Level

F	1	2	3	4	5	6	B6

Energy around us

Strand
Energy and Change

Key concepts
In interactions and changes, energy is transferred and transformed but is not created or destroyed.

There are different ways of obtaining and utilising energy and these have different consequences.

Purpose

Activities in this module are designed to help students explore the concept of energy and how it is used in everyday life. Students have opportunities to:

- make observations to raise their awareness of where energy is used;
- examine different energy forms;
- identify, and collect information about, different forms of energy used in everyday life;
- make links between forms of energy and their immediate source(s);
- discuss their thinking about various forms of energy.

Overview of activities

The following table shows the activities in this module and the way in which these are organised in **introductory**, **developmental** and **culminating** phases.

Introductory ►	Developmental ►	Culminating
What is energy?	Energy use in the classroom	The world around us
Introduction to energy	Energy use in the school	Camping
	Energy use at home	
	The sun as a source of heat energy	
	The sun as a source of light energy	
	Making stringed musical instruments	
	Home-made drums	
	Straw football	
	Electricity	

QUEENSLAND SCHOOL CURRICULUM COUNCIL

Core learning outcomes

This module focuses on the following core learning outcomes from the Years 1 to 10 Science Syllabus:

Energy and Change

1.2 Students identify the effects of energy in their daily lives.

1.3 Students make links between the way they use energy and the immediate source of that energy.

2.2 Students identify and describe forms of energy in their community (including heat and energy of movement).

2.3 Students illustrate the ways that energy is used in their community.

Activities in this module also provide opportunities for students to demonstrate a level of understanding before Level 1.

Core content

This module incorporates the following core content from the syllabus:

Energy and Change

Energy types
- heat, sound, light, electrical

Energy transfers that occur in:
- home, community

Sources of energy
- sun (wind energy)

Energy use
- social patterns of energy use

Assessment strategy

Suggestions for gathering information about student learning are provided in each of the activities in this module. Once sufficient information has been collected, judgments can be made about students' demonstrations of outcomes. Typical demonstrations of this module's intended outcomes are provided here to indicate the pattern of behaviour to look for when making judgments.

Energy and Change

Foundation Level
Students are developing an understanding of the ways that things move and behave and can communicate some of these ideas.

Students may:
- identify the presence of energy in their play;
- identify the presence of energy in everyday situations.

Energy and Change

1.2 Students identify the effects of energy in their daily lives.

Students may:
- identify and describe different forms of energy used at a particular point in time — for example, light;
- identify where energy is used in the classroom, school and home;
- describe the effects that different forms of energy have on people and objects.

Energy and Change

1.3 Students make links between the way they use energy and the immediate source of that energy.

Students may:

- recognise that the same form of energy can come from different sources;
- make links between the form of energy and the uses made of it.

Energy and Change

2.2 Students identify and describe forms of energy in their community (including heat and energy of movement).

Students may:

- list different forms of energy — heat, sound, light, electrical and wind energy and energy of movement;
- describe some characteristics of different forms of energy.

Energy and Change

2.3 Students illustrate the ways that energy is used in their community.

Students may:

- describe and list different ways the community uses various forms of energy — for example, electrical energy, heat energy and light energy;
- describe alternative ways of obtaining different forms of energy.

Background information

Current scientific conceptions

The word 'energy' is used differently in different contexts and has, through everyday usage, come to have a variety of meanings. Scientists use the word in various contexts depending on the discipline in which they work. Whatever the scientist's field, energy usually refers to the ability to do work.

Forms of energy that will be familiar to students include heat, light, sound and electrical energy and energy of movement (kinetic energy). Various forms of energy can be transformed into other forms of energy. For example, many household appliances transform electrical energy. A lamp transforms electrical energy into light and heat; a clothes drier transforms electrical energy into heat and kinetic energy, as well as sound.

A primary source of energy on Earth is the sun. Food, moving water and air are also sources of energy.

Students' prior understandings

Students' prior understandings may differ from current scientific conceptions in a range of ways.

Some students may:

- not distinguish between forms and sources of energy;
- have heard about energy only in relation to foods such as bread, breakfast cereals and sports drinks;
- believe that energy is associated only with living things or moving things — for example, 'I don't have much energy today';
- never have heard or considered the term 'energy' in any context.

It is possible to experience the effects of energy. For example, we cannot see the wind, but we can see trees sway and hear leaves rustle. Similarly, we cannot see the soundwaves coming from a stereo system, but we can hear the music being played. Since students at this level rely heavily on concrete examples and are not able to work in the abstract, the focus of classroom activities needs to be on experiencing, evaluating and discussing the effects of energy rather than on learning the principles by which energy operates.

Teachers can also support students by using language appropriately. For example, although energy can be changed into many forms it is never actually lost, just changed into a different form. Energy cannot be 'saved' in the true sense of the term. It just changes into another form that may be more or less useful.

Terminology

Terms associated with energy are essential to the activities in this module — for example:

changes	heat	sound
electricity	light	source
form	resource	

Students may already be familiar with some of these terms and understand their meanings and use in scientific contexts. If so, the activities in this module will provide opportunities for them to evaluate current usage. If not, these activities will provide opportunities for students to develop their understandings.

School authority policies

Teachers need to be aware of and observe school authority policies that may be relevant to this module.

Safety policies are of particular relevance to the activities that follow. It is essential that demonstrations and student activities are conducted according to procedures developed through appropriate risk assessments at the school.

In this module, teachers need to consider safety issues relating to:

- students' proximity to heat sources, including lights, fires and lamps;
- students' access to the 240-volt power supply within electrical equipment in the classroom and wider school environment;
- exposure to the sun during activities conducted outdoors.

Support materials and references

Richmond, J. & Swindell, R. 1994, *Energy in Society and 101 Ways of Saving It*, Griffith University, Brisbane.

Skamp, K. (ed.) 1998, *Teaching Primary Science Constructively*, Harcourt Brace, Marrickville, NSW.

ACTIVITY

What is energy?

Introductory

Focus

This activity provides opportunities for students to reflect on and share ideas about the term 'energy'.

Materials

For groups or the whole class depending on classroom organisation:

- balls
- skipping ropes

For the teacher:

- stopwatch or egg timer

Teaching considerations

Several suggestions are provided for physical activities that students can perform. Any other activities that students are physically capable of doing for one minute would also be suitable. Students can do the activities as a class or in small groups on a rotational basis, depending on equipment available.

Numeracy skills

This activity supports students' development of numeracy skills by helping them to gain an understanding of the mathematical concept of one-minute time intervals.

Safety

Inform students about:

- safe practices for using skipping ropes;
- ways of protecting themselves from the sun during outdoor activities.

Working scientifically

Time: 30 minutes

Discussing thinking

▶ Students do five different activities, spending one minute on each. The teacher times the one-minute intervals and directs students to change activities as necessary. Activities could include skipping, bouncing a ball, catching a ball bounced off the wall, star jumps and bent-knee sit-ups.

▶ Students talk about how they feel after doing the activities. Discussion questions could include:

- How did you feel before the activity?
- How do you feel now?
- Why do you feel different?
- What has changed?
- What did your body use during these activities?

If students do not refer to the term 'energy', the teacher could guide discussion by asking about their energy levels.

► In groups, students brainstorm ideas about energy, recording these in words or pictures. This record of their ideas should be kept for reference later in the module so that students can identify how their understandings might have changed.

Gathering information about student learning

Sources of information could include:

- students' written/pictorial records of their ideas about energy;
- students' contributions to discussions.

ACTIVITY

Introduction to energy

Introductory

Focus

This activity provides opportunities for students to raise their awareness of energy by performing simple actions that involve energy changing from one form into another.

Materials

For learning centres:

- Resource Sheet 1, 'Activity cards'
- paper pinwheels
- torches

Teaching considerations

Resource Sheet 1

Use the cards on Resource Sheet 1 to set up learning centres for each of the actions that students perform during this activity. To prevent time delays, provide several sets of objects (where required) and cards at each learning centre.

Safety

Students should not shine torches into each other's eyes.

Working scientifically

Time: 30 minutes

Making observations
Predicting
Applying ideas and concepts
Discussing thinking

▶ Students move around the learning centres, recording their predictions, actions, observations, and ideas about where or when each action could be useful. They can use a table like the one below to record this information in writing or pictures.

Investigating actions

What I think will happen	What I did	What happened	Where or when this action could be useful

▶ Students report and discuss their observations. With teacher guidance, they relate these to the concept of energy (see 'Current scientific conceptions', p. 3) and identify the type of energy produced by each of their actions — heat, sound, movement and light.

Gathering information about student learning

Sources of information could include:

- students' completed tables;
- students' contributions to discussions.

ACTIVITY

Energy use in the classroom

Developmental

Focus

This activity provides opportunities for students to raise their awareness of where energy is used in the classroom.

Materials

No particular materials are required.

Teaching considerations

Energy

Students will have various ideas about the meaning of energy. Throughout the activity, emphasise discussion and discovery. In particular, encourage students to identify items that use a range of energy forms, not just those that use electrical energy — for example:

- mobiles hanging from the ceiling depend on kinetic energy of the wind for movement;
- some cassette players use chemical potential energy from batteries;
- filters and novelty objects in fish tanks use kinetic energy of moving water;
- solar calculators use light energy from the sun.

Safety

Students' investigation of energy use is likely to include observing appliances that are plugged in and working. Inform students about safe practices for observing electrical appliances. For example, do **not**:

- turn power switches on or off;
- plug in or unplug equipment;
- turn equipment on or off;
- get too close to hot objects or to appliances with moving parts — for example, light globes, lamps, fans.

Electrical equipment should be operated only by the teacher.

Working scientifically

Time: 30 minutes

Collecting information
Exploring phenomena
Looking for patterns
Seeking reasons
Summarising and reporting

▶ With assistance from the teacher, students compile a class list of things in the classroom that use energy. They then form small groups and classify the listed items according to their own criteria. In the class group, students share explanations for their classifications.

▶ In the class group, students talk about the uses made of energy in the classroom. With teacher assistance, they record their ideas in a list under the heading 'In the classroom we use energy for . . .'

Gathering information about student learning

Sources of information could include:

- students' contributions to discussions;
- students' explanations for grouping things that use energy;
- students' contributions to the class lists.

ACTIVITY

Energy use in the school

Developmental

Focus

This activity provides opportunities for students to identify things in the school environment that use energy and to discuss how these are used.

Materials

No particular materials are required.

Teaching considerations

Selecting areas for investigation

This activity supports and extends ideas introduced in the previous activity, 'Energy use in the classroom'. Select three areas of the school where some further uses of energy are evident — for example, playground, library, hall or tuckshop. Choices will depend on facilities and situations in individual schools.

Assistance for students

This activity may require students to work in areas of the school that are unfamiliar to them. It is recommended that students work in small groups and that adult helpers be available to help them record ideas.

Safety

Inform students about safe practices for observing electrical equipment.

Working scientifically

Time: 60 minutes (30 minutes for the activity; 30 minutes to record findings)

Collecting information
Exploring phenomena
Seeking reasons
Summarising and reporting

▶ In small groups, students visit at least three different areas of the school and identify things that use energy. They can record these in words or pictures in a table like the one below.

Where energy is used

Place in the school	Things that use energy
Tuckshop	Refrigerator, fan, stove

▶ In the class group, students share their findings and discuss the uses made of energy in the school. With teacher assistance, they record their ideas in a list under the heading 'In the school we use energy for . . .'

Gathering information about student learning

Sources of information could include:

- students' completed tables;
- students' contributions to discussions;
- students' contributions to the class list.

ACTIVITY

Energy use at home

Developmental

Focus

This activity provides opportunities for students to identify things in their homes that use energy and to discuss how these things are used.

Materials

No particular materials are required.

Teaching consideration

Safety

Advise students to ask their parents/carers to supervise and help them complete the part of this activity done at home. Also inform students about safe practices for observing electrical equipment.

Working scientifically

Time: Over a period of 1 week at home; 30 minutes at school

Collecting information
Exploring phenomena
Looking for patterns
Seeking reasons
Making comparisons
Summarising and reporting

▶ In three different areas of their homes, students identify things that use energy and explain their functions or purposes. For example, a refrigerator uses energy to keep food cool, and a toaster uses energy to turn bread into toast. Students record their findings in words or pictures in a table like the one below.

Using energy at home

Place in the home	Things that use energy	What these things are used for
My bedroom	Fan	To keep cool
	Lamp	To see in the dark
	Wind-up toy	To play

▶ Students report their findings and explanations to the class. They discuss similarities and differences in energy use at home and at school.

Gathering information about student learning

Sources of information could include:

- students' completed tables;
- students' contributions to discussions.

ACTIVITY

The sun as a source of heat energy

Developmental

Focus

This activity provides opportunities for students to use their senses to identify some effects of heat energy from the sun.

Materials

- umbrella(s)

For each student:

- plan of school playground including trees or shaded areas (provided by the teacher)
- drawing and colouring materials

Teaching considerations

Safety

Inform students about ways of protecting themselves from the sun during outdoor activities.

Students should not look directly at the sun.

Working scientifically

Time: 50 minutes

Exploring phenomena
Making observations
Analysing
Illustrating

▶ Students move out into the playground. Directed by the teacher, they stand still, close their eyes and turn around two or three times so that they do not know which way they are facing. Keeping their eyes closed and remaining still, students concentrate on where the sun is warming their bodies. Questions and instructions to assist thinking could include:

- Does one side of your body feel warmer? Point to the warmer side.
- Keeping your eyes closed, point to where you think the sun is.
- Why aren't the other parts of your body as warm as the side you pointed to before?

▶ Students stand in the shade of a building or tree, close their eyes, remain still and describe how they feel. Questions to assist thinking could include:

- How does standing in the shade feel different from standing in the sun?
- Does your body feel warmer or cooler?

▶ In the open again, students investigate the effects of shielding the upper then lower portions of their bodies from the sun with an umbrella. This can be done as a demonstration with one or two students or in pairs or small groups depending on the number of umbrellas available. Students describe how their bodies feel as the different parts are shaded. Questions to encourage comments could include:

- When the upper part of your body is shaded, does it feel different from the lower part? How?
- When the lower part of your body is shaded, does it feel different from the upper part? How?

▶ Using the plan of the school playground, students do the following:

- draw the sun;
- draw themselves playing in the sun;
- shade in red the places they think will be hot when the sun is out;
- draw a red line on the pictures of their bodies to show the side they think will be hotter.

▶ Students discuss the effects of the sun and identify sun-safe practices. Questions to guide discussion could include:

- What effect does the sun have on your body?
- What could happen if you spent a long time in the sun?
- How can you protect yourself from the sun?

▶ Students draw pictures or make a list of actions they take to protect themselves from the sun in the school playground.

Gathering information about student learning

Sources of information could include:

- students' contributions to discussions;
- students' drawings showing the sun and its effects in the playground;
- students' pictures/lists about sun protection.

ACTIVITY

The sun as a source of light energy

Developmental

Focus

This activity provides opportunities for students to identify some effects of light energy.

Materials

- overhead projector or spotlight or lamp

Teaching considerations

Light and shadows

Light cannot pass through opaque objects and *light travels in straight lines*. Consequently, the area behind an opaque object is not lit, and a shadow is formed. The shape of the shadow is similar to the shape of the opaque object. Translucent objects let some light pass through and a faint shadow is cast behind them. Transparent objects let most light pass through and do not cast a shadow. A shadow is formed on the opposite side of an object to the source of light.

The exploration of light energy from the sun in this activity requires fine and sunny conditions.

Students with vision impairment

Some students with vision impairment may need assistance for this activity. Seek advice from their support teacher.

Safety

Inform students about ways of protecting themselves from the sun during outdoor activities.

Students should not look directly at the sun.

Working scientifically

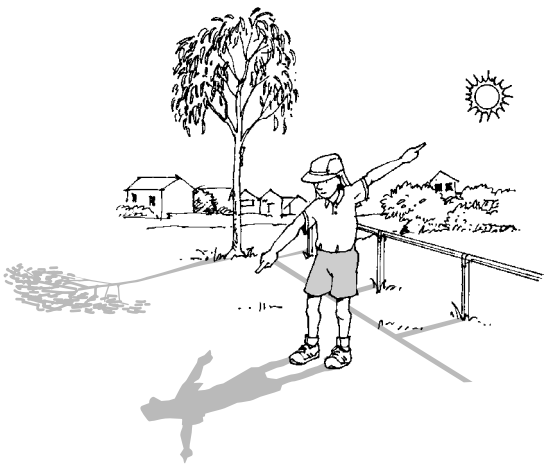
Time: 50 minutes

Exploring phenomena
Making observations
Discussing thinking

▶ Students brainstorm ideas about things at school and home that provide light. They discuss night and day and the source of daylight.

▶ Students move out into the playground. With teacher direction and assistance, they do the following:

- stand with their backs to the sun;
- point to where the sun is;
- point in the direction of their shadow with the other hand;
- observe the shadows of their bodies;
- identify other shadows in the playground.



▶ Students share and discuss their observations. Questions to guide thinking could include:

- Does everyone's shadow point in the same direction?
- In which direction is the shadow pointing?
- Why does your shadow look like you?
- What is making this shadow?

▶ Using another light source such as an overhead projector, spotlight or lamp, students explore shadows further by making moving shapes. Questions to guide thinking and exploration could include:

- Why does the shadow look like . . . 's hand? (Use the name of the shadow maker.)
- Why do we see light only in front of the lamp and not on walls behind it or to the side?
- Why is this part (the shadow) dark?

▶ Guided by the teacher, students discuss the concept of light and shade and the information this activity provides about light energy — that is:

- Light travels in straight lines and cannot go round corners.
- Light cannot pass through some things.

Gathering information about student learning

Sources of information could include:

- students' observations;
- students' contributions to discussions.

ACTIVITY

Making stringed musical instruments

Developmental

Focus

This activity provides opportunities for students to investigate sound as a form of energy and to use sound creatively.

Materials

- rubber bands of different thicknesses
- objects for making stringed instruments (e.g. boxes, cake tins, rubber bands, string)

Teaching considerations

Provide a variety of materials so that students can create a range of different musical instruments with different characteristics.

Sound energy
Throughout this activity, encourage students to think about how sound is created. Sound requires a source of energy to create vibrations and a medium (solid, liquid or gas) to carry it to the eardrum.

Students with hearing impairment
Some students with hearing impairment may need assistance for this activity. Seek advice from their support teacher.

Working scientifically

Time: 45 minutes

Exploring phenomena
Handling materials
Describing
Improvising

▶ In pairs, students explore sound by:

- stretching a rubber band and listening to find out whether this makes a sound;
- plucking the stretched rubber band in different ways to try to make different sounds;
- stretching the rubber band to varying lengths to find out if this changes the sound it makes when plucked;
- observing the movement of the rubber band;
- experimenting with rubber bands of different thicknesses.

Students record their observations in words or drawings.

▶ In the class group, students report and discuss their observations and identify similarities in what they observed. Questions to guide discussion could include:

- Was any sound produced when the rubber band was not moving?
- When you plucked the rubber band, how did it move?
- How did the sound of the rubber band change as it was stretched further and further?
- How did the sound change as the thickness of the rubber band changed?

► Students use rubber bands and other materials to create their own unique stringed musical instruments. They then play the instruments individually or in groups for the class. Students should also explain how sound is created in their instruments. If they wish, they could support their explanations with drawings.

Additional learning

► Guided by the teacher, students discuss the idea that sound can be an unwanted by-product of moving things — for example, squeaking hinges, squealing tyres, noisy aeroplanes and cars.

Gathering information about student learning

Sources of information could include:

- students' investigations and reports;
- students' musical instruments and explanations of how these produce sound.

ACTIVITY

Home-made drums

Developmental

Focus

This activity provides opportunities for students to explore the nature of sound energy.

Materials

- small tin cans (e.g. soup tins) or cake tins
- balloons or plastic wrap
- rubber bands or pieces of elastic
- small wooden sticks (e.g. paddle-pop sticks)
- 'hundreds and thousands' confectionery

Teaching considerations

Sound energy

The exploration of a drum's movements and sounds in this activity provides visible evidence of the nature of sound energy. Students are able to observe the drum skin vibrate and relate this to the sounds produced. Organise students so that they can take full advantage of hands-on experiences with the materials available and thus begin to understand some essential features of sound as a form of energy. Encourage students to recognise that other instruments and devices that produce sound also have parts that vibrate — for example, speakers on a CD or cassette player.

Students with hearing impairment

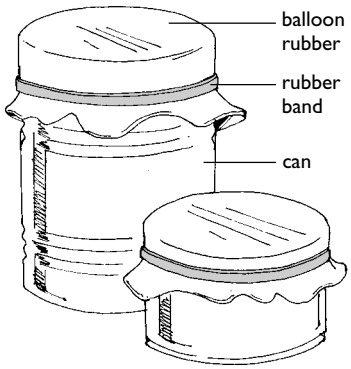
Some students with hearing impairment may need assistance for this activity. Seek advice from their support teacher.

Working scientifically

Time: 30 minutes

Exploring phenomena
Seeking reasons
Constructing and using models
Describing

▶ Individually or in pairs or small groups, students construct a drum by stretching and securing balloon rubber or plastic wrap across the open top of a tin can to make a 'skin'. They then test the sounds the drum can produce by tapping the skin with a paddle-pop stick. If the sound is not clear, the skin may need to be stretched more tightly across the opening. Alternatively, students could tap the side of the tin.



▶ Once they have been able to produce a clear sound from the drum, students place a few hundreds and thousands or similar small objects (for example, poppy seeds) on the skin. They then tap the drum in various ways to produce different sounds and observe the motion of the hundreds and thousands. They record their observations in words or pictures.

► Students review the investigation by:

- discussing the nature of the sounds produced;
- relating the nature of the sound to any differences in the movement of the hundreds and thousands;
- suggesting why the hundreds and thousands moved so vigorously.

► Students name some other musical instruments and sound-producing devices and identify which parts of these vibrate.

Additional learning

► Students investigate the different sounds produced by:

- drums made from small and large cans;
- drums with tight and loose skins;
- drums played with different types of drumsticks.

► The investigation could be extended through the use of bongo drums, snare drums, a kit of drums, tambours or tambourines.

Gathering information about student learning

Sources of information could include:

- students' contributions to discussions;
- students' records of the investigation.

ACTIVITY

Straw football

Developmental

Focus

This activity provides opportunities for students to investigate the effects and uses of wind energy.

Materials

- at least 2 drinking straws for each student
- small amount of water paint (made with food colouring or powder paint)
- white paper
- a table-tennis ball for each group
- large table or four desks joined together per group

Teaching considerations

Noise in the classroom

Because of its competitive nature, the straw football game in this activity is likely to generate considerable noise.

Students with vision impairment

Some students with vision impairment may need assistance for this activity. Seek advice from their support teacher.

Safety

Straws used in this activity should be thrown away after students have used them.

Working scientifically

Time: 30–45 minutes

Exploring phenomena
Making observations
Playing
Clarifying ideas and concepts
Exploring and elaborating ideas

▶ In pairs, students blow through a drinking straw to move drops of paint around on a sheet of paper. They observe how the paint drop moves in various ways depending on how it is blown. For further exploration, students blow through a straw to move a table-tennis ball around in various directions. They investigate how wind (air being blown through a straw) can vary the speed and angle at which the ball moves. During the follow-up class discussion, students share ideas about:

- what was happening as they blew air through the straw;
- what made the ball move faster or more slowly;
- how the angle at which the ball travels can be changed.

▶ Students test their knowledge by playing a game of straw football:

1. Two teams (each with four or five students) face each other across a table.
2. By blowing through straws, the teams compete to push a table-tennis ball off the end of the table opposite to where they are sitting. (The attacking team will be trying to move the ball forward; the defending team will be trying to blow it back.)
3. Teams score 'goals' each time they succeed in making the ball roll off the appropriate ends of the table. The first team to score three goals wins.

A round-robin competition could be held to determine the best straw football team in the class.

► Students identify and discuss other objects that use wind energy — for example, sailboats, parachutes, windmills and wind generators. They could make one of these objects, describe how the movement of air makes it work and explain its uses.

Gathering information about student learning

Sources of information could include:

- students' contributions to discussions;
- techniques students used during the game;
- objects students made to show their understanding of wind energy.

ACTIVITY

Electricity

Developmental

Focus

This activity provides opportunities for students to recognise that electricity is an important form of energy in our everyday lives.

Materials

- a selection of small electrical appliances (e.g. toaster, heater, hair drier, computer, food processor, electric beaters, lamp)
- pictures of large appliances (e.g. refrigerator, washing machine, photocopier, television, video recorder, stereo system)

Teaching considerations

Forms of energy

Throughout this activity, encourage students to talk about energy and to recognise that there are a few forms of energy that are used in many different situations. Also encourage them to recognise that different forms of energy are used for different purposes — for example, heat is used to cook food, and light helps people to see.

Safety

Take care with the placement and use of all appliances. Appliances should not be plugged in unless an adult is going to supervise their use.

Inform students about safe practices for observing electrical appliances.

Working scientifically

Time: 20 minutes

Making observations
Making links
Describing
Discussing thinking

▶ Students move round the display of appliances, identify each one and, in pictures or words, record what it is used for in a table like the one below. Some students may need help to record responses or to identify the uses of appliances that are unfamiliar to them.

Investigating appliances

Name of appliance	What it is used for
Desk lamp	Light
Cassette player	To play music

▶ In the class group, students share ideas about the uses of the appliances and identify the main forms of energy used when the appliances are working. They should recognise that only a few forms of energy are used — for example, heat (toaster, hair drier), sound (stereo system, television), movement (hair drier, clothes drier), light (lamp, television). Students compile and display a list of the forms of energy identified.

Gathering information about student learning

Sources of information could include:

- students' records of the uses made of the appliances;
- students' contributions to the discussion about forms of energy.

ACTIVITY

The world around us

Culminating

Focus

This activity provides opportunities for students to identify the different forms of energy within their communities.

Materials

One copy of the following enlarged to A3 size for each group:

- Resource Sheet 2, 'Energy in the world around us: In the town'
- Resource Sheet 3, 'Energy in the world around us: In the country'
- Resource Sheet 4, 'Energy in the world around us: At the sea'

Working scientifically

Time: 30 minutes

Making observations
Inferring from data
Clarifying ideas and concepts
Discussing thinking

▶ In groups, students identify and colour code the forms of energy evident in the pictures on Resource Sheets 2, 3 and 4. For example, all instances of movement could be blue; all instances of sound could be red.

Resource Sheets 2, 3, 4

▶ Questions to encourage discussion during the activity could include:

- Is there one form of energy more common than others?
- Which form of energy is most important to our community?
- Do any objects provide more than one form of energy?

Gathering information about student learning

Sources of information could include:

- students' colour-coded pictures;
- students' contributions to discussions.

ACTIVITY

Camping

Culminating

Focus

This activity provides opportunities for students to make links between the way people live and the ways a household uses energy to help get 'work' done.

Materials

- tents and groundsheets
- wood to make a fire or a barbecue
- food for cooking

Teaching considerations

This activity could be incorporated in the school's Science Week events. Setting up the camp site is very time consuming so it is advisable to involve other teachers and students in its use.

Choose a suitable place for the camp site such as the school oval or an environmental area. Extra adults or older students will be needed for various parts of the activity — for example, putting up tents, assisting with discussion in the tents, making the fire, preparing the barbecue and cooking food.

Safety

Inform students about safe practices for camp-fire activities.

Working scientifically

Time: 90 minutes

Looking for alternatives
Recognising and analysing options
Suggesting

▶ At the camp site, students form small groups and sit in a tent with an adult. They discuss what it would be like if the tent were their home somewhere in the bush and the differences this would mean to everyday life. Questions to guide thinking could include:

- Could you watch TV or play computer games? Why not?
- What would be different about having a shower here and at home?
- How would you be able to keep warm?
- What could you use to help you see at night?
- What would you eat?
- How would you keep your food fresh?
- How would you cook your food?

▶ The camp fire also provides opportunities to heighten students' awareness of energy in the world around them. For example, students can:

- feel and describe the heat coming from the fire and discuss the changes they feel as they move further away from the fire;
- watch the food cook and describe the changes taking place.

Gathering information about student learning

Sources of information could include:

- students' contributions to discussions.

Activity cards

R1

A Rub your hands together very quickly.

1. On your recording sheet, write or draw what you **think** will happen.
2. Do the action.
3. On your recording sheet, write or draw what happened.

B Clap your hands together.

1. On your recording sheet, write or draw what you **think** will happen.
2. Do the action.
3. On your recording sheet, write or draw what happened.

C Blow or flick the pinwheel.

1. On your recording sheet, write or draw what you **think** will happen.
2. Do the action.
3. On your recording sheet, write or draw what happened.

D Turn on the torch.

1. On your recording sheet, write or draw what you **think** will happen.
2. Do the action.
3. On your recording sheet, write or draw what happened.

Energy in the world around us: In the town

R2

Resource Sheet 2

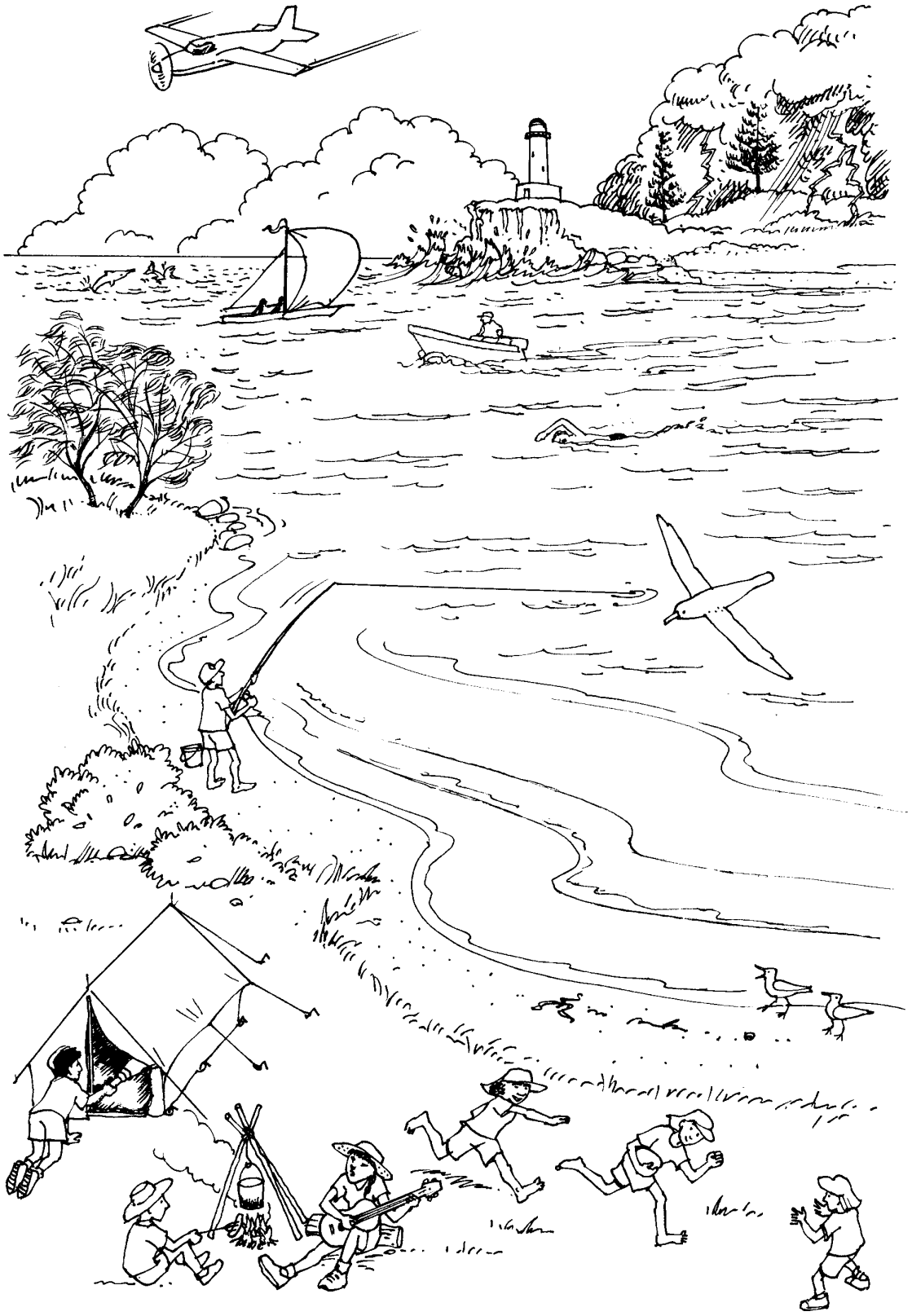
Energy in the world around us: In the country

Resource Sheet 3

Energy in the world around us: At the sea

R4

Resource Sheet 4



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This sourcebook module should be read in conjunction with the following Queensland School Curriculum Council materials:

Years 1 to 10 Science Syllabus
Years 1 to 10 Science Sourcebook: Guidelines
Science Initial In-service Materials

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