firesafe 3

A Science and Technology Syllabus Support Resource

for K-6 Teachers

FIREWISE

A free educational publication
by NSW Rural Fire Service

Introduction:

"Firesafe" offers a complete Science and Technology K-6 program for teachers. This program is derived from the Board of Studies (BOS) Syllabus. Headings for topics are basically the same as appear in the BOS document . Teacher learning programs can be developed from this program.

The central theme for this program is fire safety and awareness. The motive for this theme is to reduce the number of preventable fires that occur in our society and to reduce the number of injuries, deaths and damage that result from fires. Firesafe aims to complement the NSWRFS Fireguard for Kids Program which is already operating in many schools.

Teachers please note:

The activities in this workbook can be photocopied without permission provided that the NSW Rural Fire Service is acknowledged as the source.

Firesafe 1,2 & 3 are **FREE** publications of the NSW Rural Fire Service and are available in class sets.

Other resources

- K-6
  Firesafe 1,2 & 3
- 7-12
  Fire Science 1,2 & 3
- A comprehensive list of **FREE** resources is available on the NSWRFS web site: **www.rfs.nsw.gov.au**

For more information and enquiries call freecall 1800 654 443

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ON THE MOVE

ON THE MOVE

OUTCOMES	TEACHING STRATEGY	RESOURCES
Recognise transport systems locally, nationally and internationally.	**1)** Identify major transport systems that operate nationwide and internationally and the goods and types of people transported. **2)** Research volumes of goods transported on various transport systems and devise a way to display this information. **3)** Research the historical development of our transport systems. **4)** Describe the changes in lifestyle which have resulted from modern transport systems.	
Recognise how the local transport system is environmentally friendly.	**1)** Investigate alternative means of transporting goods and people. **2)** Recognise problems posed to the environment by transport systems. **3)** Develop a sense of energy efficiency.	
Design modifications to a transport system to make it more efficient.	**1)** Evaluate the effectiveness of the local transport system. **2)** Identify areas of transport systems which could be improved. **3)** Investigate developments in technology aimed towards improving the efficiency of transport systems.	
Investigate the different ways used to control traffic.	**1)** List the different ways transport is controlled in towns and cities. **2)** Learn the meanings of various road signs. **3)** Design a system of signs and symbols to control the movement of people in the classroom.	

MEANING OF SIGNS

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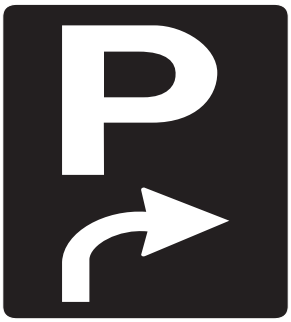

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THE BEST PLACE TO LIVE

THE BEST PLACE TO LIVE

OUTCOMES	TEACHING STRATEGY	RESOURCES
Recognise specific services within the community.	**1)** List the various services needed to make a community function. **2)** Visit the local tip or sewage works.	
Recognise the ways we can help to make our environment a safer place to live.	**1)** Ask a member of one of the local emergency services to visit the school. **2)** List the things that the local Rural Fire Brigade does to keep us safe from bush fires.	
Design and make a product or service to meet the needs of a particular person or group.	**1)** Recognise how fires are put out in small rural communities. **2)** Identify a product or service which is not supplied in your local community. **3)** Design a way in which a new product or service could be introduced into your local community.	
Investigate the supply of essential services to your community (eg. water, electricity, sewage, gas).	**1)** Trace the flow of electricity from the power station to your house. **2)** Trace the flow of water from water vapour in the sky to the tap in your house. **3)** Recognise problems associated with the supply and delivery of some essential services.	

THE LOCAL RURAL FIRE BRIGADE

1. The name of the closest volunteer Rural Fire Brigade is:

_____ Rural Fire Brigade.

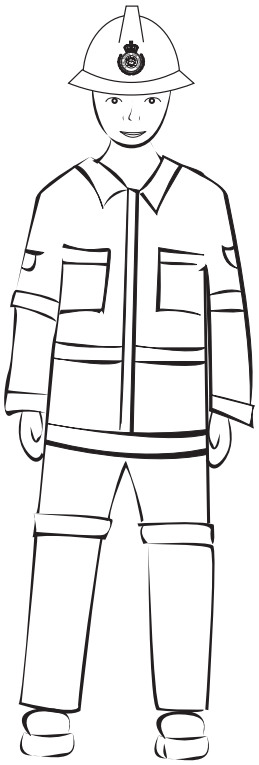
(they may still be called a Bush Fire Brigade)

2. Describe the uniform worn by members of the local Rural Fire Brigade (Bush Fire Brigade):_____

_____

_____

3. Colour in the following picture of a Rural Firefighter.



4. Find out the names of the Captain and some of the members of the local Rural Fire Brigade.

Name	Role in the Brigade
	Captain

5. In addition to extinguishing bush fires the local brigade has many other functions. **Find out what these functions are.** You might like to collect newspaper articles, collect or draw pictures to illustrate your answer.

FUNCTIONS OF THE RURAL FIRE SERVICE VOLUNTEER BRIGADE (BUSH FIRE BRIGADE) AT _____

_____

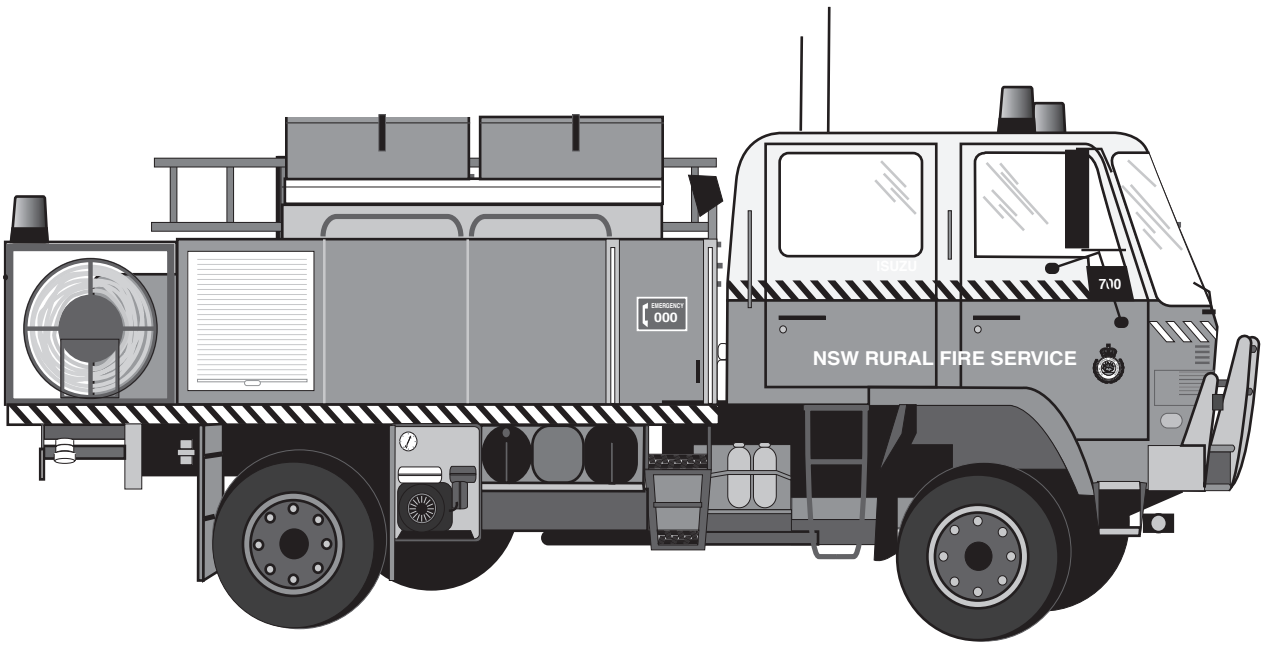
_____

_____

6.(a) Place labels onto the following diagram of a fire tanker. Choose the labels from the word bank.

WORD BANK:

pump, hose, extinguisher, crew cab, siren, aerial, storage area, beacons, water outlets, water tank, nozzle, reflective striping



WHAT IS THE BEST WAY TO EXTINGUISH A FIRE?

1. Make a list of some ways you have put a fire out or you have seen someone else put a fire out.

TYPE OF FIRE	HOW IT WAS EXTINGUISHED

2. If you were asked "Could you please put the candle out?" describe some different ways you could do it. _____

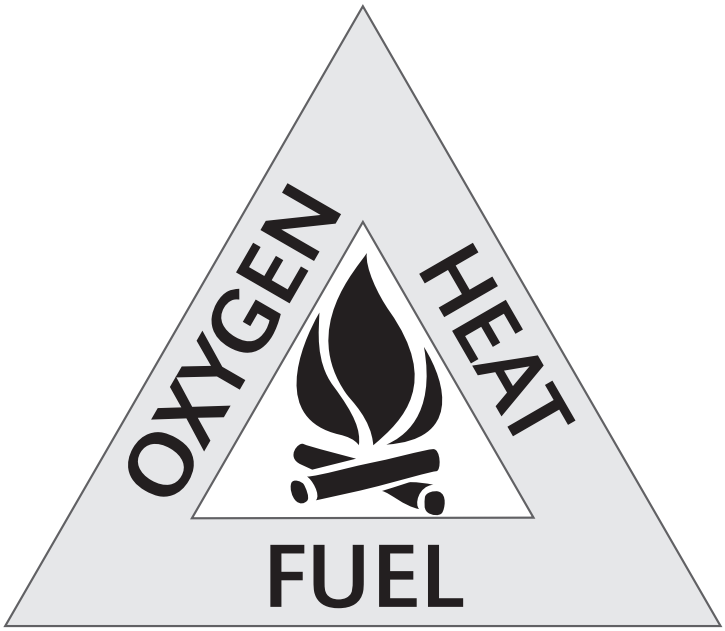
_____

_____

(You, one of your friends or your teacher might know a good joke about blowing out a candle...tell the joke or ask someone to tell it to you.)

There are 3 elements required for a fire to burn. The fire must have a plentiful supply of oxygen and fuel and there must be sufficient heat to support the fire.

These three factors make up the fire triangle.



A fire can be extinguished by removing any one of the factors in the fire triangle.

REMOVING THE OXYGEN ..... PUTS OUT THE FIRE

REMOVING THE HEAT ..... PUTS OUT THE FIRE

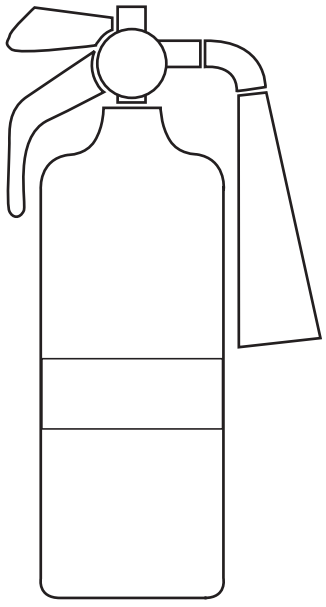
REMOVING THE _____ ..... PUTS OUT THE _____

Describe a method of putting out a fire which relies upon:

METHOD	RELIES UPON
	removing oxygen
	removing heat
	removing fuel

Your classroom should have a fire extinguisher located near the door. Locate this fire extinguisher. *Colour in the picture of the extinguisher below in the same colours as the extinguisher in your classroom and write out the label which is on the extinguisher.*

What is on the label



There may be some different types of extinguishers in the school. Look for these OR you might like to visit the local fire station. *Ask about the different types of extinguishers which can be used and what they are used for.*

PUTTING FIRES OUT WITH WATER

Water is the main way in which fire brigades extinguish bush fires and house and building fires. While you visit the fire station you might ask if you can have a squirt of a fire hose.

Water is not used to extinguish electrical, flammable liquids and cooking fat fires.

Why is water unsuitable for electrical fires? _____

_____

_____

List some flammable liquids:_____

_____

_____

When water is placed onto burning oil fires the water expands 1500 times. This pushes the boiling fat out of its container onto _____ One bucket of water might contain 10 litres of water. If this water expanded 1500 times it would occupy how much space? _____ = 1500 buckets (and takes the very hot fat and oil with it = **serious burns**).

Discuss with your teacher or a member of the fire brigade how this type of fire should be extinguished.

PUTTING FIRES OUT WITH WATER

Complete the passage by placing these words into their correct places.

fire bush water small cool
hotter dry grass burn heat

All fires must have heat.....is needed to start the ..... and to keep it going. On a very hot, ... day, a spark can give enough heat to set fire to a dry leaf or some dry ..... .

Once the fire starts, it makes its own heat. One way of putting a fire out is to ..... the burning fuel. Cool fuel will not ..... The best way to cool burning fuel is to spray ..... onto it.

Small fires only make a small amount of heat. They don't need a large amount of water to cool the fuel and put the fire out.

The ..... the fire, the more water is needed to cool the fuel. Big ..... fires are too hot to be put out with water. Fire-fighters use water to put out ..... patches of bush fire.

Answer these questions:

1. How does water put fires out?

.....

2. What sorts of fires might be put out with water?

.....

3. Why isn't water much use for putting out big bush fires?

.....

4. Some burning fuels should never be sprayed with water. Find out which ones.

.....

OUT IN SPACE

OUT IN SPACE

OUTCOMES	TEACHING STRATEGY	RESOURCES
Recognise the atmosphere as the ocean in which we live.	**1)** Describe some of the physical properties of air. • different layers • mixture of gases • air pressure **2)** Determine that oxygen is the gas of life and it is the gas which makes things burn.	
Describe what we find beyond the atmosphere.	**1)** Name the planets in our solar system. **2)** Describe the relative movements of the earth, sun and moon. **3)** Design and construct a model of the solar system. **4)** Envisage what it would be like on various planets in the solar system.	
Explain the importance of the sun.	**1)** Explain how the sun causes day and night and the seasons. **2)** Develop models to display the action of the sun on the Earth. **3)** Describe how light energy from the sun is responsible for life on the Earth. **4)** Appreciate the need for being sun smart and not becoming sunburnt. **5)** Design and construct a solar implement, eg. solar still.	
Outline the significant contribution space technology makes towards our lives.	**1)** List various ways we use space and satellites, eg. communications, navigation, entertainment.	

WHAT MAKES THINGS BURN?

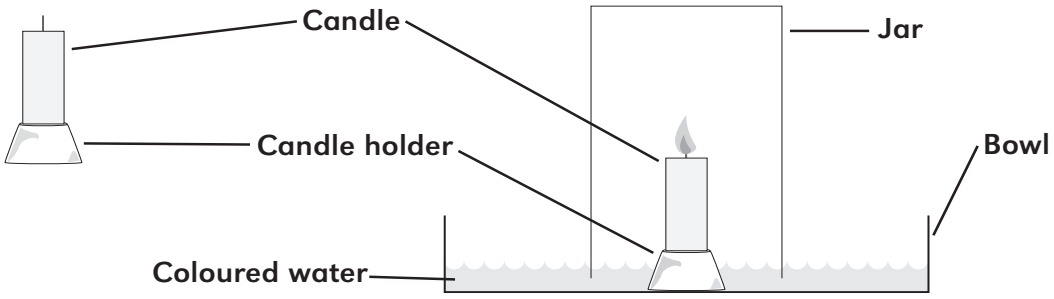
QUESTION: How much of the air is used up when something burns?

1. Attach a candle to a candle holder (this could be a block of wood which has a hole in it, or a large nut into which the candle has been screwed).
2. Place the candle into a bowl, add some coloured water and carefully light the candle.
3. Describe the way in which the candle burns.

_____

_____

4. Place a jar over the candle as shown in the diagram.



5. Describe changes in the appearance of the flame.

_____

_____

6. Describe what happens to the water as the flame goes out.

_____

_____

The water rises up into the jar to replace the air which was used up during the burning process.

The closest fraction of air that was used up was: 1/5, 1/4, 1/2, 3/4

RESEARCH:

Find out the name of the gas in the air which occupies the fraction of the air which was used up in the burning process.

The name of the gas which is responsible for burning is

_____

OXYGEN IS THE GAS WHICH MAKES THINGS BURN

Some things that people do when they are trying to light a fire are:

1. Blow a ___ ___ onto the fire

2. W___ ve something in front of the fire.

Both of these processes are aimed at getting AIR to the fire. Fire feeds upon air. The two main gases in air are:

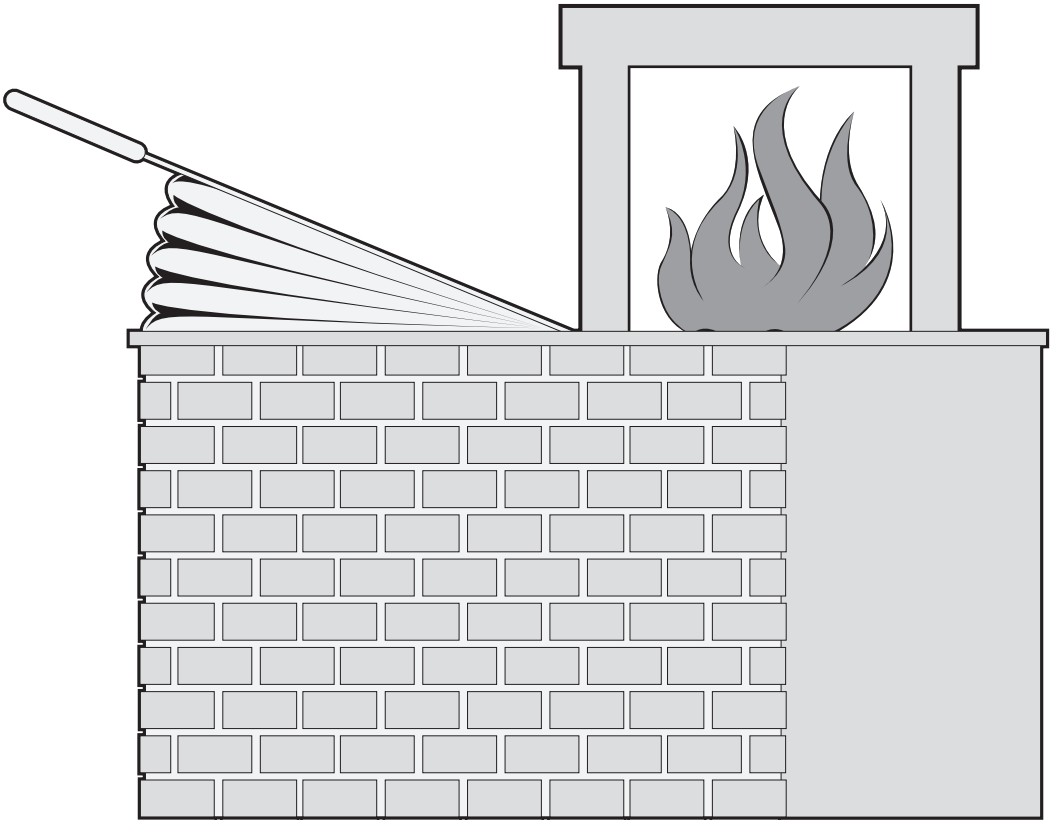
NITROGEN

OXYGEN

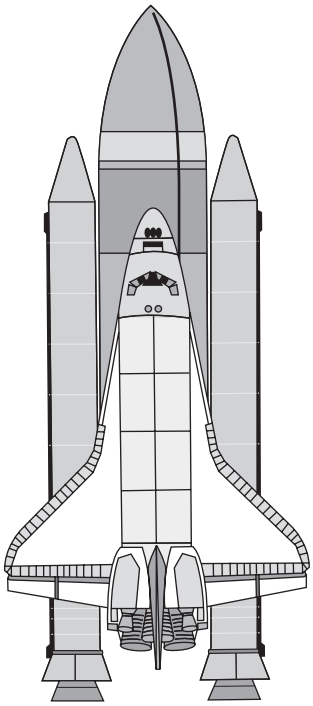
THE GAS IN AIR WHICH IS RESPONSIBLE FOR BURNING IS:

_____

A blacksmith uses a bellows to direct air onto the fire to make it burn better this makes the fire hotter so that the horseshoes, and other items become hot enough so that they can be worked.



The space shuttle takes its own supply of oxygen into space.



Suggest some reasons for this: _____

_____

_____

Imagine that you are going on a camping trip to the moon and you have to decide what you will take.

Would you take a box of matches? _____ Give some reasons for making this decision. _____

_____

Bush fires burn much more rapidly on windy days. Some reasons for this are:

1. Wind d___ ___ ___ s out the f ___ ___ l.
2. Wind brings f ___a ___ es into contact with more fuel.
3. Wind helps b_ _ _ing by i_ cre_ _ing the oxygen supply.

OXYGEN IS A VITAL COMPONENT OF THE FIRE TRIANGLE

Adding oxygen to glowing embers would make them _____

_____

Therefore taking oxygen away from a fire will extinguish the fire.

Oxygen can be removed from the fire by:
1. Smothering the fire with a woollen _____ .
2. Smothering the fire when we stop, _____ and roll.
3. W_____ someone in a woollen blanket if their clothes are on_____ .
4. Throwing d _____ onto a camp _____ .
5. Placing a cover over a candle.
6. Flooding the fire with carbon _____ . (carbon dioxide does not support burning and is used in fire extinguishers).

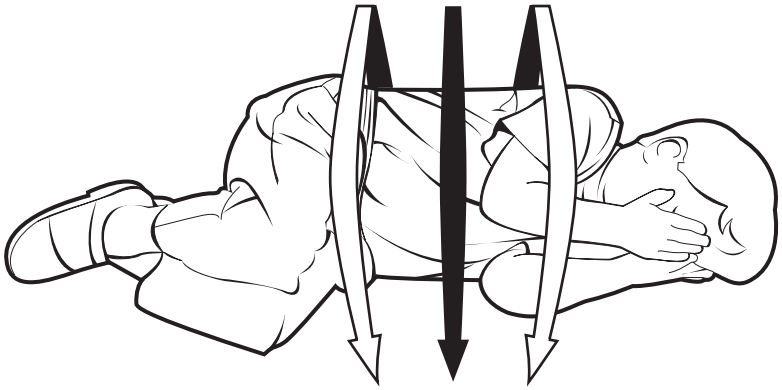
Discuss some other ways in which oxygen can either be eliminated from a fire or the supply can be reduced.

_____

_____

_____

Why will these clothes burn?



Why will these clothes go out?

ARE YOU SUN SMART?

1. Would you deliberately put your hand in very hot water? _____

2. Would you deliberately walk through flames and coals in a campfire? _____

Some people would do this but they are not very smart!

3. Would you deliberately go out into the sun for lengthy periods without a hat? _____

4. Would you sunbake in the middle of the day for several hours? _____

Some people would do this but they are not very smart!

If you are a **sun smart** person, discuss with other members of the class the things you do which make you a **sun smart** person.
*List the **sun smart** things people do to look after their bodies:*

_____

_____

_____

REMEMBER: The sun will burn you the same way that boiling water and flames will burn you. The sun is sneaky though and burns you slowly so that you are not fully aware of the damage until you are "well done".

If you do become sunburnt:

1. Keep the area cool.
2. Blisters should not be popped.
3. Handle the area as little as possible.
4. Do not apply creams and lotions.
5. Drink plenty of fluids.
6. If the burning is severe go to a doctor.

SWITCHED ON

SWITCHED ON

OUTCOMES	TEACHING STRATEGY	RESOURCES
Investigate the uses of electrical circuits in our environment.	**1)** List the ways in which we use electricity. **2)** Recognise the components of simple electrical circuits. **3)** Differentiate between conductors and insulators. **4)** Connect a bulb and battery into a simple electrical circuit.	
Understand how electricity is produced.	**1)** Examine the structure of a battery. **2)** Examine the structure of a hand generator. **3)** Examine the structure of a solar cell. **4)** Trace the flow of electricity from the power station to your home. **5)** Suggest alternative ways to generate electricity, eg. solar, nuclear, hydro, tidal.	
Develop a sense of safety when working with electricity.	**1)** Recognise electrical danger signs. **2)** Undertake an electrical safety survey. **3)** Produce an electrical safety poster.	

USING ELECTRICITY.

Our modern society has many uses for electricity. List some of the ways in which we use electricity in our home.

1._____ 2._____ 3. _____

4._____ 5._____ 6. _____

7._____ 8._____ 9. _____

10._____

HOW TO MAKE A SIMPLE ELECTRICAL CIRCUIT.

QUESTION: Can I construct a simple electric circuit to make a light globe glow?

• Observe a battery and place signs and symbols on the following diagram to show what the battery looks like.

• Electricity wants to flow from one end of the battery to the other. We use wires to allow this to happen.

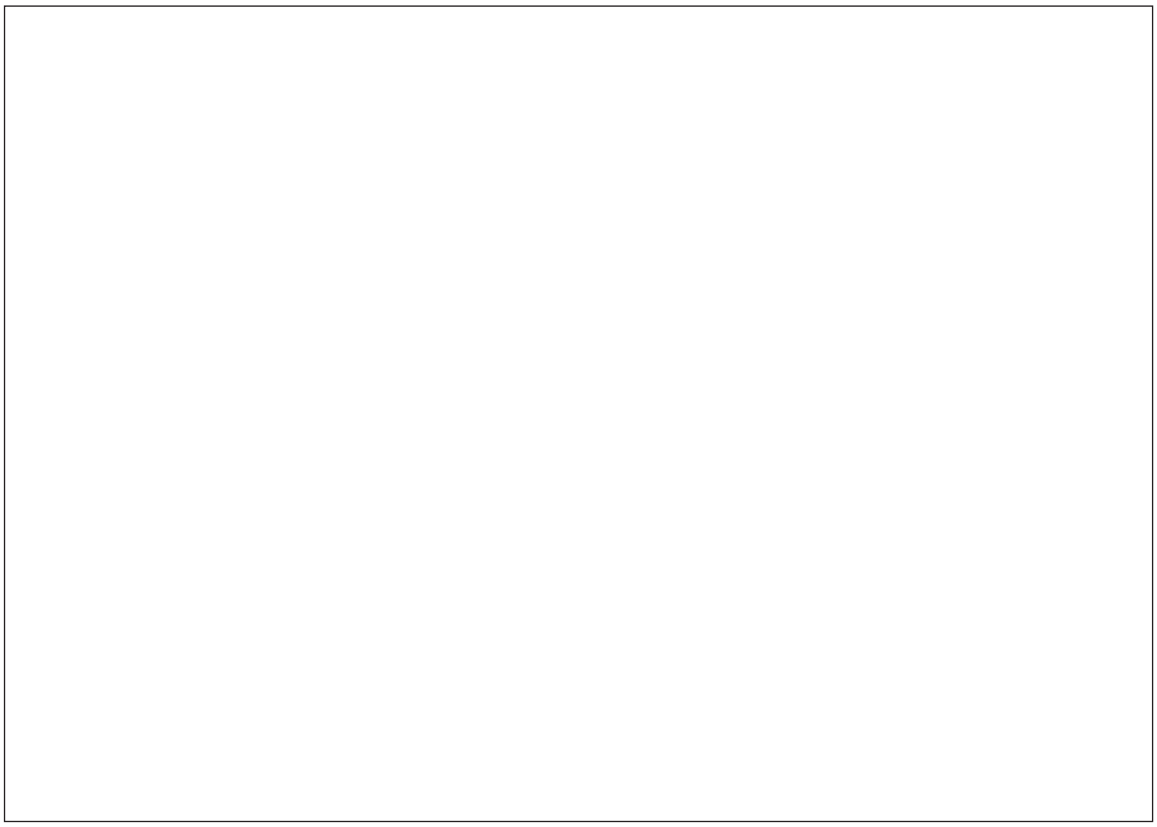
QUESTION:
What is wrapped around the wires to stop the electricity escaping as it flows from one end to the other?

• Placing objects such as bulbs, _____, _____ or _____ gives the electricity some work to do as it flows from one end of the battery to the other.

• Objects which allow electricity to flow through them are called con __ __ __ tors. Objects which do not allow electricity to flow through them are called ins __ __ __ tors. Three objects which would be good insulators are:

1._____ 2._____ 3. _____

- Connect the battery to some wires and a bulb so that the bulb glows.
- Draw a diagram to show how you constructed the circuit.



- Examine the objects in your electrical circuit to see if they get warm or hot. The objects in the circuit which become hottest are_____.
- Describe a situation where an electric circuit could become hot enough to cause a fire. _____

_____

- Describe some signs which would indicate to you that an electrical component is overheating. _____

_____

- What would you do if you did see an electrical component overheating? _____

_____

• Electricity can sometimes leak out of an electrical circuit and electrocute someone or cause a fire. Describe some ways in which electricity might leak out of a circuit.

_____

_____

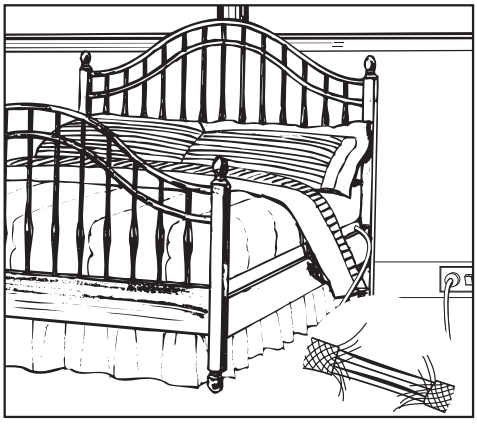
• Design and undertake an electrical safety survey in your home.

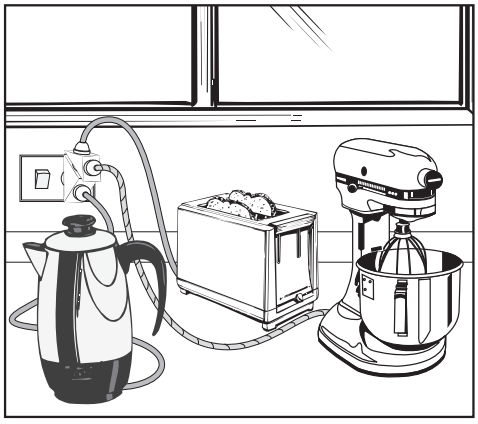
• Design a **poster** to promote the safe use of electricity.

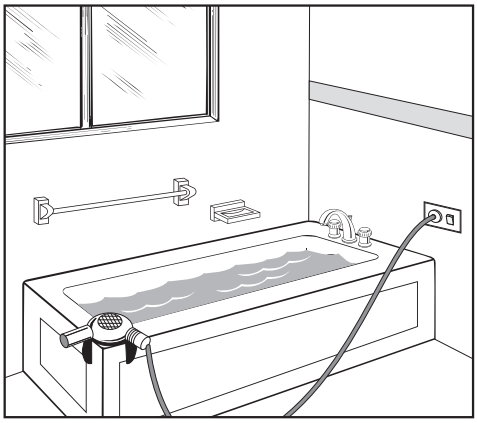
• **Write** to your electricity supplier and ask if they can send you a range of the safety literature they produce.

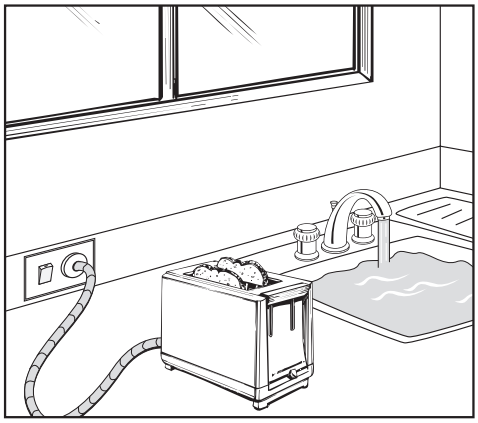
IDENTIFYING ELECTRICAL HAZARDS

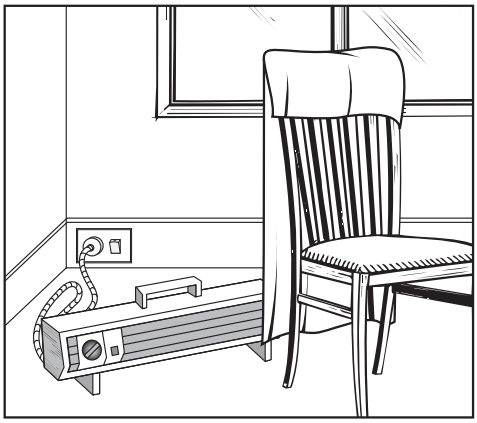
The following diagrams show some electrical hazards which could exist in your home. Underneath each diagram explain in a sentence why each is a hazard.

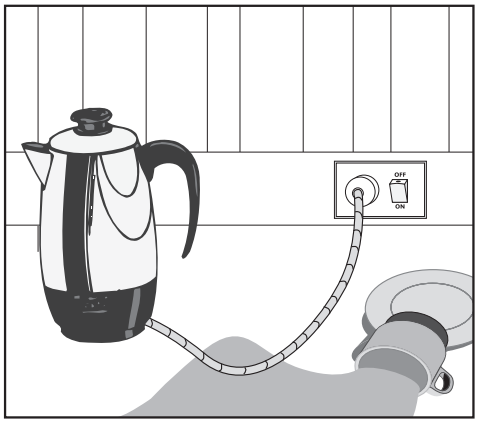












WAY OUT COMMUNICATIONS

WAY OUT COMMUNICATIONS

OUTCOMES	TEACHING STRATEGY	RESOURCES
Compare today's communication systems with those of the past.	**1)** List different ways we use to communicate over distances. **2)** Ask a senior citizen how they communicated over long distances when they were young. **3)** Compare the costs and efficiencies of different communication systems. **4)** Write a letter to distant relatives or friends. **5)** Compare modern day letter writing with that of the past. **6)** Research communication developments in Australia.	
Recognise the different ways humans communicate in different situations.	**1)** Practise a variety of letter writing techniques. **2)** Develop a message which could be sent into space. **3)** Recognise situations which require special communication systems.	

WAY OUT COMMUNICATIONS

OUTCOMES	TEACHING STRATEGY	RESOURCES
Recognise the special needs of people in different situations.	**1)** Discuss how isolation affects communication systems. **2)** Investigate communications in traditional cultures. **3)** Compare stories told to people of different ages or coming from different backgrounds. **4)** Discuss and observe communication aids for visually and hearing impaired people. **5)** Research rock paintings etc and try to put meaning to the pictures. **6)** Practise sending and receiving messages in morse code and semaphore, and sign language.	
Develop competencies in our own communication skills.	**1)** Develop competencies in speaking and writing. **2)** Become competent in using the telephone. **3)** Have experience in using a two way radio.	

REPORTING FIRES AND OTHER EMERGENCIES

It is important for you to know how to report a fire or other emergencies to the proper authorities.

1. What is the number to ring to report a fire in an emergency?

.....

2. Are there any other numbers that you could ring to report a fire?

..... **. What are the numbers and who would you be calling?** .....**.**

The emergency number is the best number to ring because it ensures that all the appropriate authorities are informed.

3. What would be the appropriate authorities during a fire in addition to the fire brigade?

.....

.....

4. When you ring the emergency number, you will get these following responses. Beside each response write down how you would answer each response:

000 RESPONSE	YOUR ANSWER
Which service do you require?	
What is your name?	
Where are you ringing from?	
What is the emergency?	
Where is the incident?	
Do you require assistance from other authorities?	
Do you have any other information?	

COMMUNICATION

S	Y	M	S	E	I	R	O	T	S	C	L	E	A	R
P	E	T	L	T	C	N	I	A	T	P	A	C	O	P
E	M	I	I	A	X	N	O	O	O	C	C	O	R	U
A	E	O	T	C	C	C	A	L	L	U	O	A	O	E
K	R	O	N	I	I	O	Y	L	R	O	C	O	N	S
A	G	O	O	N	R	R	L	A	U	T	O	O	E	N
D	E	Q	O	U	O	O	T	O	I	B	H	G	G	O
F	N	Y	O	M	O	E	H	C	S	P	M	P	A	P
J	C	E	G	M	O	F	E	T	E	J	O	A	S	S
F	Y	N	S	O	H	V	A	L	U	L	R	S	S	E
I	I	L	M	C	I	Y	E	O	I	A	E	G	E	R
R	E	T	T	E	L	T	O	C	F	R	B	R	M	D
E	O	O	O	G	N	O	E	B	D	O	M	N	O	X
B	S	E	G	N	A	H	C	D	O	L	U	Y	O	F
B	R	E	P	O	R	T	A	O	O	O	N	O	O	O

ACCURATE
ADDRESS
AMBULANCE
AUTHORITIES
CALL
CALM
CAPTAIN
CHANGES
CLEAR
COMMUNICATE
ELECTRICITY
EMERGENCY
FIRE
GO
LETTER
LOCAL
MESSAGE
NUMBER
POLICE
PRACTICE
REPORT
RESPONSE
RING
SEND
SPEAK
STAY
STORIES
TELEPHONE

Count the number of emergency OOO numbers which are hidden in the puzzle. _____

SAILING, SINKING SOARING

SAILING, SINKING, SOARING

OUTCOMES	TEACHING STRATEGY	RESOURCES
Investigate the properties of water.	**1)** Observe the change of state of water as it melts, evaporates, condenses and freezes. **2)** Measure the temperature at which water boils. **3)** Recognise water as being a solvent for many solids and gases. **4)** Identify a variety of substances which will and will not dissolve in water. **5)** Determine variables which alter the amounts of substances which dissolve in water (eg. temperature). **6)** Examine the buoyancy of a variety of different objects. **7)** Compare the buoyancy effect of salt and fresh water. **8)** Determine what stops a boat from sinking. **9)** Recognise water as being the medium used to extinguish most fires. **10)** Design and construct a toy sailing boat. **11)** Design and construct a waterwheel.	
Investigate the properties of air.	**1)** Determine that air is a mixture of gases. **2)** Observe the properties of air, eg. compressibility, pressure. **3)** Recognise the purpose of isobars on a weather map. **4)** Construct a wind mill. **5)** Compare the effectiveness of different paper aeroplane designs. **6)** List observations which tell us that air is a real substance, takes up space and has weight. **7)** Design and make a kite.	

SAILING, SINKING, SOARING

OUTCOMES	TEACHING STRATEGY	RESOURCES
Investigate the effect of pollution on air and water.	**1)** Discuss the concept of pollution. **2)** Research the causes of air and water pollution. **3)** Investigate the local community to determine levels of water and air pollution (measure solid air pollutants at various locations in the school grounds. Monitor substances found in locations in a local creek). **4)** Investigate the effects of bush fire on air quality. **5)** Investigate the effect that burning rubbish has on air quality.	

BUSH FIRES AND AIR QUALITY.

1. Complete the passage by inserting the correct word from the word bank:

ash	dense	smoke	confusion
disappear	breathing	towel	drops
high	close		

During a bushfire, smoke and _____ particles in the air rise to _____ levels. Our ability to be able to see during daylight hours _____ as the smoke is unable to _____ and spread out.

People with _____ problems, particularly aged people and asthmatics are affected in varying amounts by high exposure to _____ .

Smoke from a fire causes irritation and disorientation and _____ , making you less able to protect yourself from a fire.

To keep yourself safe, make sure you keep _____ to the ground, where the air is cooler and the smoke is less _____. Keep your mouth covered, with a damp _____ if possible.

2. What sorts of people are most affected by smoke in the air?

_____

_____

_____

_____

3. If you became surrounded by smoke what two things are going to affect your ability to protect yourself? _____

_____

_____

4. Which word or words used in the passage mean the same as dispersed? _____

_____

_____

5. What should you do if you are trapped in smoke?_____

_____

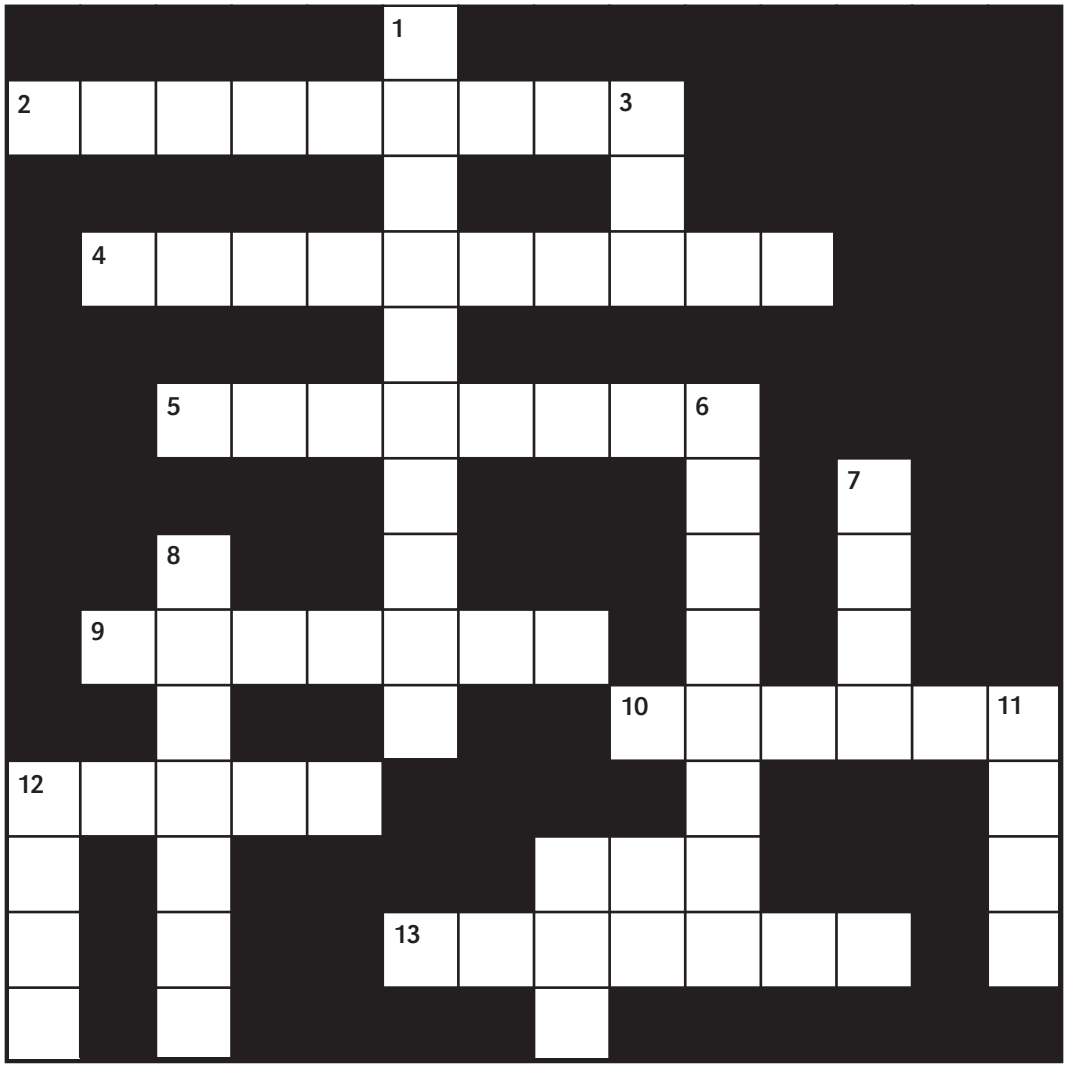
_____

6. Discuss and list how aged people may be affected by smoke from bush fires? _____

_____

_____

BUSH FIRES AND AIR QUALITY.



ACROSS:

2. fires in the bush
4. small bits and pieces
5. not comfortable
9. smoke affects how we ...
10. breathing problem
12. smoke makes you ...
13. look after

DOWN:

1. ability to see
3. look at
6. being unprotected
7. not low
8. in smoke keep close to the ...
11. not young
12. not hot

WHAT IS THE WEATHER?

WHAT IS THE WEATHER?

OUTCOMES	TEACHING STRATEGY	RESOURCES
Observe and measure aspects of weather and weather patterns.	**1)** Observe weather patterns over a period of time by collecting information from newspapers, radio and television. **2)** Measure aspects of weather, eg. temperature, wind speed and wind direction, rainfall, relative humidity. **3)** Research methods used to measure weather patterns, eg. gauges, weather balloons, satellites. **4)** Design and construct a wind vain to measure wind speed and direction.	
Use electronic information services to collect information about weather throughout NSW.	**1)** Find and use appropriate telephone and FAX numbers which can be used to obtain weather information. **2)** Use the internet to obtain up to date weather information.	
Investigate a phenomena which results from a particular set of weather patterns.	**1)** Investigate the weather patterns which prevailed during January 1994 and resulted in widespread bush fires at that time. **2)** Research natural occurences that may cause a disaster. **3)** Design a plan to cope at school in the event of a disaster, eg. fire.	
In groups, design and present a weather report.	**1)** Identify the types of information given in a weather report. **2)** Design, prepare and present the necessary information to the rest of the class.	

WEATHER PATTERNS

1. When is the hottest part of the year? _____

What is the hottest temperature that you can remember?

_____ degrees C.

List some activities you do during this time of the year. _____

_____

_____

2. When is the coldest time of the year? _____ .

What months are in this part of the year? _____ ,

_____ , _____ .

What is the coldest temperature that you can remember from your home? _____ degrees C.

What do you do in your house to keep warm? _____

_____

_____

3. What does degrees C mean? _____

Water boils at _____ and freezes at _____.

4. When is the driest time of the year? _____ .

What sorts of things do you see during the driest times of the year?

_____

_____

5. When are you most likely to have storms? _____

_____

_____

6. When are you most likely to have windy weather? _____

_____

_____

7. At which times of the year are bush fires most likely to occur?

_____

Why? _____

_____

8. At which time of the year are houses most likely to be burnt?

_____

What is the weather like at this time? _____

_____

9. Is the weather something that causes houses to burn?

_____

_____

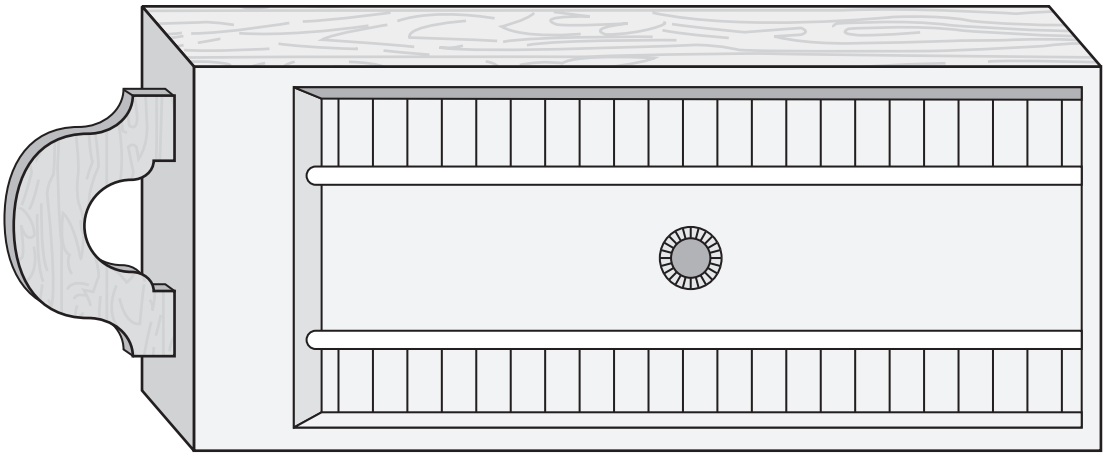
Discuss this with your teacher and other members of the class.

CREATE A MEDIA FILE SHOWING SOME WEATHER PATTERNS OVER A PERIOD OF TIME.

MEASURING TEMPERATURE

- We use a _____ to measure temperature.
- Your school should have a thermometer which measures **maximum** and **minimum** temperature.
- What does maximum mean? _____
- What does minimum mean? _____

Complete the following diagram of the maximum minimum thermometer and colour it in.



Measure the maximum and minimum temperatures over one week.

DATE	MAXIMUM TEMPERATURE	MINIMUM TEMPERATURE

• *Compare the measurements you obtained with the measurements which are read on weather reports.*

My measurements were _____ than those on weather reports.

• Where did you place your thermometer to gain your temperatures?

_____

What should be done to measure temperatures if we want to compare temperatures between different places? _____

_____

_____

• Temperature and thermometer are two words that a lot people spell incorrectly.

• How many words are hidden in temperature and how many words are hidden in thermometer?

TEMPERATURE	THERMOMETER

List some things which could be done in homes to prevent fires during cold times of the year.

_____

_____

_____

_____

KEEPING YOU AND YOUR HOME SAFE FROM FIRE DURING WINTER

Fires can start up in fireplaces, fuel stoves, and heaters at any time. To prevent unwanted fires:

- Make sure that chimneys are regularly cleaned and examined for cracks and deterioration.
- Investigate smoke coming through cracks, unusual heating of walls, floors or ceilings or discolouration of paintwork near chimneys or flues. Rectify faults immediately.
- Always place an effective anchored fire screen in front of an open fire. Special care should be taken to keep children away from open fires and heaters.
- Make sure that ashes are cold before being discarded.
- Examine and service oil and gas heaters regularly to ensure safe and efficient operation.
- Do not attempt to carry or refuel kerosene heaters while they are alight.

Answer these questions:

1. Why should chimneys be regularly cleaned and examined?

_____

2. What might smoke coming through cracks indicate?

_____

3. What would you do if the floor in front of a heater was unusually hot?

_____

4. List some reasons why fire screens should be placed in front of an open fire? _____

_____

5. Into what sort of container would you place ashes before you throw them away? _____

_____

MEASURING WIND

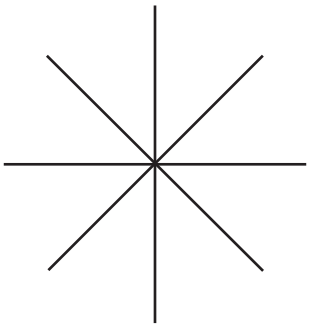
Unjumble the Words:

The two things we measure when we talk about winds are:

1. wind_____(depse)

2. wind_____(tiirdceon)

Place the appropriate compass directions onto the following grid:



- Use a compass to locate the four main directions from your school or home.
- List two objects which are in each of the main directions.

DIRECTION	OBJECTS	
NORTH	1	2
SOUTH	1	2
EAST	1	2
WEST	1	2

- When we say that we are having a westerly wind it means that the wind is coming FROM the west.
- If we are experiencing a north westerly wind it means:

_____

- Find out the direction from which the wind is coming today.

Today's wind is coming from the _____.

- Describe how you worked out the direction from which the wind is coming. _____

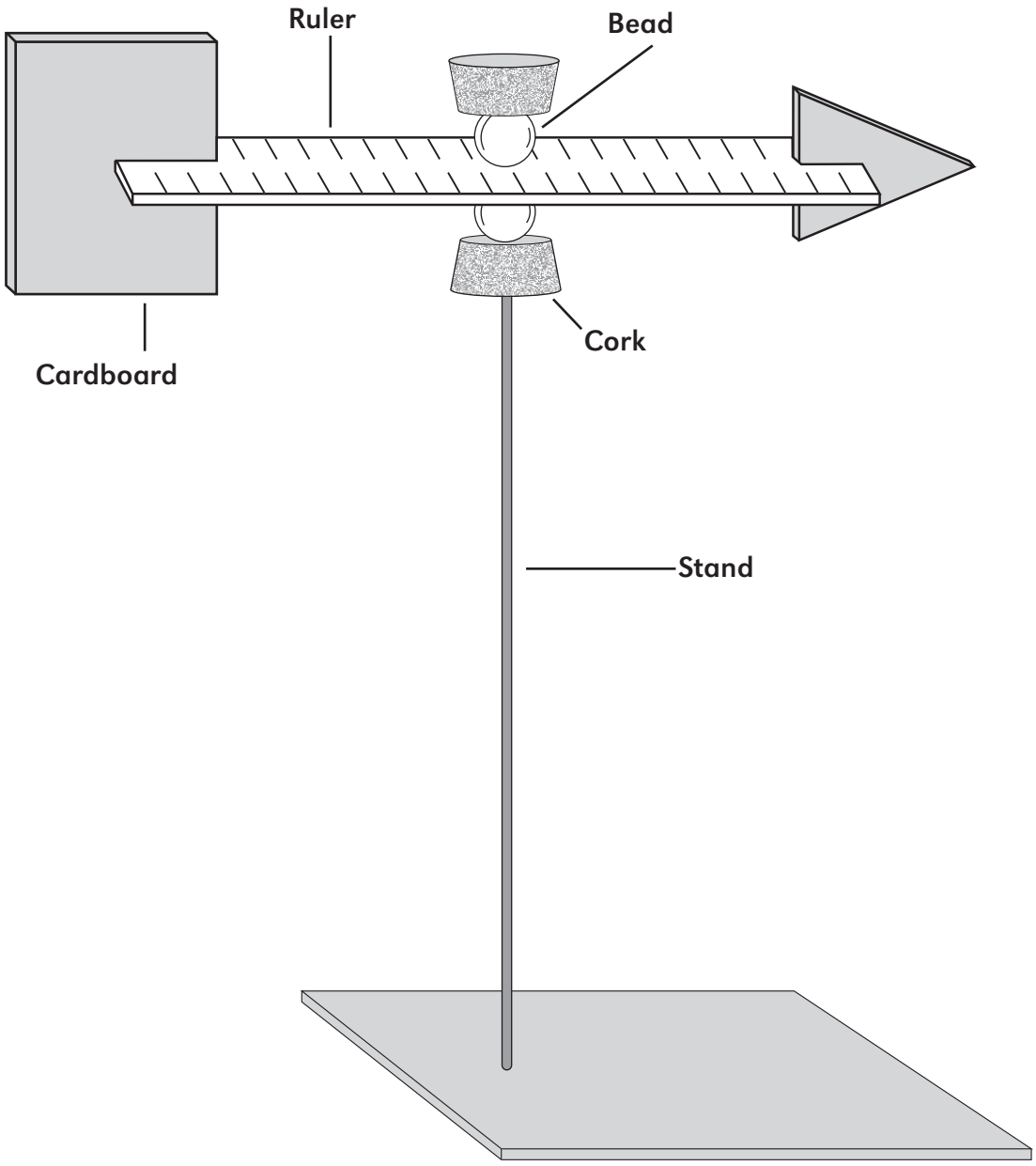
_____

_____

_____

• A **wind vain** is a simple instrument used to measure wind direction. Here is a diagram of a simple wind vain which you can make.

• Do you think the arrow will point towards the direction in which the wind is going or the direction from which the wind is coming?



THE WIND TODAY

How would you classify today's wind:

- light breeze
- gentle breeze
- strong breeze
- gale force _____

List some observations about today's wind.

1. What is the wind doing to leaves? _____
2. Is any dust raised? _____
3. What is happening to flags? _____
4. What is happening to smoke in the sky? _____
5. Are branches swaying? _____
6. Are any twigs, leaves or branches blown from trees? _____

If there is a **light breeze** you would feel the wind on your face, leaves would rustle, and flags would flap. Wind speed would be about 10 km/hr.

If there is a **gentle breeze** leaves and twigs would be in constant motion and a flag would be extended. Wind speed would be about 15 km/hr.

If there was a **strong breeze** large branches would move, wires would whistle and flags would rise upwards. Wind speed would be about 45 km/hr.

If the winds were **gale force** you would see whole trees in motion and twigs and branches might break off. Wind speed would be about 60 km/hr.

During the bush fires in NSW in January 1994 the wind speeds averaged around 40 to 50 km/hr with gusts up to 100 km/hr.

- Describe the visual effects of this wind: _____

_____

- Describe how this wind would have affected the bush fires which were burning at that time? _____

_____

WEATHER WORDS

E	C	A	L	P	E	R	I	F	T	L	K	H	X	Z
Z	R	V	S	Y	E	N	M	I	H	C	M	O	Q	R
S	E	U	A	G	F	O	R	E	T	A	E	H	S	I
U	P	Y	T	I	D	I	M	U	H	V	A	L	G	X
K	O	C	E	A	N	T	U	I	S	V	S	B	A	J
Y	R	O	L	R	R	C	E	L	S	I	U	S	L	G
X	T	L	L	E	Z	E	E	R	B	W	R	B	Q	T
K	S	L	I	X	W	R	P	T	N	E	E	R	C	S
O	U	E	T	T	I	I	D	M	U	M	I	X	A	M
T	K	C	E	F	N	D	X	W	E	A	T	H	E	R
U	E	T	H	R	D	A	R	E	T	T	U	L	F	Z
H	X	S	O	E	G	N	A	H	C	P	F	C	R	X
T	U	G	T	N	R	E	T	T	A	P	B	P	O	G
B	A	L	L	O	O	N	D	L	O	C	B	R	W	C

BALLOON
BREEZE
BUSHFIRE
CELSIUS
CHANGE
CHIMNEY
COLD
COLLECT
DEGREES
DIRECTION
FIREPLACE
FLUTTER
HEATER
HOT
HUMIDITY
MAXIMUM
MEASURE
PATTERN
REPORT
SATELLITE
SCREEN
TEMPERATURE
VAIN
WEATHER
WIND

HUMIDITY

Humidity is a measure of how much moisture is in the air. On a hot, dry day the humidity is low.

- Describe how you would feel if the humidity was high?

_____

_____

Humidity is actually measured as a percentage and is called relative humidity. If the relative humidity was 100% the air would be saturated with water vapour. This is a bit like the bathroom after you have had a hot shower.

- If the relative humidity was 0% the air would be d __ __

During the bush fires of 1994 the relative humidity reached a low of 8% on January 7.

- This should show you a link between bush fire danger and humidity.

What is this link?_____

- What other parts of the weather would contribute to the bush fire danger period?_____

- If the relative humidity is low , describe how you should be careful if you are camping?_____

_____

USING BARBECUES AND CAMPFIRES

Barbecues and campfires must be contained in a properly constructed fireplace, pit or trench. Flammable material must also be cleared from above and around the fire for at least 2-3 metres.

Never leave a barbecue or campfire unattended and make sure to extinguish it before leaving.

On a day of Total Fire Bans no fire or barbecue may be lit.

1. What is the flammable material which must be cleared around the campfire? _____

2. How could you extinguish a campfire when you leave your campsite?_____

AN ANCIENT LAND

AN ANCIENT LAND

OUTCOMES	TEACHING STRATEGY	RESOURCES
Outline changes that have occurred over long periods of time.	**1)** Identify different landforms which exist in nature. **2)** Recognise the forces of weathering and erosion which exist in nature and act to shape the Earth. **3)** Develop an appreciation of the concept of time. **4)** Research how land masses have changed over time. **5)** Develop a mental picture of what the local environment may have looked like in ancient times. **6)** Relate patterns in rocks to major geographical events. **7)** Recognise igneous, sedimentary and metamorphic rocks.	
Design and construct a model of a particular landform.	**1)** Construct a model and/or present a poster of a particular land form. **2)** Recognise the features of different landform types.	

AN ANCIENT LAND

OUTCOMES	TEACHING STRATEGY	RESOURCES
Investigate the types of animals and plants which may have existed during ancient times.	**1)** Develop ideas about fossils and how they form. **2)** Collect and/or observe a variety of fossils. **3)** Construct a model fossil from plaster of paris. **4)** Research the types of plants and animals (eg. Diprotodont) which existed in ancient times. **5)** Present a pictorial display of ancient life. **6)** Research particular areas of Australia which are rich in fossils. **7)** Explore events which may have caused the extinction of animals and plants. **8)** Discuss features of plants and animals which would make them better survivors in a harsh environment. **9)** Outline the influence of bush fires in moulding the types of animals and plants in Australia.	

FIRE - A FORCE THAT SHAPED THE LAND

Bush fires have been part of the Australian environment for millions of years. Lightning, volcanic eruptions and sparks from falling rocks were natural ways in which fires could start.

65-200 million years ago, Australia occupied a different part of the world and the continent received much more rainfall and had lots of rainforest areas. Australia was not the dry continent that it is today. Any fires would not have burnt very far and they probably didn't have much impact on the environment.

As the continent drifted northward many areas became drier. Plants developed harder leaves and thicker bark which stopped them losing moisture.

Rainfall has changed a lot over the last 300,000 years. Fossils have shown that there were many more fires during this period. The harder thicker leaves and bark enabled the vegetation to withstand fire. Fire became increasingly more important in shaping the land. Eucalypts are very successful in their adaptations to the Australian environment. They are able to survive heat, drought and fire. The oil in the leaves of the Eucalypt trees encourages fire. Many Eucalypts rely upon fire to germinate their seeds.

1. List 3 ways in which fire may start naturally:

_____ _____ _____

2. How was Australia different 100 million years ago?

_____

3. Would fire have been much of a problem 90 million years ago?

_____

4. How did the Australian continent change as it slowly drifted northward? _____

_____

5. List the changes that occurred to the vegetation as the continent became hotter. _____

_____

6. How do we know that there were lots more fires in the last 300,000 years? _____

7. Why do Eucalypts rely upon fire for their survival?_____

_____

LIGHT UP MY LIFE

LIGHT UP MY LIFE

OUTCOMES	TEACHING STRATEGY	RESOURCES
Identify various sources of light.	**1)** List various ways in which light can be produced (candles, gas lamps, glow worms, light bulbs and fluorescent tubes, torches, sun, stars, fire). **2)** Investigate the structure of a light bulb and understand its function. **3)** Compare the efficiency of light bulbs and fluorescent tubes. **4)** Use energy wisely when switching on lights. **5)** Compare the effectiveness of different types of torches.	
Analyse some of the properties of light.	**1)** Determine that light travels in straight lines and casts shadows. **2)** Design and make a variety of shadow figures. **3)** Determine that light becomes bent as it passes through one medium to another. **4)** Observe how a beam of light spreads out as it progresses away from the source. **5)** Differentiate between transparent, translucent and opaque. **6)** Examine how light is reflected from a mirror. **7)** Focus light through a magnifying glass to start a fire. **8)** Realise how bush fires may start from glass or bottles.	

LIGHT UP MY LIFE

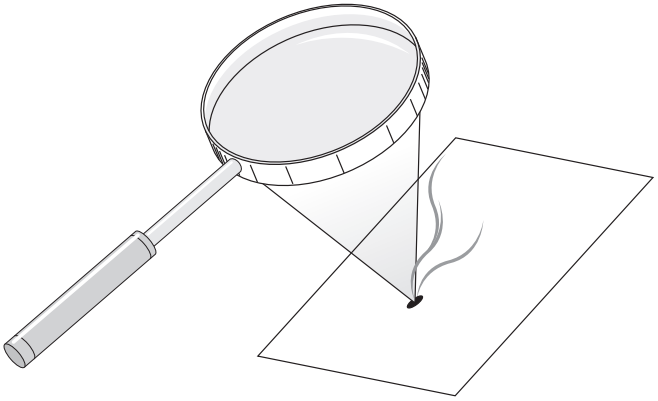
OUTCOMES	TEACHING STRATEGY	RESOURCES
Identify special uses that humans have for light.	**1)** List and research various ways in which humans take advantage of the properties of light: • photography • optical instruments such as spectacles, telescopes and binoculars • medicine - laser surgery, arthroscopy • communication through optical fibres **2)** Examine the structure of an optical instrument such as an overhead projector.	
Use light to produce some special effects.	**1)** Use a strobe light to produce "slow motion". **2)** Observe the effect of different coloured lights on coloured objects. **3)** Research special light effects used in the film industry. **4)** Understand the appearance of different coloured skies at different times and under different conditions, eg. bush fires. **5)** Investigate how light and sound can be used to create mood and feeling.	

HOW THE SUN CAN START A FIRE

It is thought that pieces of glass or bottles can start bush fire because they focus the light from the sun onto a single point and so magnify the sun's energy. In practice, this would be unlikely.

TRY BURNING A PIECE OF PAPER USING A MAGNIFYING GLASS.

DON'T CAUSE A BUSH FIRE AND DON'T FOCUS THE RAY ONTO ANY PART OF YOUR BODY OR ANY ONE ELSE'S BODY



Describe how the light had to be focussed onto the paper to make it burn. _____

_____

_____

Look at the surface of the magnifying glass. Describe its shape.

_____

_____

Broken glass and bottles have curved surfaces which bend the light and focus onto a smaller area and could magnify the sun's energy and makes things hot enough to burn.

ENVIRONMENTAL MATTERS

ENVIRONMENTAL MATTERS

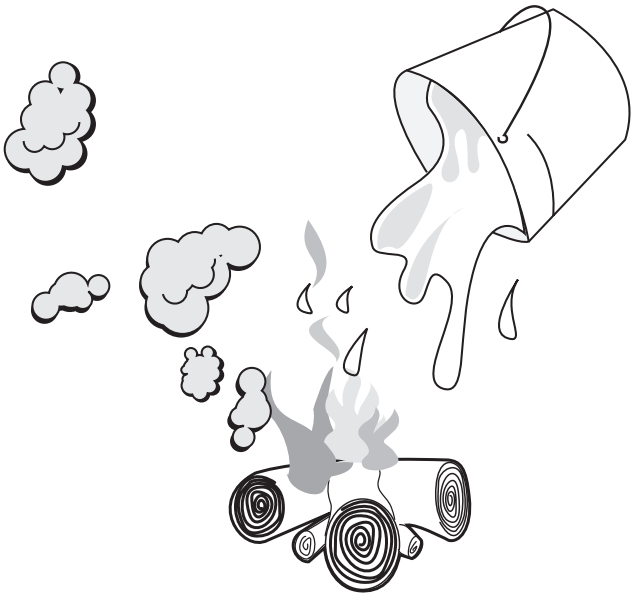
OUTCOMES	TEACHING STRATEGY	RESOURCES
Investigate the effect of human activity on environments both in Australia and the rest of the world.	**1)** Develop a media file containing articles describing the ways in which humans affect the environment. **2)** Visit an environmental park or reserve and identify characteristics of natural environment. **3)** Undertake a study of a natural environment in the local area. **4)** Understand the need for having designated environmental and wilderness areas. **5)** Identify the types of human activity which have detrimental effects on the environment. **6)** Develop ideas about ecologically sustainable activities. **7)** Investigate ways people are addressing problems of worldwide environmental damage. **8)** Make value judgements about environmental issues. **9)** Investigate the effect of bush fires on the environment. **10)** Practise activities which minimise the chances of bush fires.	
Address some problems of environmental damage.	**1)** Choose a particular environmental problem (eg. forest use and misuse, rubbish and sewage disposal, soil degradation, acid sulfate soils, use of farm chemicals) and develop ideas about how the problem can be reduced or eliminated. **2)** Develop an advertising slogan to tell the world about some type of environmental problem. Present it to the rest of the class.	

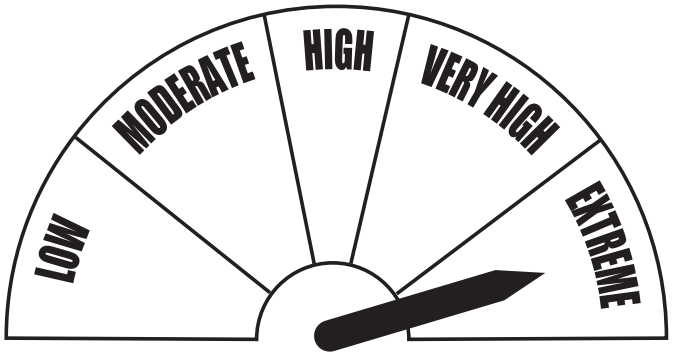
ENVIRONMENTAL MATTERS

OUTCOMES	TEACHING STRATEGY	RESOURCES
Appreciate the need to develop recycling programs.	**1)** Undertake a litter survey. **2)** Classify rubbish we produce as being recyclable or non-recyclable. **3)** Develop a recycling program for school and the home. **4)** Identify the advantages and disadvantages associated with recycling programs.	
Compare the advantages and disadvantages of renewable and non renewable resources.	**1)** Define the concept of renewable resources. **2)** List the resources we use as being renewable or non-renewable. **3)** List the advantages and disadvantages of various renewable and non-renewable resources. **4)** Recognise various alternative materials which can be used in the manufacture of various products. **5)** Design and make a product to satisfy an identified need, taking into account environmental costs.	

PREVENTING BUSH FIRES

Under each of the following diagrams write a few sentences which describe the message which the diagram is saying. Discuss this with members of the class and your teacher.





Colour in the Fire Danger Meter

ENVIRONMENTAL MATTERS

D	E	S	T	R	U	C	T	I	O	N	R	U	B	M
E	R	S	S	N	A	B	S	U	R	V	I	V	E	E
G	I	E	N	S	E	R	R	U	O	S	E	R	R	L
U	F	N	P	A	F	M	D	P	R	E	I	C	I	B
F	D	R	O	O	T	N	N	V	E	F	N	L	F	O
E	L	E	O	I	A	U	N	O	P	H	T	E	H	R
R	I	D	I	L	T	O	R	M	R	S	O	A	S	P
E	W	L	S	N	I	C	A	A	O	I	F	R	U	B
X	U	I	C	S	B	C	U	S	L	B	V	I	B	H
P	S	W	O	R	A	H	A	D	F	B	I	N	R	E
O	E	R	R	E	H	U	I	E	E	U	S	G	E	I
S	E	H	C	T	A	M	R	E	G	R	O	W	T	H
E	D	S	H	T	D	A	M	A	G	E	E	V	E	R
Y	O	N	E	I	S	N	H	A	Z	A	R	D	J	O
T	R	I	A	L	S	S	U	R	V	E	Y	S	B	S

AIR	ENVIRONMENT	LITTER	RUBBISH
BANS	EROSION	MATCHES	SCORCH
BURN	EXPOSE	NATURAL	SEED
BUSHFIRE	FOOD	PROBLEM	SURVEYS
CAMPFIRE	HABITAT	REDUCTION	SURVIVE
CLEARING	HAZARD	REFUGE	TRIALS
DAMAGE	HUMANS	REGROWTH	WILDERNESS
DESTRUCTION	ISLAND	RESOURCES	WILDFIRE

THE LETTERS LEFT OVER SPELL OUT A HIDDEN MESSAGE:

_ _

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _.

A CHANGE FOR THE BETTER

A CHANGE FOR THE BETTER

OBJECTIVES	TEACHING STRATEGY	RESOURCES
Recognise how living things are suited to the environment.	**1)** Compare and contrast the adaptation of plants and animals. **2)** Recognise that adaptation exists to enable an organism to survive in its environment. **3)** Examine adaptations of eucalypts and relate these adaptations to fire in the Australian environment. **4)** Investigate behavioural adaptations of animals during a bush fire.	
Investigate how characteristics can be passed from one generation to another.	**1)** Identify characteristics that may be inherited in humans. **2)** Observe characteristics of animals that are passed from one generation to another. **3)** Research how characteristics of domestic animals have been changed by people. **4)** Understand how nature selects those organisms which are best suited to survive.	

THE INFLUENCE OF BUSH FIRES IN MOULDING THE TYPES OF ANIMALS AND PLANTS IN AUSTRALIA

1. Describe the changes that occur to gum trees during a bush fire.

- What happens to the bark? _____
- What happens to the leaves? _____
- What happens to the branches? _____

2. How does a gum tree look 6 months after a bush fire?

- How does the bark look? _____
- Are there any new leaves? _____
- Are any parts of the tree completely dead? _____

3. After a bush fire there are lots of new seedlings. Where have they come from? _____

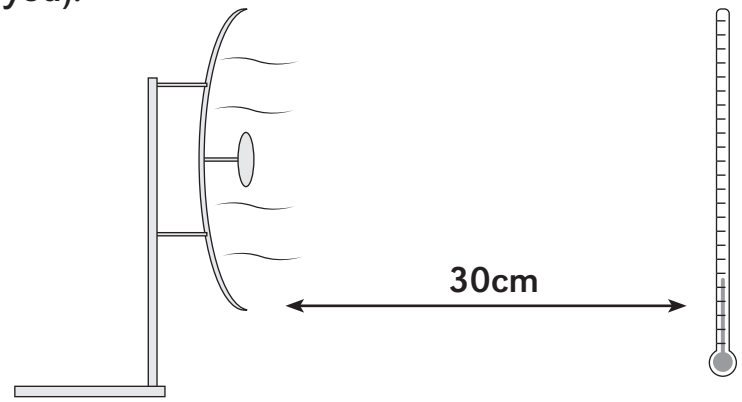
_____

DOES THE BARK PROTECT THE PLANT FROM FIRE?

AIM: Does the bark on a tree protect the tree from bush fires?

METHOD:

• Use a thermometer to measure the temperature 30 cm away from a bar heater. (Be careful, because you are working with things that can burn you).



• Place a piece of bark between the heater and the thermometer and measure the temperature again. (Make sure the thermometer is the same distance from the heater.)

• You could repeat the experiment by placing the thermometer at different distances away from the heater. (DON'T GET BURNT).

RESULT:

The temperature without the bark was: _____ degrees C

The temperature with the bark in place was: _____ degrees C

CONCLUSION:

The bark is a very good **insulator**. What does an insulator do?

_____

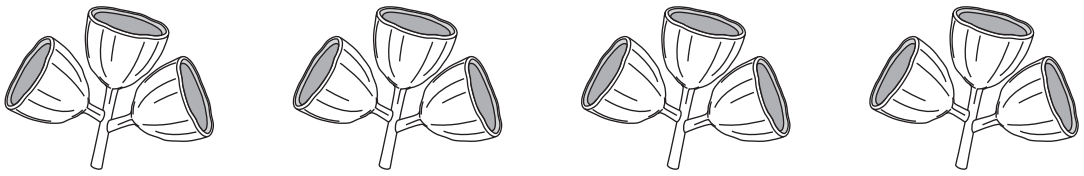
The bark protects the inside parts of the plant from intense heat and enables the plant to survive a bush fire. Gum trees are different to a lot of other trees in that the bark forms a continuous thick layer which encloses most of the vital parts of the tree.

• If you did burn yourself, what should you do?_____

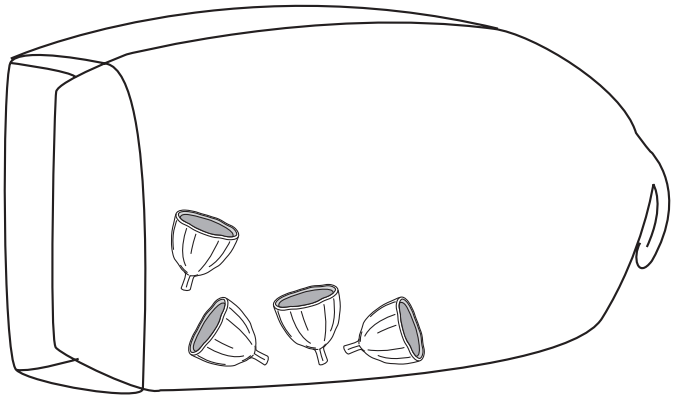
_____

GERMINATING GUM TREES

1. Collect some gum nuts from a gum tree. They should be from the same sort of tree. The tree should just have finished flowering and the cap should still be on the gum nut.



2. Place the gum nuts into a paper bag.



3. After several weeks observe the bag and the gum nuts to see if there are any seeds.

4. Place the seeds into 4 groups.

Group 1.

Place these seeds directly into the seeding mix in a margarine container.

Group 2.

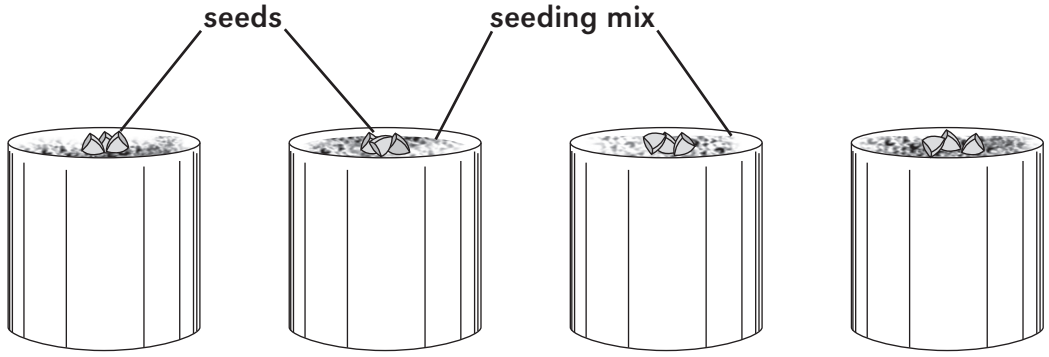
Place the seeds into the oven for 2 minutes, then place them into the seeding mix.

Group 3.

Expose the seeds to smoke and plant them into the seeding

Group 4.

Expose the seeds to heat and smoke before planting.



- **What do you expect to happen?** _____

_____

_____

_____

- **What did happen?** _____

_____

_____

_____

A CHANGE FOR THE BETTER

G	M	R	E	H	T	A	E	W	I	H	I	J	I	F
N	U	R	V	T	N	R	U	B	N	C	N	F	R	P
W	I	M	I	C	E	U	M	S	U	N	S	O	B	I
F	O	V	V	N	R	A	A	A	T	A	U	S	U	I
A	C	P	R	I	O	J	N	C	B	R	L	S	S	K
E	T	L	U	T	S	C	E	I	E	B	A	I	H	W
L	E	A	S	X	I	T	T	W	M	X	T	L	F	N
M	J	N	E	E	O	W	O	R	G	A	E	S	I	M
Z	B	T	N	R	N	L	D	O	E	J	L	C	R	A
H	J	T	P	O	F	B	J	A	Z	E	H	O	E	S
C	Y	S	B	A	R	K	M	O	E	A	F	R	K	F
Q	X	S	E	E	D	W	J	S	N	D	P	C	T	F
K	Z	R	B	H	E	A	T	G	N	R	O	H	U	A
Q	A	P	R	G	M	H	E	A	M	R	N	V	D	B
R	V	Z	R	N	K	T	L	X	L	K	X	N	B	S

ADAPT
ANCIENT
ANIMAL
AUSTRALIA
BARK
BRANCH
BURN
BUSHFIRE
CHANGE
DEAD
EROSION
EXTINCT
FIRE
FLOWER
FOSSIL
GROW
GUM
HEAT
INSULATE
LANDFORM
LEAF
NUT
PLANT
PROTECT
ROCKS
SCORCH
SEED
SURVIVE
TREE

HOW ANIMALS SURVIVE A BUSH FIRE

During and after a bush fire many animals will die. However some animals survive because they can fly out of the area to get away from the flames, they can run away from the flames or they can hide in burrows and other safe places.

During the fire snakes, yabbies, birds, frogs, small mammals, and lots of insects and lizards can survive by lying in pools of water in swamps, creeks and gullies.

Rock shelves, creek lines and roads are places where fast moving mammals like wallabies and kangaroos are able to run away from the fire.

Birds are able to fly to unburnt bush to get out of the flames. Unburnt bush provides areas for animals to recover. Rainfall is very important to help the animals recover.

Animals which have to feed every day (eg. mammals and birds) suffer the most after a fire because there is a lack of things to eat. Animals which do not have to eat every day (eg. snakes and lizards) survive longer because they do not have to continually search for food and they can hide underground.

As the burnt trees and grass begin to regrow after the fire, the animals start to move back into the area to take advantage of the new growth. Some animals actively feed on the new growth eg. kangaroos, wallabies and insects. Caterpillars hatch and feed on the new growth and the caterpillars provide food for birds and small mammals.

Any animal that has survived the flames and can move about has a good chance of surviving a bush fire.

1. List one way in which an animal is able to survive a bush fire.

_____

_____

2. How do pools of water in swamps, creeks and gullies provide shelter during a bush fire?_____

_____

3. What sorts of places provide pathways for animals to run away from the fire? _____

_____

4. What is needed to help animals recover after a fire? _____

_____

_____

5. Why do snakes and lizards have a better chance of surviving after a fire? _____

_____

6. Which animals actively feed on the regrowth after a fire? _____

_____

_____

7. What will birds and small mammals feed upon after a fire? _____

_____

_____

8. Spell these words correctly:

aminals _____ servive _____

burows _____ lizeds _____

mamels _____ gulees _____

sheltar _____ kangeroos _____

ranefall _____ insets _____

snayks _____ catupilors _____