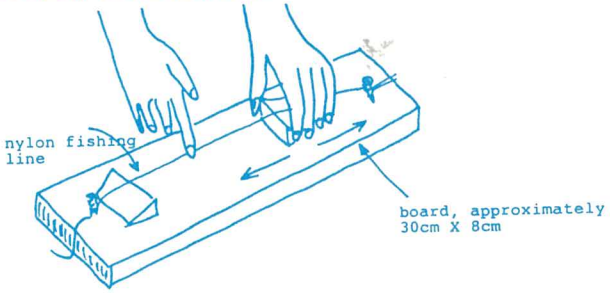


(3) Blow up a balloon. Pull the neck to make a slit. Let the air out of the balloon.
What do you notice?



DIFFERENT PITCH

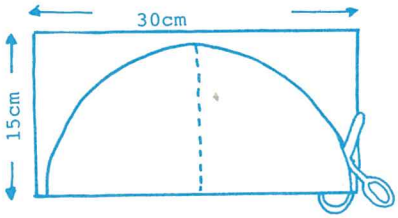
Make a sound board like the one in the diagram.
Obtain a piece of board approximately 40cm in length and 10cm in width. Fix a screw at each end and attach to each a length of fishing line or thin steel wire. Draw this as tight as possible.
Slide a wooden wedges under the wire at each end.
Now you are ready to make music!

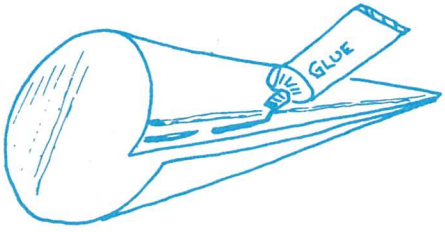


Pluck the wire with your finger.
Move one of the wedges so that the wire is shortened.
- How does the note change?
- Does the note get higher or lower?
- What happens to the note when the wire is tightened?
- Place a piece of folded paper at the mid-point of the string. What happens to the paper when the string is plucked?

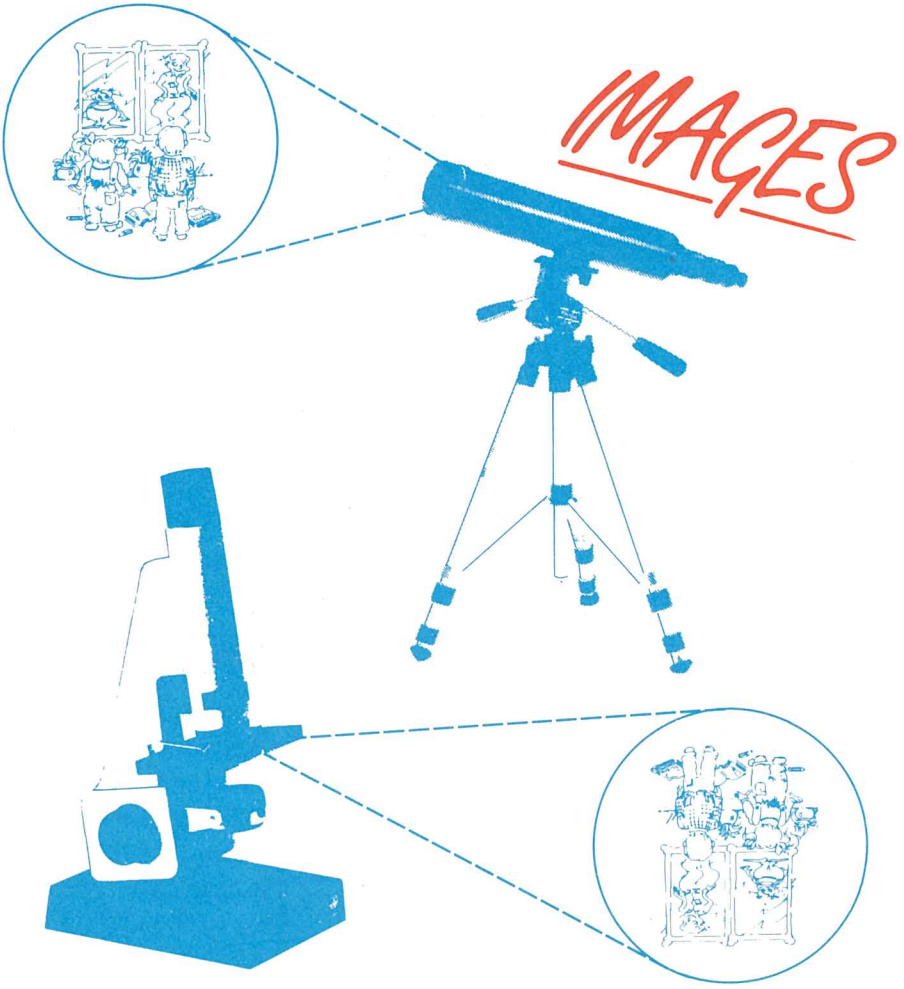
LOUDER SOUNDS

Use the pattern below to make a cone.
Put a sewing needle (or a long pin) through the pointed end of the cone.



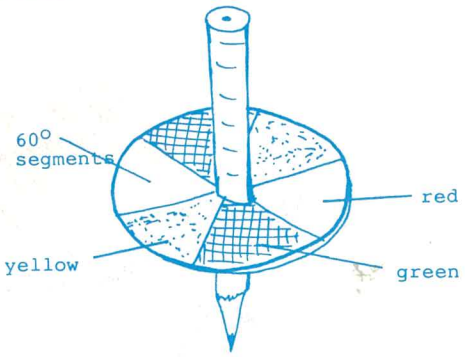


Start an OLD record rotating on a record player, and hold the needle in the grooves.
Can you hear the sounds on the record tracks?



Explain why the image is inverted through a microscope and not through a telescope.

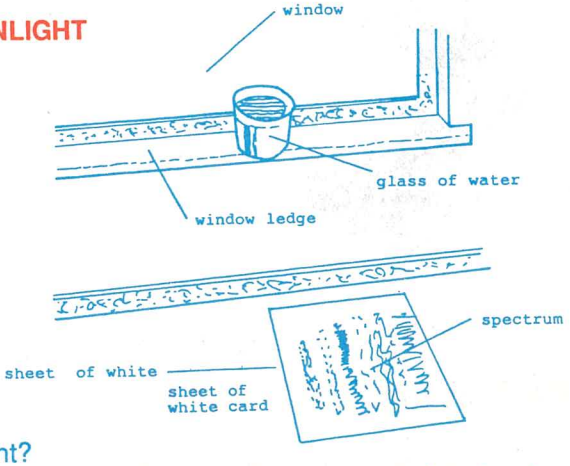
COLOUR WHEELS



Cut some circles from a sheet of card. Divide each circle into segments of equal size. Use various colours to shade each segment; for example, try alternating red, green and blue on a circle cut into three or six segments. Put a pencil or wooden meat skewer through the centre of the circle. Have the children spin the colour wheel about that axis and describe what they see.

Try this with seven segments and use the colours of the rainbow. This activity could be tried with any number of colours and segments. Children might investigate the effects of segments of different sizes.

COLOUR FROM SUNLIGHT



What colour is sunlight?
Stand a glass of water on a sunlit window ledge, just overhanging the inside edge. Put a sheet of white paper on the floor beneath the jar. What colours can be seen?
(If the weather is dull and overcast, a strong light above the glass will produce a similar effect)

BIGGER IMAGES

To make a water magnifying glass, cut off a short length of wire and twist it around the point of a pencil. This will give a loop about 5mm across. Dip the wire into water so that a drop of water is held in the loop. Hold the drop close to a piece of small print. By raising and lowering the drop, the image of the print will move in and out of focus.

Have the children try to answer the following questions :

-What makes up pictures in a newspaper?

-What do you notice about the size of the print when the drop is:

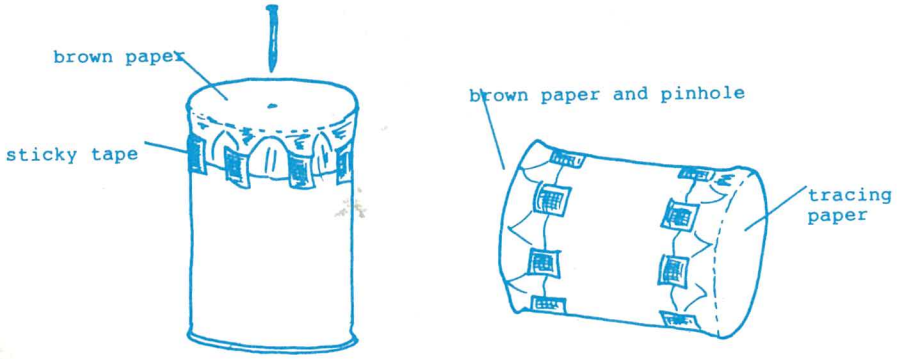
a) close to the page, and

b) away from the page?

-Does anything other than size change when the magnifier is moved?

MAKING A PINHOLE CAMERA

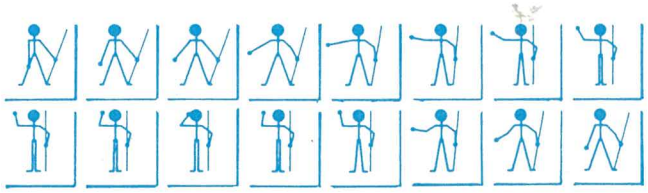
Obtain a jam tin with both ends removed. Be sure there are no sharp edges. Paint the inside of the tin with matt black paint. Cover one end of the tin with brown paper and make a small pinhole in the middle. Cover the other end with tracing paper.



Point the pinhole towards a light source and look for an image on the tracing paper 'screen'.

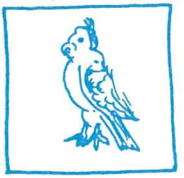
PIN MAN MOVIES

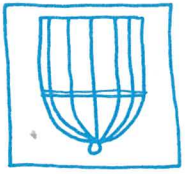
Trace some pin men like these onto the corner pages of an exercise book. Flick through them quickly and the pin man will appear to move. The children might investigate the effect of varying the number of pictures in a cycle. This could be related to cartoon animation on film.

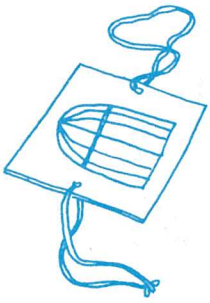


MAKE A WHAT.....A THAUMOTROPE!!!!!

The thaumatrope was a popular toy during the time of Queen Victoria, and it illustrates the principle of persistence of vision.
Make your own from the plans below and you can have lots of fun.



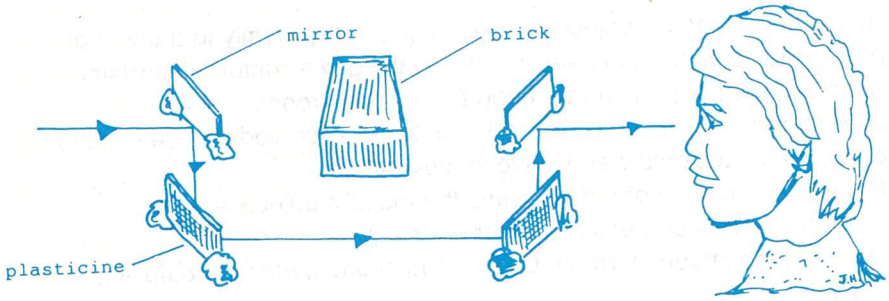




To spin the discs, short lengths of string are threaded through the pairs of holes. Each string is gripped between the finger and thumb of each hand and by rolling the strings, the disc can be rotated.
REMEMBER, the images you use must be upside down in relation to one another. (Ask the children to explain why.)

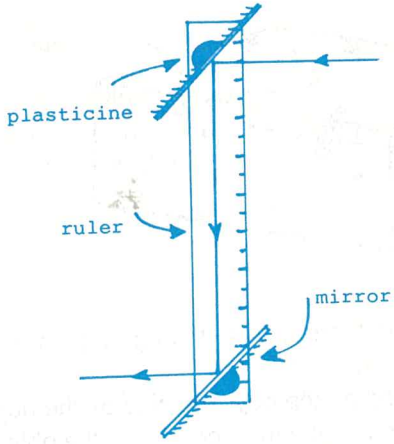
LOOKING THROUGH A BRICK

For this activity, you need four mirrors, some plasticine, a brick and considerable patience.
Set the children the task of arranging the four mirrors at such an angle that an image of a candle can be seen when the candle is behind the brick. The diagram included provides a few clues. The only rule is: you must use all four mirrors.



LOOKING AROUND CORNERS AND OVER FENCES

Why not have the children make a periscope?
They don't need a submarine to use one. All they need is a ruler, some plasticine and two mirrors.
Follow the diagram below, and good snooping!



AIR LENS

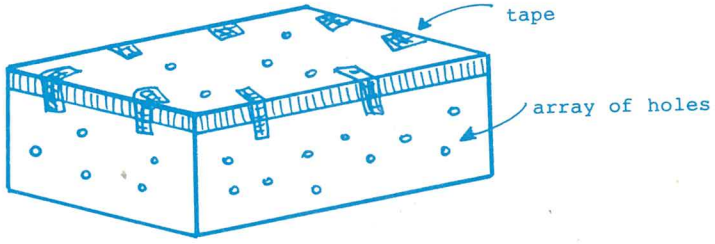
Tape two watch glasses together to make a water-tight seal. Hold the lens in place in an aquarium filled with water.
Look through the lens at objects placed in the tank with it. Have the children describe the image. Is it what they expect?

RADIO-ACTIVE IMAGES

Attach small metallic objects (key, coin, paper clip) firmly to a sheet of photographic paper and place the whole thing in a lightproof container (black plastic bag). Important - do this in a darkroom.
Place a radioactive source (only one of those approved for use in schools) on top of the assembly and leave for several days.
Remove the source of radiation and the metallic objects and photographically process the paper normally.
Describe the images formed. Do different sources produce different images?

INVESTIGATIONS BOX

Punch a regular array of small holes through opposite sides of a shoe box or other similar container.
Place an unknown object inside the box. Match the complexity of its shape to the age of the children. (Try a ball, cube, pyramid, bottle, car etc).



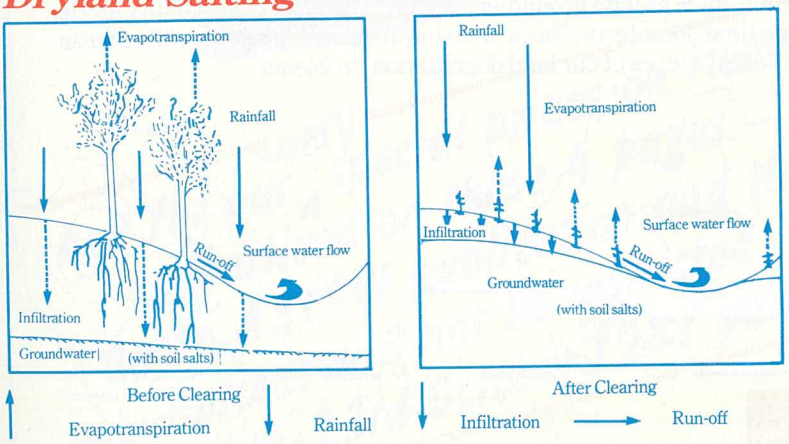
Have the children push knitting needles through the holes, stopping when they feel it touch something.
Interpret the image formed on the opposite side by the needles which show through. Can the children make inferences about the object inside?

What is Salinity?

Soil salinisation (salinity) is a major land degradation problem occurring in many parts of Australia. Salinity leads to a deterioration in surface water and groundwater quality, a lowering of land productivity, the death of sensitive native flora and wildlife habitat, and it predisposes precious soils to erosion. The current development of salinity in Australia, in both dryland and irrigation areas, can be related to changing hydrologic conditions; these conditions arise from the widespread clearing of vegetation and from changes in land use.

The salinity problem is related to *groundwater* behaviour. A small increase in infiltration of water from the surface–due to rainfall or irrigation–to the groundwater, can cause a significant rise in the level of the *watertable.* As they rise, the groundwaters dissolve naturally occurring salts in the soil and bring them towards the surface, where the salt is concentrated by evaporation. This increase in salt levels near the surface can damage vegetation and soils and so promote further change in the wider ecosystem.

Dryland Salting



Salinisation occurs extensively in all states of Australia, and particularly where, under native vegetation, rainfall was essentially balanced by evapotranspiration from vegetation. Relatively little groundwater accession occurred in these areas when in their natural state. Salinity is especially severe in the 500-900 mm annual rainfall areas of Western Australia and Victoria, but it occurs even in high rainfall areas.

Land degradation in the Murray-Darling Basin

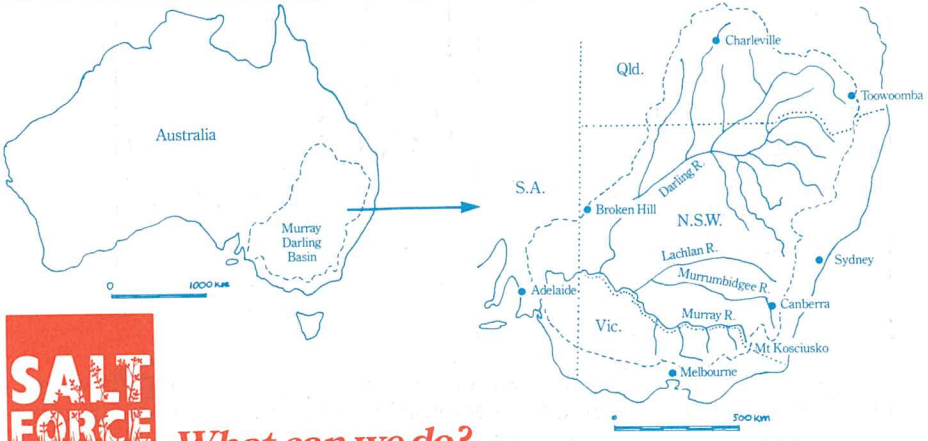
The Murray-Darling Basin, representing the watersheds of the Murray, Darling, Lachlan and Murrumbidgee Rivers and their tributaries, covers one million square kilometres, or one-seventh of Australia. The Basin is very important to Australia's economy, producing about 40% of our natural resource-based production, valued at over $10,000 million annually.

There is increasing concern about resource degradation in the Basin, with increasing land salinisation and soil erosion, rising groundwater levels, poor water quality in the rivers, and a loss of native flora and fauna species.

Although highly saline environments have been a feature of the area in times long past, the current problems of the Basin have arisen since European settlement, and are related to accelerated land-use change, (including extensive clearing of native vegetation and intensive irrigation) and the response of the land to these changes.

We should realise that our land-use practices, though now often recognised as inappropriate, were adopted in good faith by the first settlers; indeed, they have, to a large degree, been responsible for the standard of living which we now enjoy. We need now, as an entire community, to take co-operative action to protect our natural resources.

The Commonwealth and three State Governments (NSW, Victoria, SA) are co-operating in a new program to prevent further damage and to reduce the most serious impacts of resource degradation. The four Governments are presently developing a Resource Management Strategy for the Basin. This is likely to identify early initiatives which reduce the immediate and major symptoms of salinisation, such as high groundwater levels and peak river salinity levels. At the same time, long-term, Basin-wide improvement projects will address the fundamental causes of our land degradation problems.



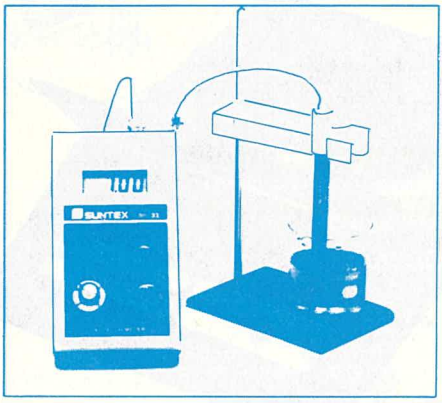
SALT FORCE

What can we do?

Community participation and understanding is essential to the success of Government initiatives against salting. No matter if we live in the country, or in a city, we are all responsible for keeping our land alive. A number of farmers and community groups in country areas have already begun to act, by planting trees, by being more careful about how they irrigate their land, or simply by making other people aware of the salinity problem. It is up to us all to give a hand.

To find out more about salinity, contact the appropriate Department in your state, or: Schools' Education Officer, Victorian Salinity Programme, Department of Conservation, Forests and Lands, 1/240 Victoria Parade, East Melbourne 3002 Ph. (03) 651 4369

STANSENS for Secondary Science



ALL TYPES OF pH METERS

Example of our Very Special ASISW prices

IEC–2060–001 Light Box Optical Set

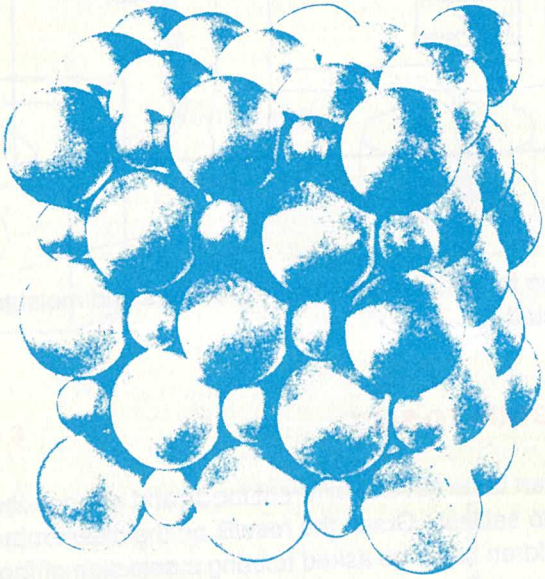
Regular Retail Price $82.20

Your price $64.00

POWER SUPPLIES – ALL TYPES

SALINITY

The biggest danger to our environment.



Recognize the environmental enemy!

STANSENS

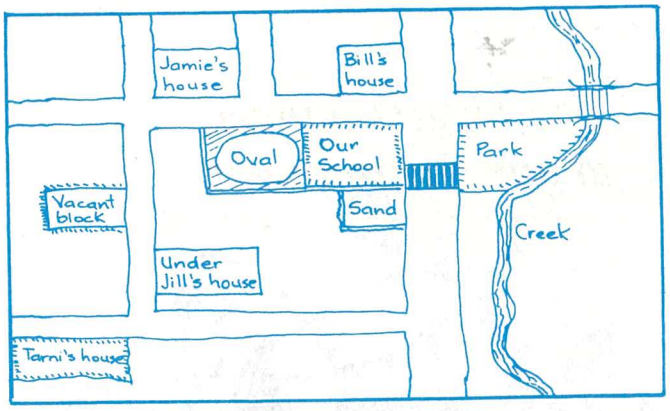
STANSENS

A Division of Phoenix Scientific Industries Limited.

Melbourne	427 0255
Sydney	750 7444
Brisbane	52 5141
Adelaide	363 1099
Perth	443 1788

AN INTRODUCTION TO SOIL

Collect and compare samples of soil within an area such as the schoolground or local park.
Make a map of the area and attach soil samples with glue.



Ask the children to compare the textures, colours and moisture levels of the soils collected.

AN INTRODUCTION TO SALT

Have the children taste several different foods and arrange them in order from sweetest to saltiest. Graph the results on the classroom wall. (For this activity, children could be asked to bring a selection of foods from home.)
Do all children decide on the same order?

SALT IN OUR FOODS

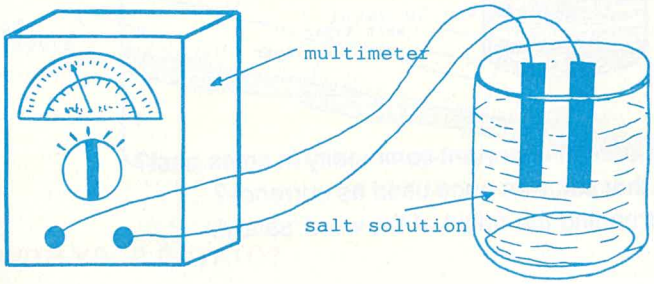
Survey the foods children have in the pantry at home. Is there salt in these foods?
Discuss the use of salts as a preservative.

HOW SALTY ? - 1

Provide several salt solutions of different concentrations. (Use a coding system so that the actual concentration is known only to the teacher.)
Ask the children to take a measured volume of one solution and carefully evaporate it to dryness. Repeat until each solution has been measured at least twice.
Arrange the solutions in order of concentration by comparing results.
Some students might calculate the concentration in appropriate units.

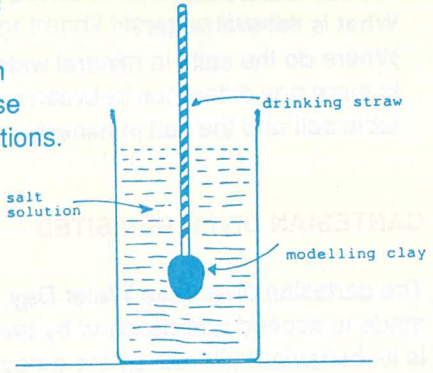
HOW SALTY? - 2

Build a simple conductivity meter as shown. Use it to measure the conductivity of salt solutions of different known concentrations.
Plot a calibration curve and use it to find the concentration of unknown solutions.



HOW SALTY? - 3

Make a simple hydrometer from a plastic drinking straw and modelling clay. Float it in salt solutions of known concentration and mark the water level on the stem. Use the hydrometer to test unknown salt solutions.

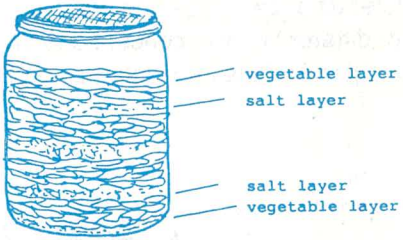


HOW SALTY? - 4

Use excess silver nitrate to precipitate silver chloride from a salt solution. Calculate the initial concentration from the mass of precipitate. Students might investigate the possible presence of other ions which could reduce the accuracy of this method.

SALTING FOODS

Try salting some vegetables in a jar as a method of preserving them.



Why was salt such an important commodity in times past?
Did you know that salt was once used as currency?
Have the children find the origin of the word 'salary'.

INTERESTING QUESTIONS

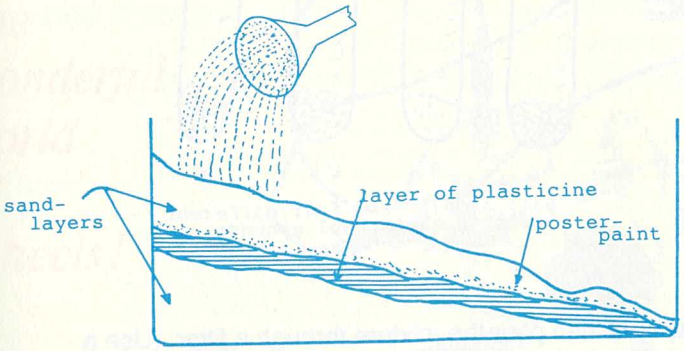
- Do we need salt in our food?
- Are our tears salty?
- What is mineral water?
- Where do the salts in mineral water come from?
- Is there any difference between sea salt, table salt and the salt in mineral water?

CARTESIAN DIVER REVISITED

The cartesian diver (see Water Day, 1986 Resource Book page 42) can be made to ascend and descend by transmitting a force through water.
Is its behaviour altered by the amount of salt dissolved in the water?

A RISING WATER TABLE

This activity can be used to illustrate how accessions are made to the water table and the subsequent upward movement of the water table towards the surface.
The equipment needed is: plastic bowl, sand or similar porous material, powder paint, plasticine and a watering can.
Using the watering can, apply the plain water to the soil 'surface', simulating rainfall (or irrigation). Observe what happens to the salt (powder paint) deep in the soil.



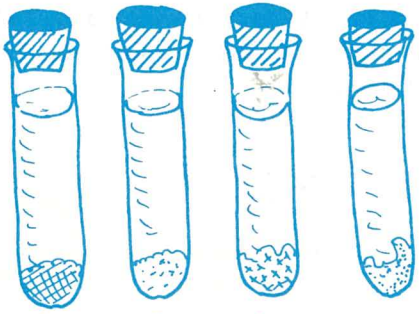
SALT WITH YOUR POTATO?

Make up a series of salt solutions of increasing concentration (5, 10 ,15 % by mass etc) and place them in beakers.
Cut similar cubes of raw potato with a side of 1 cm. Place one cube in each beaker. Observe carefully over a period of several hours. What changes occur? Is there a pattern or trend? How can this be explained?

SALTY SOILS

Have the children fill some test-tubes with a teaspoonful of soil from different areas of the school playground. To each sample add some distilled water. Shake the mixture vigorously.

Add distilled water to each sample.



Soil sample from four different areas of the school grounds.

The children should then pour the mixture through a filter. (Use a clean filter paper for each sample.) The solution collected in the beaker should be heated until the water is evaporated off.
If the soil contains sufficient salt, small crystals should be visible in the bottom of the beaker. These will be seen more clearly if the children use a hand lens or lightscope.

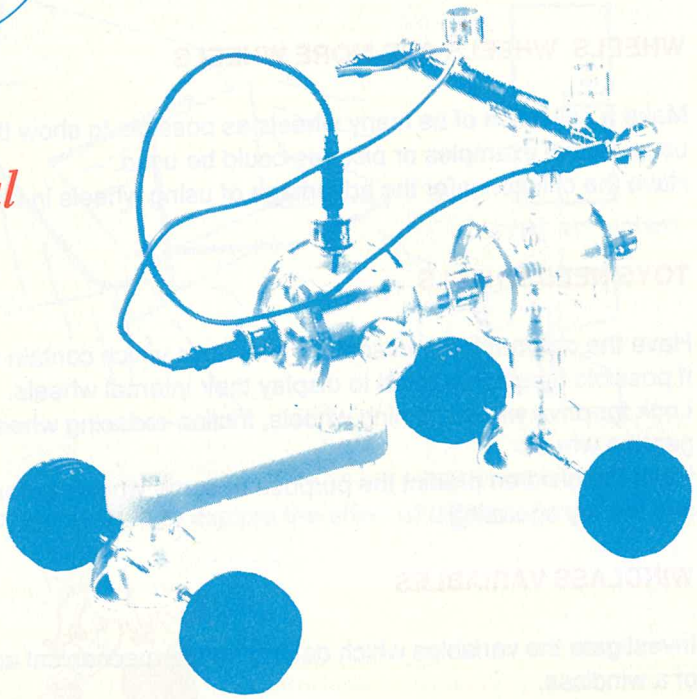
A TASTE OF SALT

Have students taste salty water of varying strengths. (**CAUTION** : This applies to common house salt only. Use supermarket packaged salt rather than reagent grade if children are involved in making up the solutions.)
The following solutions might be used:

A. tap water
B. distilled water + 0.15 g/L table salt = upper limit of fresh water
C. distilled water + 1.00 g/L table salt = upper limit of marginal water
D. distilled water + 30g/L table salt = upper limit of brackish water
E. distilled water + 350g/L table salt = simulated seawater

WHEELS

The Wonderful World of Wheels!



How many types of wheels can you think of and what are their uses?

MEASURING PI

Provide a range of different sized wheels which can be rolled along the ground.
Have the children measure the diameter of each, and then find its circumference by "trundling" it for a complete revolution.
Plot circumference against diameter. Draw a line of best fit and calculate its slope.

WHEELS, WHEELS AND MORE WHEELS

Make a collection of as many wheels as possible to show their many uses. Actual examples or pictures could be used.
Have the children infer the advantage of using wheels in each case.

TOYS NEED WHEELS

Have the children bring in some of their toys which contain wheels.
If possible take some apart to display their internal wheels.
Look for drive wheels, timing wheels, friction-reducing wheels, gearing wheels.
Have the children predict the purpose of some wheels before they see the toy operating

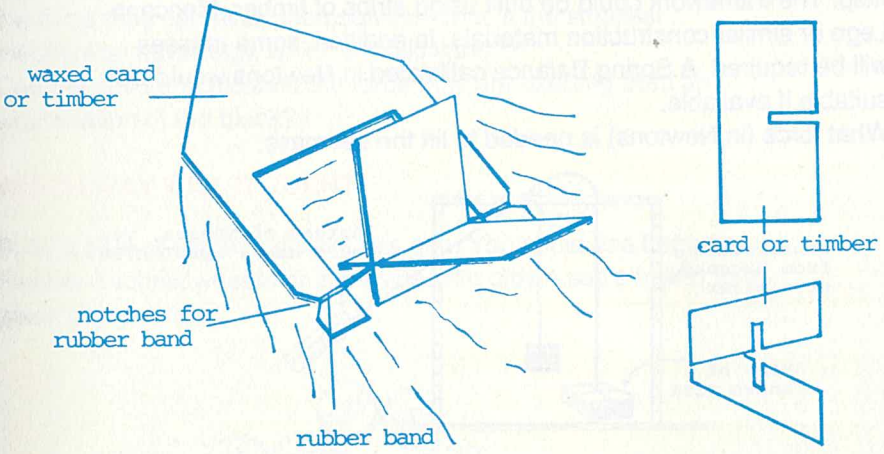
WINDLASS VARIABLES

Investigate the variables which determine the mechanical advantage of a windlass.
Children might modify a basic design to consider:
- diameter of the drum
- length of arm
- fixed or rotating handle

Ann Hayward,
Lego (Education) Australia,
Victoria.
Telephone: 03- 295348

WATER WHEELS

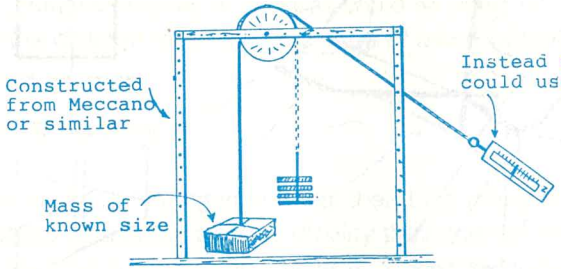
Using waterproof card, cut out Shape A and two pieces the same as Shape B. (Balsa wood can be used.) Assemble the paddle and fit it across the slot in A using a rubber band. Turn several times. place in water and release. Record the time the boat is in motion against the number of turns of the rubber band.

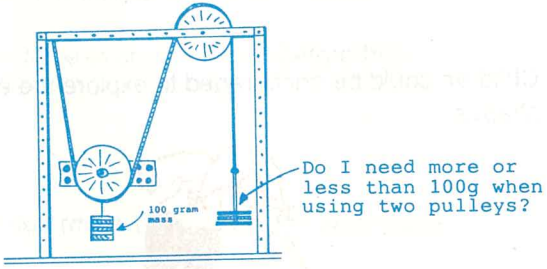


Children could be encouraged to explore the effect of different bow shapes.

MORE THAN ONE PULLEY

A one pulley system does have some advantages over no pulleys at all.....but it would be nice to make working really easy!
Children should be asked to investigate the effect of using more than one pulley on the effort needed to lift a load.
First, they will need to obtain a measure of the force needed to lift a set mass using a single pulley. The apparatus described below will help. The framework could be built using strips of timber, Meccano, Lego or similar construction materials. In addition, some masses will be required. A Spring Balance calibrated in Newtons would be suitable if available.
What force (in Newtons) is needed to lift the set mass.





To investigate the advantage of more than one pulley, it is necessary to construct a pulley system as indicated in the second diagram.
Is more or less force required to lift the set mass to the same height?
Have the children investigate the advantage of a three pulley system.

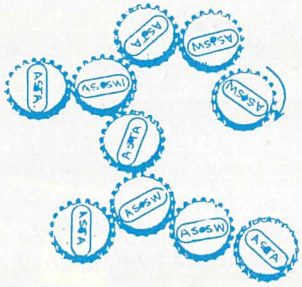
Con Clifford,
Lego (Education) Australia,
Queensland.
Telephone: 07-395 7816

CAN YOU LIFT YOURSELF OFF THE GROUND?

Construct a series of blocks and tackle holding a seat suspended from a major beam. Arrange them so that each has a different mechanical advantage.
(CAUTION- ensure that the beam, blocks and cordage used will support the weight of an adult BEFORE children see it.)
Have the children try to lift themselves off the ground using only the force they can exert themselves. What is the smallest mechanical advantage which will allow this?
Can the children calculate the force they are exerting from an examination of the block?

WHICH WAY WILL IT TURN?

Build a train of cog wheels like this one. You could use Lego or Fischer-Technik wheels or improvise with crown seals nailed to a piece of plywood.



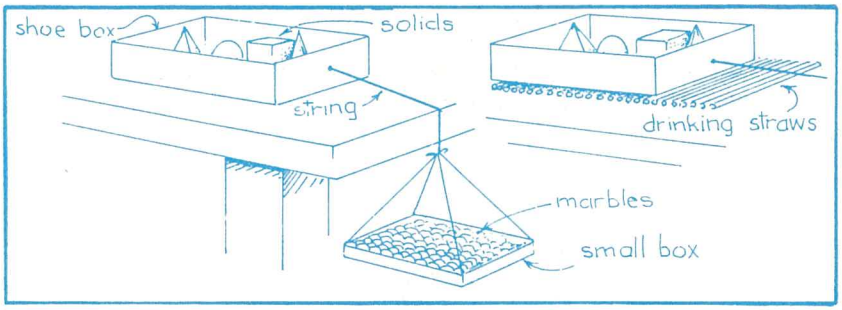
Challenge the children to predict the direction in which a particular cog will turn when you rotate another one.
Try belt drives (and crossed belts) to make the board more challenging.
Have the children devise their own challenges for each other.

Mary-Jane Leahy,
Lego (Education) Australia,
New South Wales.
Telephone: 02 - 328 1954

SLIDING AND ROLLING

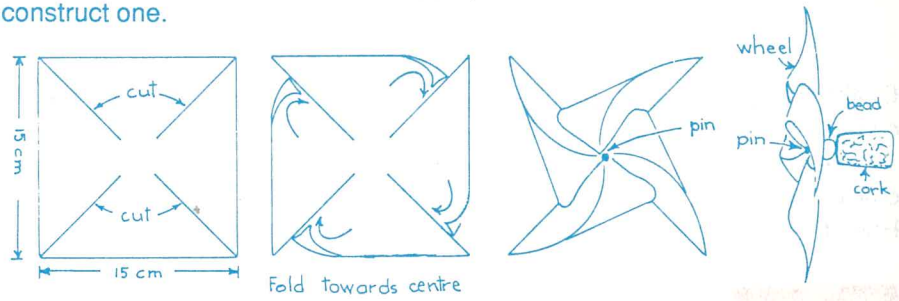
Have the children place a number of shapes in a shoebox and pull it along a table by a spring balance. (If a spring balance is not available, use a scale pan attached to a length of string; the pan is then filled with marbles until the shoebox moves.)
Record the spring balance reading, or the number of marbles needed.

Repeat this activity again, placing the shoebox on top of about twenty drinking straws or pencils. Is the spring balance reading the same as before? Or do you need the same number of marbles? (Instead of straws and pencils, you could place the shoebox on top of a cart made with Lego parts. Does this have a similar effect?)



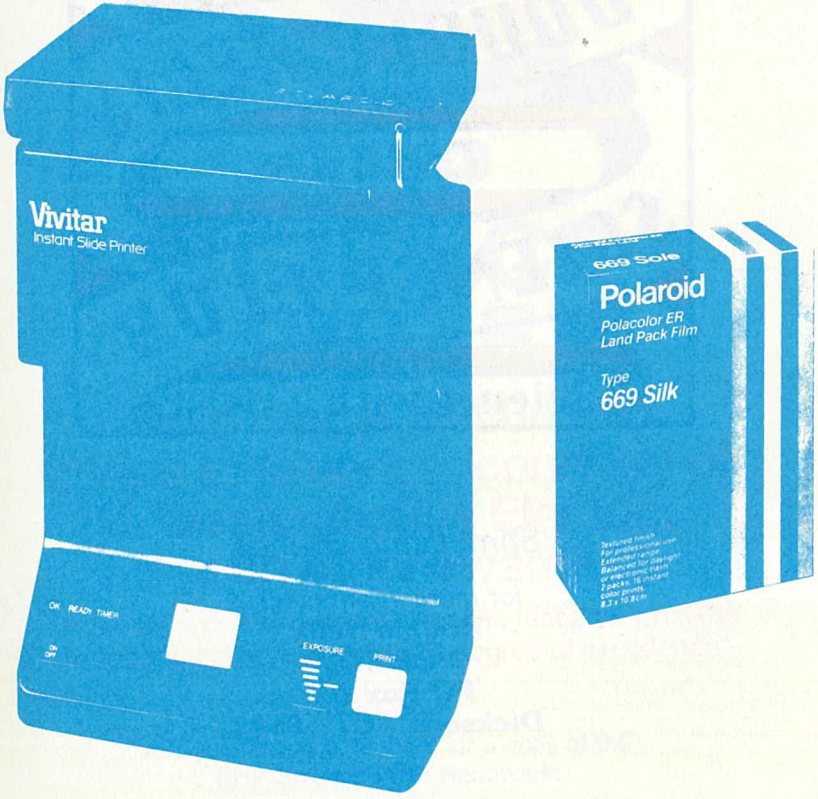
MAKING A PIN-WHEEL

A simple pin-wheel can be used to detect and measure the strength of moving air. With the help of this diagram, have the children construct one.



John Couper,
Lego (Education) Australia,
Tasmania.
Telephone: 003 - 341397

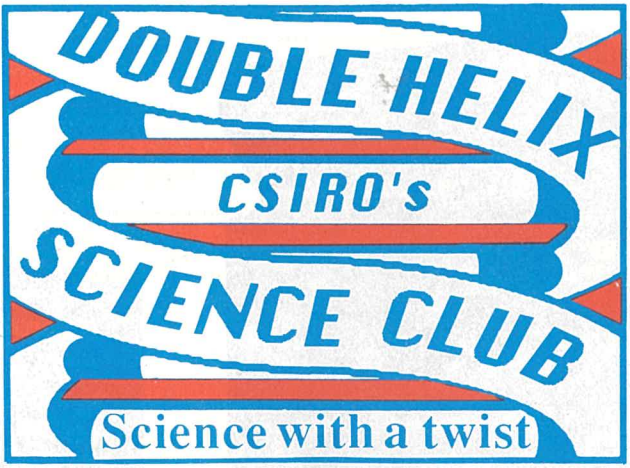
INTRODUCING THE VIVITAR INSTANT SLIDE PRINTER



Push a single button and get professional quality color prints from your slides in one minute. • Or black and white in 30 seconds. • Works off batteries, no power needed. • Convenience, lightweight, portable. • Inexpensive.

Polaroid

Polaroid Australia Pty. Ltd. Eden Park Estate, 31 Waterloo Road, North Ryde, NSW 2113. Phone: 887 2333 Telex: AA21508



Stimulating science

for more information:

Double Helix
CSIRO
PO Box 225
Dickson ACT 2602

BHP SCIENCE PRIZE

Gold medal, $5000 and 2 trips to America, courtesy of Ⓦ Westinghouse Electric, with other awards

Prizes awarded to original scientific research projects judged to achieve the highest degree of excellence.

To Enter:

Ask your Science Teacher for a copy of the BHP Science Prize Handbook.

Entry is through the Science Talent contest in your State or Territory.

Organised by

Australian Science Teachers Association

BHP

CSIRO

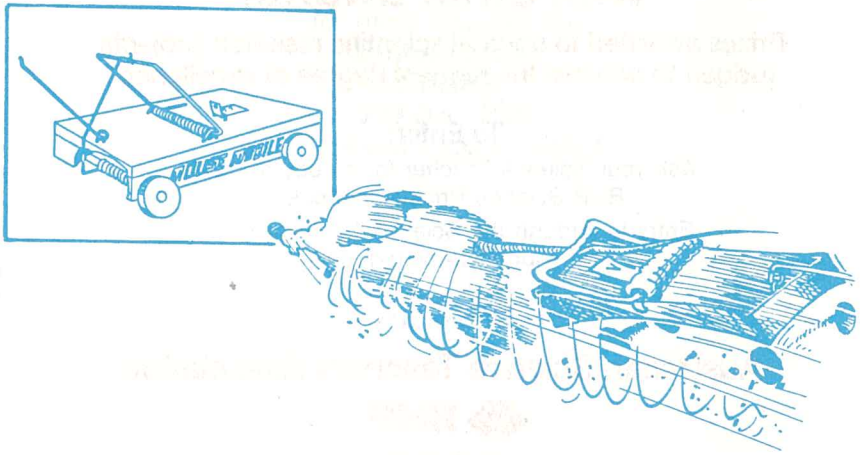
For further information: BHP Science Prize, PO Box 86A, Melbourne, Vic 3001

1987 MOUSE TRAP GRAND PRIX

Build a mobile mouse trap for your school or district competition. In 1986, this competition was first held in Tasmania. It created such interest that it was felt other states might wish to organise a similar event this year. The 1986 Tasmanian Grand Prix was sponsored by Radio station 7HT. Maybe you can convince a local station or newspaper to cover this event at your school. Even a local children's television program might be interested. The Tasmanian schools even combined to have State Finals, quite an undertaking. This was done in five sections:

Senior Secondary	(Grades 9-12)
Lower Secondary	(Grades 7-8)
Upper Primary	(Grades 5-6)
Lower Primary	(Grades 1-4)
The Most Innovative	(OPEN DIVISION)

CONDITIONS OF ENTRY:
(1) Competitors must have a complete mouse trap on, in or composing the vehicle. All mouse trap parts must be retained in their original position. (A rat trap is unacceptable.)
(2) All the driving force for the vehicle must come from the original mouse trap spring.
(3) Additions can be made to the mouse trap, provided conditions (1) and (2) are adhered to.
(4) The vehicle must have only one trap and its components within or on the structure.
ON COMPETITION DAY:
(5) The vehicles will run on Burnie-board, rough side up.
(6) The winner will be the owner/s of the vehicle which travels the furthest distance in a straight line.



THESE ASISW RESOURCES ARE AVAILABLE

IN LIMITED QUANTITIES DIRECT FROM BOB McALLISTER

(see order form below)

ASISW RESOURCE BOOK 1987

This is always a sought after publication and contains activities useful for the years ahead. This year's is the biggest to date, with more student activities. Limited extra numbers have been printed for those who'd like some extra copies for their schools. Only $1.50 post paid.

A.S.I.S.W. ACTIVITIES KITS (New for 1987)

ASISW 1987 IMAGES KIT
(over $35 value)

***** only $20 post paid *****

Your kit will contain items like:

* quality prism
* 2 mirrors
* optical fibre
* 2 glass lenses
* self illuminating hand -held microscope ($15 Value)
* bulb, holder, wires
* activities booklet

ASISW WHEELS KIT 1987
(over $20 value)

***** only $10.50 post paid *****

* a 50 piece LEGO activity pack
* mouse trap
* assorted LEGO wheels
* activities booklet

ORDER FORM

From:
.....
Address.....
.....
.....

Post to: Bob McAllister,
Curriculum Services,
Dept. of Education,
P.O. Box 33.
NORTH QUAY Q 4002
(07) 237 1030

Please rush me:

.....ASISW wheels kits at $10.50 post paid $.....

.....ASISW Images kits at $ 20.00 post paid $.....

.....copies of the ASISW 1987 resource book

(1-4 copies at $ 1.50 per copy post paid)

(5-9 copies at $1.30 per copy post paid)

(10+copies at $ 1.20 per copy post paid) $.....

TOTAL REMITTED $.....

Make cheques payable to Australian Science Teachers' Association

Contact Bob for a special price for large quantities

ASISW 1987 SUPPORT MATERIALS ORDER FORM

FROM: .....
ADDRESS: .....
.....
.....

Send to:
Please order through your State ASISW services co-ordinator
Remember to add postage/packing

ITEM	UNIT COST	QUANTITY	COST
ASISW Resource Book	1.50	.....	.....
T-Shirt ("Super Science" cartoon in four colours on quality white shirt) N. B. Check size (110 .....) (100 .....) (90 .....) (80 .....) (70 .....)	7.50	.....	.....
Badge (3 colours on whitebackground, metal)	0.70	.....	.....
Stickers - illustrated			
"ASISW 87"- sheet of 6 circular stickers- 5 illustated themes + ASISW motif	0.25	.....	.....
"Science has got class"	0.25	.....	.....
"Science is real magic"	0.25	.....	.....
"We Dig Science"	0.25	.....	.....
"Science is Far Out"	0.25	.....	.....
"Science is Full of Suprise"	0.25	.....	.....
"Lets investigate Science"	0.25	.....	.....
"Science is Experimenting"	0.25	.....	.....
"I Get a Bang out of Chemistry"	0.25	.....	.....
"Physics is Phantastic"	0.25	.....	.....
"Biology is a Real Buzz"	0.25	.....	.....
"Scintillating Science"	0.25	.....	.....
Stickers - One liners			
"Biology Grows on Me"	0.15	.....	.....
"Biology is for the Birds and Bees"	0.15	.....	.....
"Science is Fundamental"	0.15	.....	.....
"Astronomy is Out of This World"	0.15	.....	.....
"How is Your Experimental Technique?"	0.15	.....	.....
ASISW Certificates			
Certificate of Participation	0.05	.....	.....
Certificate of Merit	0.05	.....	.....
ASISW Balloon with printed "Super Science" motif	0.25	.....	.....
1986 High Tech Kit - includes hologram, liquid crystal & lots more	19.50	.....	.....

TOTAL .....

Add postage and packing .....

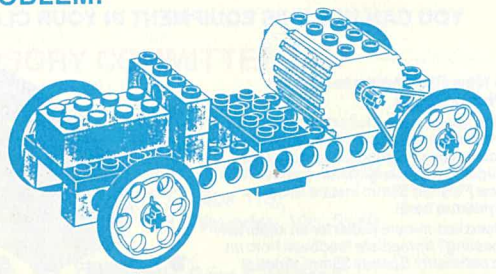
Total Payment Enclosed .....

Please order through your State ASISW services co-ordinator

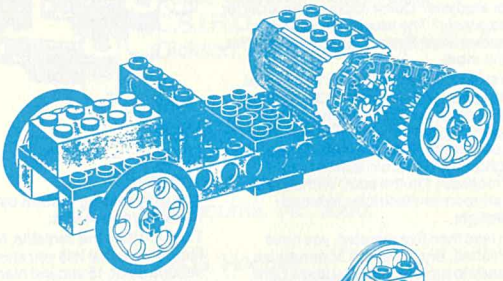
OFF TO A FLYING START!

WHEELS?.....NO PROBLEM!

And working together in every combination the children can imagine. Gears and pulleys too!

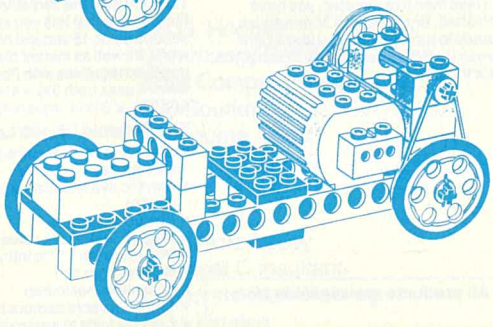


These models are from just one of the twenty inspiration cards that come with each LEGO Technic I and Technic II set.



. Which model will accelerate most rapidly?

. Which will end up going the fastest?



Technic

To find out more about LEGO Technic class packs and Teacher materials, contact your local LEGO Educational Consultant or:

LEGO Educational Materials Division,
P.O. Box 639,
Lane Cove. 2066.
N.S.W.
Telephone 02-428 9666

Polaroid

YOU CAN USE THIS EQUIPMENT IN YOUR CLASSROOM.

A New Dimension to 35mm Photography

Now you can have full color or black and white slides less than five minutes after you remove Polaroid's 35mm Instant Slide Film from any 35mm camera. The new Polaroid 35mm Instant Slide System is here!

Need last-minute slides for an important meeting? Immediate feedback from an experiment? Speedy 35mm slides of computer graphics for a management presentation? Fast quality control shots for analysis? Quick copies of an x-ray for diagnosis? The new Polaroid 35mm Instant Slide System gives you all of this, and more.

Use any 35mm camera or instrument equipped with a standard 35mm back. Take color, continuous-tone or high-contrast black and white slides. **Then process the film yourself** in the small, lightweight Polaroid 35mm Auto-Processor. On-the spot. Without a darkroom or electricity. In broad daylight.

In less then five minutes, you have finished, dry, mounted 35mm slides, ready to project. And you know right away that you have exactly the shot you want.

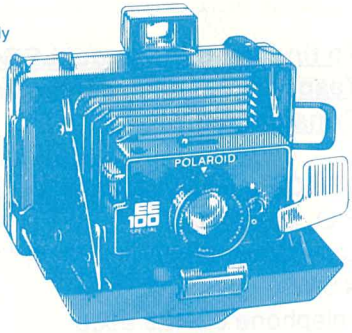
The EE-100.

The only folding instant camera that takes 8 types of film.

The EE-100 is the versatile, folding pack film camera that lets you shoot 60 second color, 15 second black and white, as well as instant black and white positive/negatives with Polaroid pack films. It uses both 3¼ x 4¼ in. pack films and $3^3/_8$ x 3¼ in. square format films.

The Polaroid EE-100 Land Camera

- Black and white pictures indoors without flash
- Electric eye for automatic exposure control
- Electronic shutter
- Precise 3-element coated plastic lens
- Pictures from 3.5' to infinity (flash pictures 4' to 12')
- Adjustable neckstrap
- Tough, durable camera body
- Camera folds to approximately 2 x 5 x 6"
- Projected frame viewfinder



All products are available from:

Photo Continental,
Kessels and Mains Road,
MACGREGOR.
Brisbane. Telephone 07-8494422

Foto Riesel (Sydney) Pty Ltd,
1st Floor,
411-413 Kent Street,
Sydney. 2000.
Telephone 02-296745

Marks Camera Store,
87-89 Queensbridge Street,
South Melbourne. 3205.
Telephone 03-614474

NATIONAL ADVISORY COMMITTEE 1987

Mr. R.M. Thomas,
Manager, Scientific Division,
A.E. Stansen & Co. Pty. Ltd.
P.O. Box 118,
Mt. Waverley, Vic. 3149.

Mr. J. Kehm
Scientific Division
A.E. Stansen & Co. Pty. Ltd.
P.O. Box 118,
Mt. Waverley, Vic. 3149.

Mr. J. Prentice,
C.S.I.R.O. Publications,
P.O. Box 89,
East Melbourne. Vic. 3002.

Mr. Ross Kingsland,
Public Communication Unit,
C.S.I.R.O.,
Dickson. ACT. 2602.

Mr. H.W. Davies,
Community Affairs Officer,
BHP Co Ltd.,
140 William St.
Melbourne. Vic. 3000.

Mrs. L. Hardy,
Public Affairs Officer,
BHP Co Ltd.,
140 William St.
Melbourne. Vic. 3000.

Miss S. Ewing,
Schools Education Officer,
(Salinity Program)
Dept. of Conservation, Forests,
and Lands
1/240 Victoria Pde
East Melbourne. Vic. 3002.

Ms G. Hogben
Community Relations Officer
Shell Company of Australia
550 Bourke St.,
Melbourne. 3000.

Dr. B. Chapman,
Competition Director, UNISCAN,
Education Testing Centre,
The University of Sydney.

Mr. I. Hore-Lacey,
Principal Consultant-
Corporate Staff Training
CRA Limited,
55 Collins St.,
Melbourne. 3000.

ASTA gratefully acknowledges the support of the Education Departments of Queensland, Western Australia, Tasmania and New Zealand.

ASISW NATIONAL EXECUTIVE COMMITTEE 1987

NATIONAL DIRECTORATE

Administration:
Keith Money,
Aspley State High School,
651 Zillmere Road,
ASPLEY. Q 4034.
(07) 263 3338 W

Publications:
John Hunt,
Curriculum Services,
Dept. Of Education,
P.O. Box 33
NORTH QUAY. Q 4002.
(07) 227 8984 W
237 0918

Services
Bob McAllister,
Curriculum Services,
Dept. Of Education,
P.O. Box 33
NORTH QUAY. Q 4002.
(07) 227 8782 W
237 1030

POSTER COMPETITION
Elizabeth Jacob,
Driver High School,
Tilston Avenue,
PALMESTON. NT 5787.
(089) 32 2299 W

PUBLICITY
Ross Kingsland,
Public Communication Unit,
C.S.I.R.O.,
P.O. Box 225,
DICKSON. ACT 2602.
(062) 48 4477 W

SERVICES LIAISON
Don Hyatt,
Huntingdale Technical School,
Bakers Road,
SOUTH OAKLEY. 3167.
(03) 579 2322 W

SPEAKERS SCHEME
Brenton Honeyman,
Wanniassa High School,
Wheeler Crescent,
WANNIASSA. ACT 2903.
(062) 31 0044 W

STATE CO-ORDINATORS 1987

Northern Territory
Kendall Stirrat,
Driver High School,
Tilston Avenue,
PALMESTON. NT 5787.
(089) 32 2299 W

A.C.T.
Liz Dangerfield
Erindale College,
McBride Crescent,
WANNIASSA. ACT 2903.
(062) 321 1178 W

N.S.W.
Di Englander,
Masada High School,
9 Link Road,
ST. IVES. NSW 2075.
(02) 449 3744 W

Western Australia
Colin Heinzman,
Cannington Senior High School,
301 Sevenoaks Street,
CANNINGTON. WA 6107.
(09) 447 4100 W

Tasmania
Darrel Harrington,
CSIRO Education Centre,
P.O. Box 256,
NORTH HOBART. TAS 7002.
(002) 30 7889 W

South Australia
Tom van Ruth,
Goodwood High School,
Lilly Street,
GOODWOOD. SA 5034.
(08) 272 4500 W

Queensland
Keith Money,
Aspley State High School,
Zillmere Road,
ASPLEY. Q 4034.
(07) 263 3338

Victoria
Lorraine Shannon,
Donburn Primary School,
Colchester Drive,
DONCASTER EAST. V. 3109.
(03) 842 5897 W