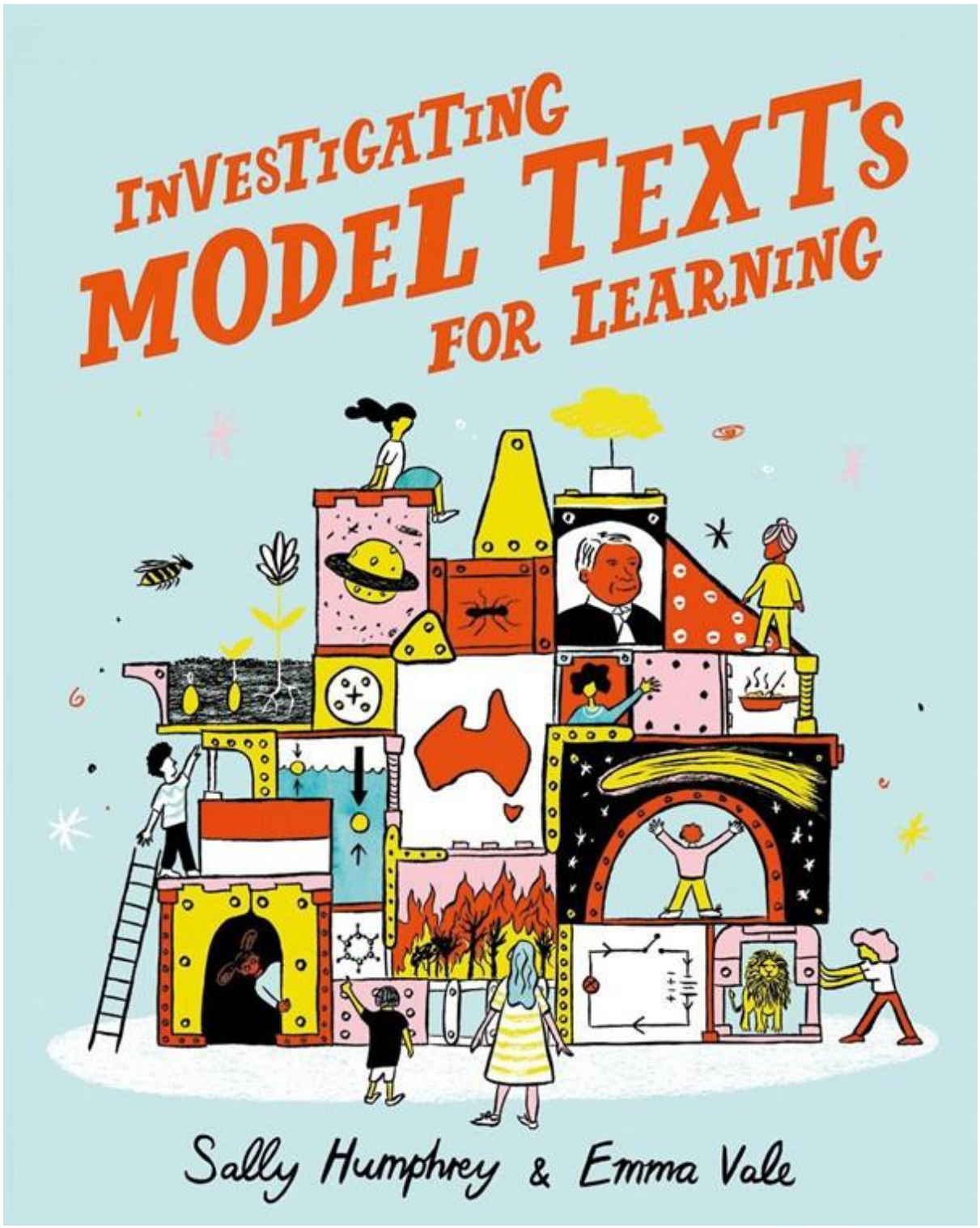
Supplementary Material: Science Model Texts



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Foundation: Descriptive report *Ants are living things*

Links to English Curriculum: AC9EFLA09, AC9EFLA05, AC9EFLA07, AC9EFLA08, AC9EFLA08
Links to Science Curriculum: AC9S1U01

Task Prompt: Write a description of one living thing that you learned about from our schoolyard study.

Ants are living things

Plants and animals are living things. Living things need air, food, water, and protection from the weather.

Some animals in our schoolyard are birds, children, beetles, and ants.

Ants get air from holes in their bodies.

They eat almost anything and they get water from the food they eat.

Ants live underground, or in trees for protection.

Year 2: Procedure *How to make recycled paper*

Links to English Curriculum: AC9E2LA06, AC9E2LA07, AC9E2LA09, AC9E2LY06
Links to Science Curriculum: AC9S2U03

Task prompt: Write instructions for recycling one everyday material.

How to make recycled paper

Why should you make paper?

Making your own paper is a good way of re-using materials to save the earth's resources and energy.

Materials

- Any type of paper that isn't waxed:
- construction paper
- printer paper
- magazines
- toilet paper
- paper towels
- old birthday cards
- paper serviettes

Steps

1. Tear the paper into small bits and put into a blender.
2. Fill the blender about 2/3 full with warm water.
3. Blend the pulp until it is smooth.
4. Add 2 teaspoons liquid starch and food colouring if needed.
5. Place the mould in a shallow tray and pour in the blended mixture.
6. Sprinkle some decorative materials on top.
7. Shake the mould from side to side to level the mixture out.
8. Place on newspapers to dry.

Year 2: Investigation (Experimental record) *Sinking and Floating*

Links to Science Curriculum: describe pushes and pulls in terms of strength and direction and predict the effect of these forces on objects' motion and shape (AC9S1U03), suggest and follow safe procedures to investigate questions and test predictions (AC9S1I02), compare observations with predictions and others' observations, consider if investigations are fair and identify further questions with guidance (AC9S1I05)

Links to English Curriculum: AC9E2LA03, AC9E2LA06, AC9E2LY06

Task Prompt: What makes some objects sink and some objects float?

Sinking and Floating

Aim

To investigate which objects sink or float in water

Materials

- 1 tub of water
- Different waterproof objects, some light, and some heavy, some wide and some narrow

Procedure

1. *Place* each object in the water, one at a time.

2. *Observe* the object to see if it sinks or floats.

3. *Record* results.

Observation

Some objects (the balloon and the fly swat) floated right on top of the water. Some objects (the wooden block and the rock) sank to the bottom. Some (the pencil) only sank a little bit.

Explanation

The force of the water pushes up on the object, and the force of the object pushes down on the water. If the force of the water is stronger than the force of the object, the object floats. If the force of the object is stronger than the force of the water, the object sinks. I can push a floating object down to the bottom, but if I let go, the force of the water pushes it back up again.

Year 2: Exposition (hortatory) *Why water shouldn't be wasted*

Links to English Curriculum: AC9E2LA03, AC9E2LA06, AC9E2LA09, AC9E2LY06
Links to Science Curriculum: compare the observable properties of soils, rocks and minerals and investigate why they are important Earth resources (AC9S3U02); describe how people use science in their daily lives, including using patterns to make scientific predictions (AC9S1H01)

Task Prompt: Let's persuade the students in our school that they shouldn't waste water.

Why water shouldn't be wasted

Water is a resource we need for drinking, cooking, washing and growing things. Water should not be wasted for several reasons.

Firstly, people often use more water than they need, such as leaving the sprinkler on the lawn all day. If everybody uses too much water, the storage dams may run out.

Another argument is that water costs money.If you use too much water, you have to pay a lot, and there is not enough left over to buy other important things.

Finally, people in dry areas may feel that the city people do not care about them if they waste water.

Therefore, it is important that we think about the water we use and not waste it.Then there will be enough water for everyone.

Year 3: Explanation *How water turns into ice*

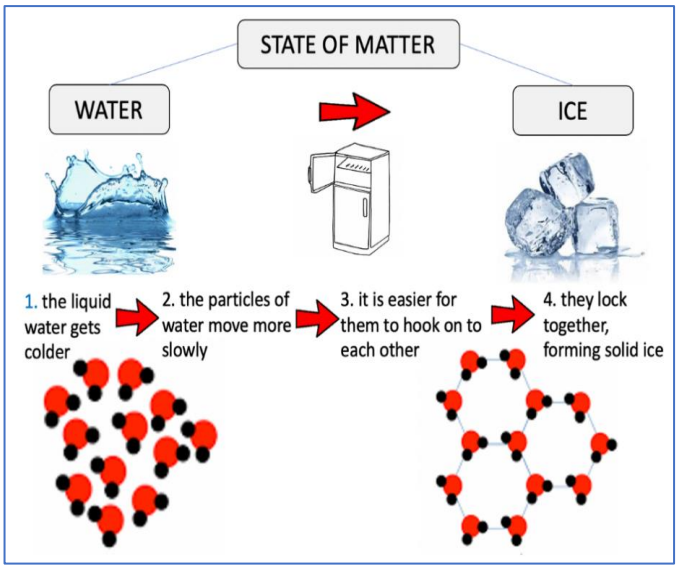
Links to English Curriculum: AC9E3LA03, AC9E3LA07, AC9E3LA08, AC9E3LA10, AC9E3LY06
Links to Science Curriculum: AC9S3U04

Task Prompt: Explain how water turns into ice.

How water turns into ice

When water gets to zero degrees celsius, it freezes into ice.

As the water gets colder, the particles of water move more slowly. When the particles move more slowly, it is easier for them to hook on to each other. When enough of the particles hook on to each other, they lock together, and that is ice.



Year 4: Factual recount *IMAS fun day!*

Links to English Curriculum: AC9E4LA03, AC9E4LA06, ACELT1607
Links to Science Curriculum: AC9S4I06

Task Prompt: Write a recount of the class excursion to IMAS. Make sure you include factual details of what we saw at IMAS and what we learned.

IMAS fun day!

This morning we went to the Institute for Marine and Antarctic Studies (IMAS). We walked through Kelvedon Park. It was a beautiful morning.

First we went to a slideshow about Dogfish (a shark). They talked about how to track sharks because GPS doesn't work under water. They just use little beeping tags and microphones placed around the area to track them.

Next we looked at scuba gear and underwater cameras. There was a remote-controlled vehicle that can take photos. They had a screen showing footage (not live) from an underwater camera. The scuba gear had two mouth pieces because if one person runs out of air while scuba diving, they can use the other person's.

Lastly, we looked at the lobsters. First the guide showed us a baby western rock lobster. Everyone got to touch it. The tail was really soft, but the body was quite spiky. Then he showed us another. It was a bit bigger, probably an adult. It was another western rock lobster. Then he showed us a third one called the Tasmanian Giant Freshwater Lobster. It was massive. Apparently it was the biggest species of lobster in the world.

I really enjoyed the visit to IMAS. My favourite thing was the massive lobster.

Year 4: Explanation *Life cycle of a plant*

Links to English Curriculum: AC9E4LA02, AC9E4LA04, AC9E4LA06, AC9E4LA11, AC9E4LY03, AC9E4LY06
Links to Science Curriculum: ACSSU072

Task Prompt: Explain how a plant grows.

Life cycle of a plant

All plants grow, change and reproduce. These changes are called a life cycle.
Most plants begin life as a seed, which needs light, water and warmth (in order) to germinate.
After germination, the seed turns into a sprout. It forms a root that will search for food and water in the soil (in order) to help the plant grow.

When the sprout has grown leaves, it is a seedling and can make its own food. (So) It uses light, water and carbon dioxide from the air, and nutrients in the soil, (in order) to become a mature plant with leaves and a root system.

Year 4: Hortatory exposition *Why we need bees*

Links to English Curriculum: AC9E4LA02, AC9E4LA03, AC9E4LA06, AC9E4LY06
Links to Science Curriculum: AC9S4U01, AC9S4U01

Task Prompt: Let's write an article for the school newsletter to persuade our community to look after bees.

Why we need bees

Bees are one of the most important insects in the environment, yet they are in dangerous decline. Humans have to help.

Bees are important for the life cycle of plants. They carry pollen between plants to fertilise them. Without bees, many plants would not reproduce and humans would not have food to eat.

Bees are in decline for a number of reasons. Some have a fatal virus. Many ingest insecticides on crops and die. Sometimes they run out of water and food because of drought and bushfires.

Humans can help bees. We can plant flowering plants in our gardens. We can make sure that they have water when the weather is hot. We can build insect hotels for native bees in a place safe from predators, and we can stop using insecticides in our gardens when bees are around.

Bees need humans to help them survive and humans need bees to help us survive.

Year 6: Descriptive report (compositional) *The solar system*

Links to English Curriculum: AC9E6LA03, AC9E6LA04, AC9E6LA06, AC9E6LY03, AC9E6LY06

Links to Science Curriculum: AC9S6U02

Task prompt: Describe the parts of the solar system and their features.

The Solar System

Space is the name for anything outside of the Earth's atmosphere. It includes galaxies, stars, planets and moons. The earth's galaxy is the Milky Way and within the Milky Way is our solar system. It consists of a star, the Sun, and everything bound to it by gravity – the planets, moons, and millions of asteroids, comets and meteoroids.

The sun provides all energy to the solar system in the form of heat and light. There are eight planets in the solar system. They are, in order from the Sun, Mercury, Venus, Earth, Mars, Jupiter, Saturn and Neptune. Nearest the sun, only rocky material could survive, so the first four planets (Mercury, Venus, Earth and Mars) are terrestrial planets. The planets in the outer regions consist of gas (Jupiter and Saturn) or ice (Uranus and Neptune).

Year 6: Explanation *How a torch works*

Links to English Curriculum: AC9E6LA04, AC9E6LA09, AC9E6LA05, AC9E6LY03, AC9E6LY06

Links to Science Curriculum: AC9S6U03

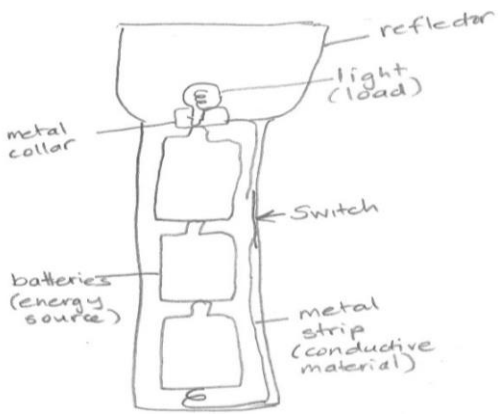
Task prompt: Explain how a torch works.

How a torch works

A torch is an example of a simple electric circuit. It consists of a battery (energy source), a metal strip that runs inside the torch to the metal collar of the reflector at the top of the torch (conductive material), a bulb (load) and a switch.

When the switch is pushed on, the metal strip makes contact with the metal collar at the base of the reflector, (thus) making a continuous path for electricity to flow. This flow of electricity is known as the electric current. (Then) The electric current is directed from the positive terminal of the battery towards the negative terminal.

As the current flows through the bulb, electrical energy is transformed into light energy, causing the filament to glow. (Then) The current will keep flowing until the switch is turned off, or the energy source, the battery, is depleted.



Year 6: Procedural recount (investigation) *Cooking with solar energy*

Links to English Curriculum: AC9E6LA03, AC9E6LA07, AC9E6LA08, AC9E6LY03, AC9E6LY06

Links to Science Curriculum: AC9S6U03, AC9S6H01, AC9S6I01, AC9S6I02, AC9S6I05, AC9S6I05

Task prompt: Investigate one way that people can use solar or wind energy effectively and efficiently to help them in their daily life.

Cooking with solar energy (see next page for pdf)

Aim

To investigate whether energy from the sun can be used to cook food.

Hypothesis

The oven's temperature will rise over 65^{o}.

Materials

1. large cardboard box with lid
2. sheets construction paper, black …

Procedure

3. Stretch the plastic to cover the entire underside of the lid.

…

8. Place an oven thermometer in the bottom of the small box. Put the lid back on the large box, fold the reflector flap back.

Explanation

The heat energy from the sun heats up the oven in three ways. Firstly, the black surface of the box absorbs heat energy.

Secondly the insulation between the two boxes minimises heat transfer so that the heat is retained inside the box Thirdly, the large reflector captures additional light energy which is reflected into the box and converted to heat energy.

Discussion

This oven was the most efficient oven of the eight ovens tested. Further testing could investigate the effect of changing any of three variables.

Science Investigation:
Cooking with Solar Energy

adapted from Yr 8 exemplar, Australian Curriculum Science and http://www.ehow.com/how_6754434_make-cardboard-box-solar-oven.html.

Aim:

To investigate whether energy from the sun can be used directly to cook food.

Hypothesis

The solar oven's temperature will rise over 65º.

Materials:

- ☐ 1 large cardboard box with lid
- ☐ 1 small cardboard box, no lid
- ☐ Ruler
- ☐ Marker, black
- ☐ Box cutter
- ☐ Clear plastic
- ☐ Duct tape
- ☐ Aluminum foil
- ☐ Glue
- ☐ 2 sheets construction paper, black
- ☐ Thermometer
- ☐ Insulation (packing noodles,Styrofoam, sawdust or screwed up paper)

Procedure

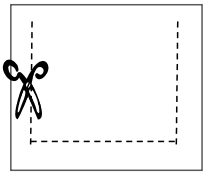


Figure 1

1. Cut three lines on the lid of the large box with a box cutter 5cm in from edge (Figure 1). This forms the reflective flap that folds back.
2. Flip the lid over to expose the underside. Cut a piece of plastic 2-4cm larger than the hole.
3. Stretch the plastic to cover the entire underside of the lid. Tape the sides of the plastic so that no air is able to escape from any of its edges.
4. Turn the lid over and pull back the reflective flap. Spread glue in a thin layer over the entire surface of the cardboard flap. Cover it with aluminium foil from edge to edge, keeping it as smooth as possible.
5. Place the smaller box inside the larger one. Spread a layer of thin glue along the bottom of the inside of the small box. Cover the entire bottom with black paper, making sure it's smooth.
6. Glue aluminium foil to the other four sides of the smaller box.
7. Pack the cavity between the walls with insulation.

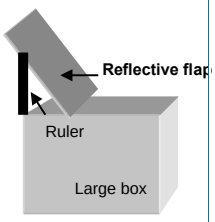


Figure 2

8. Place an oven thermometer in the bottom of the small box. Put the lid back on the large box, fold the reflector flap back. Hold it in place by taping a stick or ruler to the reflector with tape. (Figure 2)
9. Place the solar oven in the sun with the reflector facing the sun.
10. Measure and record the starting temperature. Check oven temperature every 10 minutes and record.

Results

Time	*Temperature (ºC)*	*Temperature Change (ºC)*
10:00am	38 ºC	0 ºC
10:10am	71 ºC	+33 ºC
10:20am	82 ºC	+11 ºC
10:30am	90 ºC	+8 ºC
10:40am	91 ºC	+1 ºC

Explanation

The heat energy from the sun heats up the oven in three ways; firstly the black surface of the box absorbs heat energy. Secondly the insulation between the two boxes minimises heat transfer so that the heat is retained inside the box where it is needed to cook food. Thirdly, the large reflector captures additional light energy which is reflected into the box and converted to heat energy.

Discussion

This oven was the most efficient oven of the eight ovens tested. Further testing could investigate the effect of changing any of three variables: increase the black surface area of the box, use a larger outer box so that the quantity of insulation between the two boxes is increased, or increase the surface area of the reflector to reflect more sunlight.