



FIREWISE

The Friends of Veld and Forest
S C H O O L S P R O G R A M M E

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6. Learning for Sustainable Living: An integrated learning resource for environmental education - Bird Life South Africa 2000
7. Playing with Fire (Ministry of Education and Culture - Namibia) - Enviroteach
8. Tools of the Trade Skills and Techniques for Environmental Education in Namibia -Author: du Toit, Derick, Published by: Desert Research Foundation of Namibia Minister of Education and Culture, 1995.
9. Environment Diary 2005, Sustainable Living at Work - Source: Jenny Kinnear
10. You Magazine 1702/05
11. Understanding your Past 5 (New Edition) - Oosthuizen, M.S. Appelgryn & J.W. Kew
12. Meadows, M.E : Biography & Ecosystems of South Africa and Environmental Studies series
13. More More More, tell me why: Answers to over 300 questions children ask most often - ARKADY LEOKUM
14. Mocke H.A et al: History Standard 5
15. RNCS Policy Document: Department of Education
16. HISTORY Standard 5, H.A. Mocke H.C. Wallis and N.R. Gunning Via Afrika
17. Science and Discovery: Man's conquest of materials - The International Pictorial Treasury of Knowledge - International Graphic Society - Englewood Cliffs, New Jersey

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TECHNOLOGY

ACTIVITY 1 (CASE STUDY)

ACTIVITY 1.1

SCENARIO

PICTURE OF WILD FIRE AND FIRE FIGHTER EXTINGUISHING THE FIRE



FOCUS: Identification of a problem and other related problems

LEARNER'S ACTIVITY

- ⑥ Work in pairs when doing this activity.
- ⑥ Collect pictures and news articles of wild fires and study them.
- ⑥ Identify the main problem that is being experienced in the picture.
- ⑥ State who are the people affected by this problem.
- ⑥ What else is affected by the problem?
- ⑥ What are the possible causes of the fire?



Equipment used to extinguish fires



FIRE EXTINGUISHERS

When you put a burning splint into carbon dioxide, it goes out immediately. Combustion will not take place in carbon dioxide. This means that carbon dioxide is a good substance to use as a fire extinguisher. Most fire extinguishers contain carbon dioxide gas under pressure. When the trigger is pulled, the carbon dioxide is released. The carbon dioxide is sprayed over the fire. It displaces the air so that no oxygen can get to the fire.



Sand



Water

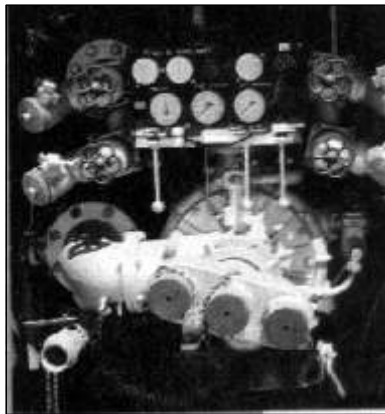




Equipment used to extinguish fires



Fire engines used to fight fires in buildings have ladders so firefighters can rescue people and extinguish flames high up in the building. This ladder is 37m long.



The fire engine was developed in 1725 by Richard Newsham of London. These pictures show the equipment used to pump high volumes of water at great force.



The first hose was invented in 1672 by Dutch inventor Jan van der Heiden. It was made of leather with a copper coupling every 15m. the length of couplings are still standard today.



Firefighting is one of the most dangerous jobs in the world.



OXYGEN CYLINDER
Firefighters try to extinguish the flames in a house in the path of a recent blaze.

ACTIVITY 1.2



FOCUS: Identifying the equipment used to fight fire

LEARNER'S ACTIVITY

- ⑥ Suggest solutions to the problems that have been identified in activity 1.1 above.
- ⑥ List all the fire-fighting equipment used in the pictures you have been given.
- ⑥ What other equipment or methods can you use to extinguish fires?

ACTIVITY 1.3

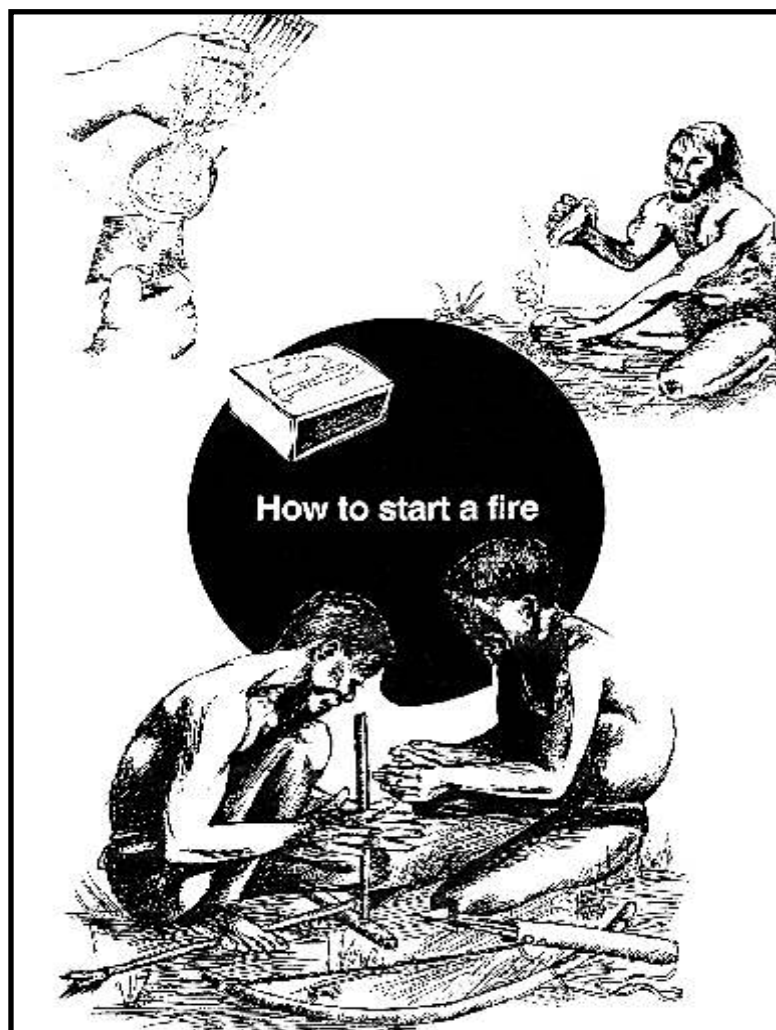


FOCUS: Indigenous technology and culture.

How to make fire, and, in addition, the impact of it.

LEARNER'S ACTIVITY

- ⑥ Ask the elders in your community what methods they used to make fire?
- ⑥ Mention two ways how to start a fire.
- ⑥ What are the positive and negative impacts of fire? (Fire can be our best friend or our worst enemy).



ACTIVITY 1.4



FOCUS: Identifying the type of materials used in fire-fighting equipment

LEARNER'S ACTIVITY

- ⑥ Study the picture on page 1 and identify the materials used to make fire-fighting clothing and equipment pictured there.
- ⑥ Carefully look at the equipment your teacher has brought for this activity.
- ⑥ Name the materials of which each part of the equipment is made.
- ⑥ State possible reasons why such materials are used to protect fire fighters.
- ⑥ List the different protective clothing worn by the fire fighters.
- ⑥ Feel the texture of the costume and the fire beater provided, if possible.
- ⑥ Comment on the texture.
- ⑥ Describe the structure of the fire beater as used in the picture (p.1) and in the EMS section.

ACTIVITY 1.5 (ASSIGNMENT)



FOCUS: Investigating the properties of materials when exposed to fire.

RESOURCES:

COTTON, WOOL, CANDLE, RUBBER OR OTHER MATERIAL AVAILABLE

LEARNER'S ACTIVITY

- ⑥ Work in pairs.
- ⑥ Your teacher will give you a worksheet to complete while you investigate the materials.
- ⑥ Choose the best material you can use to design and make a fire beater.
- ⑥ State two possible reasons for your choice.

ACTIVITY 1.6

- ⑥ Design a safe fire beater that can be used to fight fires in the veld.
- ⑥ The fire beater must have a wooden or steel handle and/or is made of material that will be fireproof and be safe to use when extinguishing fire.
- ⑥ Your fire beater must be strong and flexible to permit unrestricted movement by the fire fighter.



FOCUS: Designing Skills

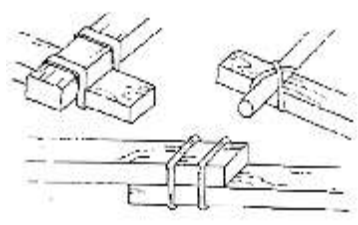
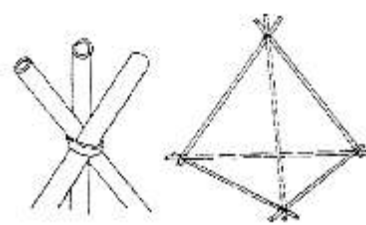
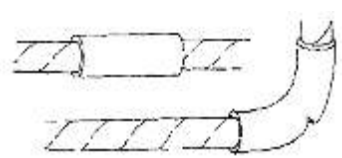
LEARNER'S ACTIVITY

- ⑥ Work in pairs. Do this activity in your exercise book.
- ⑥ Read the scenario given to your group.
- ⑥ Identify the main design aspects of a fire beater: (who it is for, what it is for and what will it look like).
- ⑥ Suggest at least two possible solutions to the design.
- ⑥ Choose one solution and give your reasons.
- ⑥ Develop a written plan for making the fire beater by listing all the main steps needed to complete your fire fighting tool.
- ⑥ Draw simple two-dimensional sketches of each stage of construction.
- ⑥ Be sure to include the measurements of each piece.
- ⑥ List suitable tools and materials to make the product.
- ⑥ Work neatly and clearly with all words spelt correctly.
- ⑥ Use the grid that your teacher will give you.
- ⑥ State what kind of person will not be comfortable using your fire beater.
- ⑥ Will your fire beater make people's lives easier?

Steps in planning a fire beater:

ACTIVITY 1.7 (ASSIGNMENT)

HOW TO JOIN DOWELS OR STICKS

<p>1. You can use elastic bands or thin wire to join dowels or sticks.</p> 	<p>2. You can use elastic bands to hold dowels or sticks in a frame like this.</p> 	<p>3. You can use a small plastic tube to join dowels or sticks. A small cut on the outside of the bend helps to bend the tube.</p> 
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FOCUS: Cutting and joining techniques and use of tools.

RESOURCES: OLD CLOTH, PAPER, WOODEN STICK, STRING

LEARNER'S ACTIVITY

- ⑥ Work in pairs.
- ⑥ Cut a long strip of old cloth and/or use string.
- ⑥ Tie the cloth to the wooden sticks using string to securely keep them together.
- ⑥ Be sure that the tied joint is strong and tight.
- ⑥ Suggest improvements if possible.

ACTIVITY 1.8 (CAPABILITY TASK)



FOCUS: Application of making skills

LEARNER'S ACTIVITY

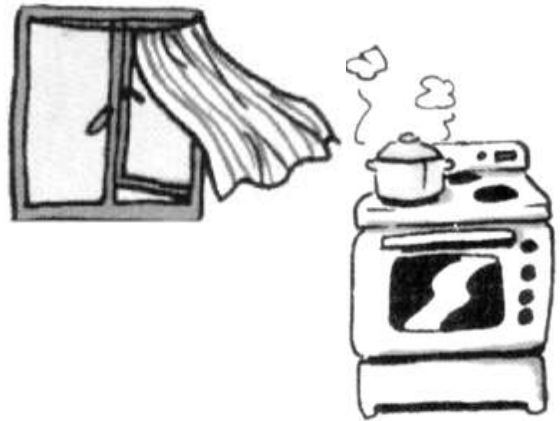
- ⑥ Work in pairs.
- ⑥ Using your written plans begin to construct your fire beater.
- ⑥ Using different colours revise your drawings throughout construction where appropriate.
- ⑥ Evaluate your finished fire beater and suggest improvements.
- ⑥ Make the very best fire beater that you can.



Prevent Fires



Store flammable products such as paraffin out of the reach of children.



Be careful not to let curtains blow onto burning stoves or candles.



Candles must always be placed in a candle holder to prevent them falling over.



Remember to switch off all burners.



It is dangerous to sleep with candles burning.



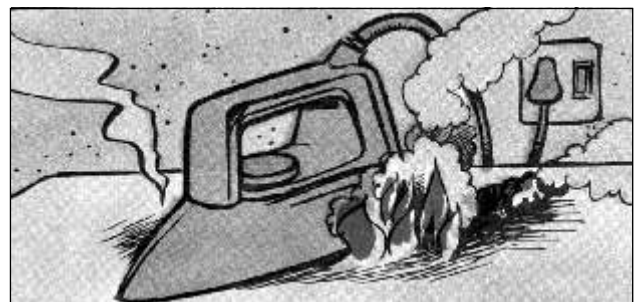
NEVER overload plugs like this. If you need more sockets, call an electrician.



Electrical cords can get hot and cause fires. Do NOT run them under carpets.



Do not overload sockets. Use the correct adaptor.



This can cause a fire. ALWAYS unplug an appliance if it is not being used.

ACTIVITY 2.1



FOCUS: How to prevent fire

LEARNER'S ACTIVITY

- ⑥ Read "What Causes Fires?" and discuss with a friend.
- ⑥ Together identify ways of preventing fires:
 - 1. Wild (veld) fires and
 - 2. Domestic fires
- ⑥ Record your findings on paper or in your workbooks.

WHAT CAUSES FIRES?

Hot, windy and dry weather conditions are perfect for the spread of fires but how do they start?

Fires can be manmade or caused by natural phenomena such as lightning, heat reflection and sparks generated by rock falls. But most fires are caused by careless people who do things such as throwing cigarette butts in dry grass, failing to put out their braai fires properly, failing to check on fires they've made in large drums and so on.

Electrical faults in houses can also cause fires as can glass bottles left in the veld. When the sun strikes the glass at the right angle its rays are concentrated into a small point which can ignite a fire in a dry, grassy area.

ACTIVITY 2.2



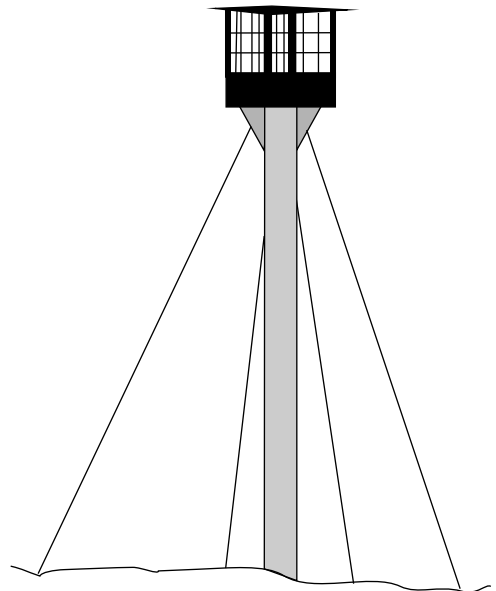
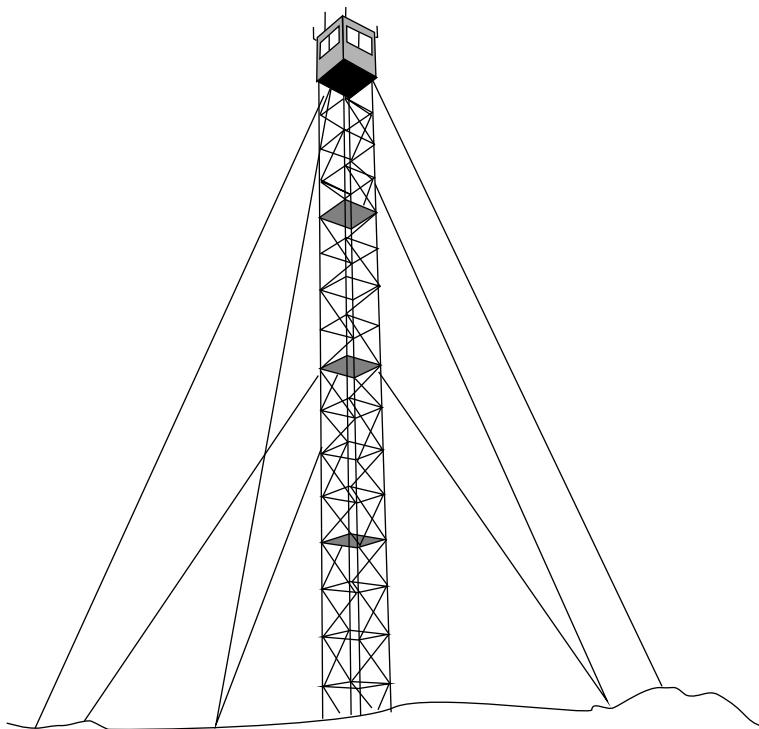
FOCUS: Structure used as look-out towers

LEARNER'S ACTIVITY

- ⑥ Work in pairs.
- ⑥ Study the drawing of the fire look-out tower from where fires can be observed.
- ⑥ Name the shapes that you can see in the picture.
- ⑥ Give reasons why you see many triangular shapes.
- ⑥ Use wooden sticks or to form similar shapes.

RESOURCES:

300mm long wooden sticks, nails, small hammer or meccano with nuts and bolts if available.



ACTIVITY 2.3



FOCUS: Testing structure strength

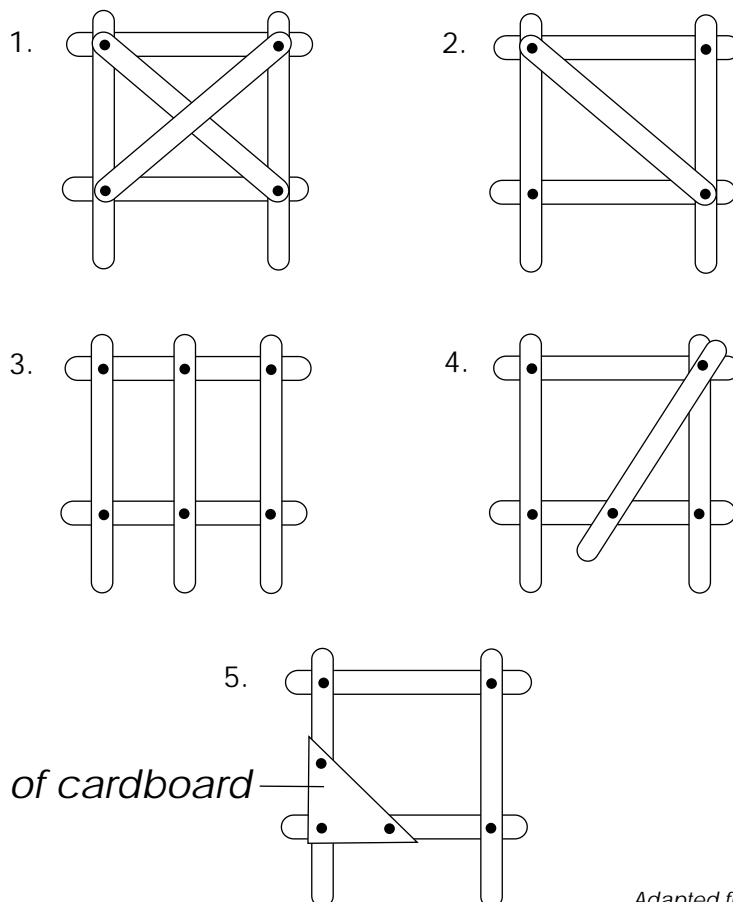
LEARNER'S ACTIVITY

- ⑥ Individual activity.
- ⑥ Take six equal wooden planks .
- ⑥ Join them using a hammer and nails.
 - Join at all end points.
 - Test the strength by moving the one side up and the other down.
 - Observe.
 - Use the other pieces provided, to strengthen the structure to prevent it from moving up and down.
- ⑥ Explain the strengthening process.

If using Meccano:

- ⑥ Join all end points using nuts and bolts.
- ⑥ Test the structure's strength by moving one side up or the other down.
- ⑥ Observe.
- ⑥ Use the other piece provided to assure the structure will not move up and down.
- ⑥ It must be strong.
- ⑥ Explain the strengthening process.

Adapted from: Design and Technology - by James Garratt page 48 - 49

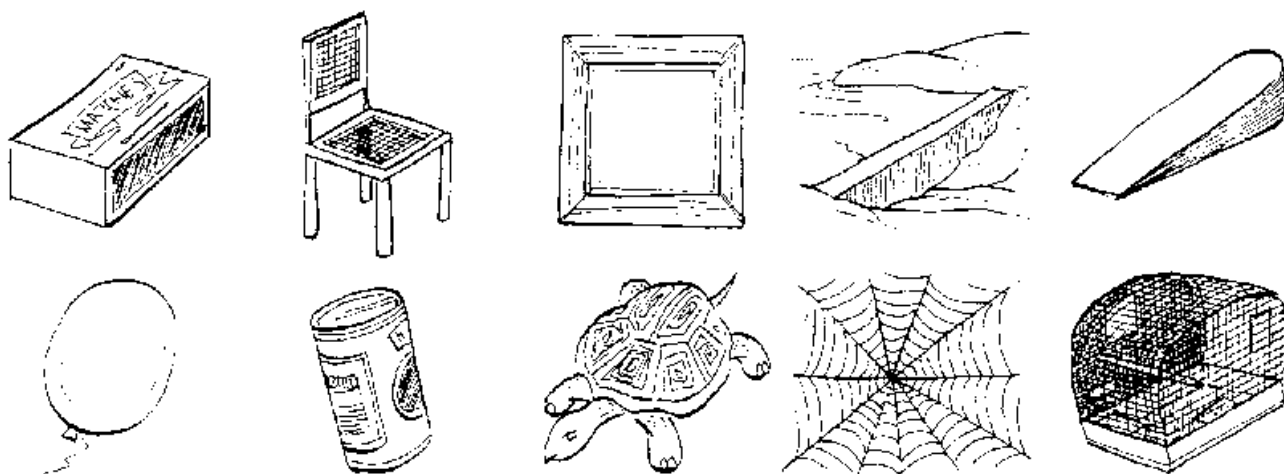


Adapted from: Yebo Technology Grade 5

ACTIVITY 2.4



FOCUS: Type of Structure



LEARNER'S ACTIVITY

- ⑥ Study the pictures at the top of this page.
- ⑥ Now look at the fire fighting equipment with activity 1.2.
- ⑥ Define the function of structure of each of these drawings by sorting them according to their purpose.
- ⑥ Classify the structures in two categories namely the frame and the shell and tabulate them in your work book.

Adapted from: Technology Today Grade 7

ACTIVITY 2.5



FOCUS: Ability to make the structure stable and strong

RESOURCES: 300mm long piece of wood, string or nails, small hammer

1. Identify different ways of how to strengthen the structure.
2. Practice different ways of how to strengthen the structure of the board.
3. Design a board and stand, which will stand on any surface, and be able to stand on its own.
4. Indicate how you have strengthened the stand.
5. State reasons why you decided to use this type of material.

ACTIVITY 3



Scenario

Learners in most schools have experienced the loss of life of family members, friends and community members, loss of property and retrenchment due to fire. There are a number of causes for fire or ways of starting fire, whether for good or bad purpose. One of these reasons is the lack of a fire warning system that will inform people not to play with fire or when it is safe to burn.

You are requested to design a Fire Danger Index (FDI) board that will be used to display the fire index, day and the estimated temperature for the day.

ACTIVITY 3.1



Focus: Ability to choose appropriate material that will suit the condition.

Resources: Cardboard, plastic, paint, brushes, basin, water

1. Investigate the correct material that can be used to make the FDI board or notice board.
2. The material must be able to withstand rain or must be waterproof.
3. It must be easy to decorate.
4. The information should be exhibited in such a way that it could be changed easily to adapt to the conditions.

MATERIAL	Put it in water for about a 30 seconds and record your findings	Apply a one stroke paint on the surface, observe and record your findings
	Does it absorb water?	Is it easy to paint?
PAPER		
METAL		
WOOD		

5. Which material will suit your plan?

ACTIVITY 3.2



Focus: Ability to make the structure stable and strong.

Resources: 300mm long piece of wood, string or nails, small hammer

1. Identify different ways of how to strengthen the structure.
2. Practice different ways of how to strengthen the structure of the board.
3. Design a board and a stand, which will stand on any surface, and be able to stand on its own.
4. Indicate how you have strengthened the stand.
5. State reasons why you decided to use this type of material.

ACTIVITY 3.3



Focus: Ability to make a mechanism to move or rotate in some way.

Resources: wire to make a handle, 1 metre wire, Sellotape, pair of scissors, corrugated cardboard, bottle caps or any coffee bottle caps.

1. The surface of the board must be designed to cater for not less than three indicators i.e. Date, temperature and index colour.
2. Design a mechanism that will be used to change or move date, temperature and index colour.
 - Discuss the type of gears needed to change rotary motion to linear motion.
 - Make those gears using the corrugated cardboard.
3. Evaluate whether your product addresses the need identified.

ACTIVITY 3.4



Focus: The Fire Danger Index

Study the information given on colours and conditions and decide on a colourful and clear way of communicating the environmental conditions related to the fire index.

ACTIVITY 3.5

Draw the different steps you will follow to make the board.

- Plan a working schedule.
 - Who is going to do what?
 - What materials are used?
 - Which tools will be used?
 - Who will do it?
 - How long will it take to do each portion of work?
- Write a project portfolio
- Present your portfolio and product to the rest of the class.

ACTIVITY 4



FOCUS: The Fire Danger Index

Study the information given on colours and conditions and decide on a colourful and clear way of communicating the environmental conditions related to the Fire Index.

ACTIVITY 5



FOCUS: The Fire Danger Index

LEARNER'S ACTIVITY

- ⑥ Draw the different steps you will follow to make the board
- ⑥ Plan a working schedule
 - Who is going to do what?
 - What materials are used?
 - Which tools will be used?
 - Who will do it?
 - How long will it take to do each portion of work?
- ⑥ Write a project portfolio
- ⑥ Present your portfolio and product to the rest of the class

ARTS & CULTURE

ACTIVITY 1

FIRE - FRIEND OR FOE (ENEMY)?

- ⑥ The following activities are designed to raise your awareness to the dangers of uncontrolled fire and how controlled fire can be used in creating the many forms of art.
- ⑥ There are positive uses of fire and there are negative effects of fire.
- ⑥ As your class discusses the aspects write down your ideas in your work books.
- ⑥ As you discuss fire, think about how controlled fire can be used in creating art (making of glass items, burnt wood pictures, batik, pottery, jewellery etc).

ACTIVITY 1.1

RESEARCH TASK ON USES OF FIRE IN CREATION OF ARTWORK

RESEARCH TASK, INTERVIEW RUBRIC. YOUR TEACHER WILL USE THIS RUBRIC TO ASSES ACTIVITY 1.1.

CRITERIA	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
INTERVIEW PREPARATION	The Learner did not prepare any questions before the interview.	Before the interview, the Learner prepared a few lesson suggested questions to ask.	Before the interview, the Learner prepared all lesson suggested questions to ask.	Before the interview, the Learner prepared many in-depth and factual questions in addition to lesson suggested questions to ask.
REPORT WRITING	Learner's report is lacking facts and quotations from the interview.	Learner's report contains some quotations and facts taken from the interview.	Learner's report contains accurate quotations and facts taken from the interview.	Learner's report is well organized and contains accurate quotations and facts taken from the interview.
LEARNER PRESENTATION	Learner is unable to make satisfactory presentation.	Learner's presentation is hand-capped because of minimum preparation but adequate.	Learner's presentation is communicated clearly reflecting understanding of gathered information.	Learner's presentation is comprehensive and exceptional sharing insight gained from collected interviews.



LEARNER'S RESEARCH TASK: INTERVIEWS

Instruction to Learners:

- ⑥ In this activity you will have to compile questions suitable for an interview with elderly people in your community. Decide what it is that you want to know :
- ⑥ Why did they fire their art work?
- ⑥ What did they use their artwork or clay articles for?
- ⑥ How did they fire the articles?
- ⑥ Which methods of firing did they use?
- ⑥ Which fuel did they use?
- ⑥ How did they measure, check and control the temperature inside the kiln?
- ⑥ What were the forms of artwork, the purposes and design features?
- ⑥ Were clay pots used in houses?
- ⑥ What was the origin of pots used in their houses?
- ⑥ Keep in mind that even clay bricks are baked in fire to build a stronger house.
- ⑥ Conduct the investigation.
- ⑥ Record the information you collect.
- ⑥ Interpret the information you collect.
- ⑥ Report your findings in a written form and present it to the rest of the class as an oral presentation.



LEARNER'S CODE OF CONDUCT RULES FOR INTERVIEWS

DO:

1. Introduce yourself and state why you are doing the interview and what you aim to learn from it.
2. Be well prepared. Have your list of questions or topics ready and well prepared that you wish to cover.
3. Keep eye contact with the interviewee.
4. Keep questions short and easy to understand.
5. Be open minded and objective.
6. Be aware of body language and non-verbal signs.
7. Have sufficient paper to write on and record information.
8. Write down as much as possible. Listen and record. Talk little.
9. Interview as many people as possible.
10. Thank the person before leaving.

DON'T:

1. Be aggressive and assume that you have the right to ask questions.
2. Ask more than one question at a time.
3. Give advice. The interviewer is there to learn, not teach.
4. Repeat questions when the interviewee has already answered them.
5. Help an interviewee to give answers.
6. Ask insensitive or very personal questions.
7. Ask too many questions that begin with "Why?"
8. Allow the interview to go on too long (more than 45 minutes).
9. Steer the conversation in the direction that you want it to go.
10. Take poor notes.
11. Interrupt the speaker.

ACTIVITY 1.2

INFORMATION ON THE FIRING PROCESS

Learner's Assessment Form: Open Book Test

- ⑥ You must study this information and then answer the worksheet that follows.
- ⑥ Use the following information on different ways firing can be done to complete the worksheets as an open book test.

1. The Firing of Clay Work

If clay is burned it changes so that it becomes insoluble and will keep its shape when soaked in water. This will only happen if the temperature is high enough. Temperatures of over 900° centigrade are needed to fire Clay Work properly. This is most easily done with an electric or gas burning kiln but few schools will have these and so will have to substitute simpler methods of firing, three of which are discussed here.

In all cases it is important that pottery or models should be made of thoroughly prepared and wedged clay. There should be no cracks visible in the models. The articles should also be perfectly dry before firing.

Leave pots and sculptures to dry slowly and evenly at room temperature.

Firing takes about 24 hours. Somebody should check the fire at regular intervals. You can get free sawdust from any timber yard.

1.1 The Open-Fire Method

1. Dig a shallow pit of about 15 cm deep and large enough to contain the models to be fired.
2. This pit must be in a place well sheltered from the wind.
3. It is best to do the firing on a hot day. Cold weather increases the chance of cracking.
4. Line the pit with sawdust or cow dung.
5. Place the pots and models on the sawdust.
6. Start a fire round the outside of the pit, not close enough to touch the pots with flame.
7. Keep this outer ring of fire small at first to warm the pots.
8. Gradually place twigs nearer and nearer the pots until eventually the fire is burning amongst the articles. Do this very, very gradually and use only light twigs.
9. Scatter a little sawdust or cow dung over the fire, but be careful - too much will put the fire out.
10. Continue adding more and more twigs and cow dung. Now whole branches of light wood can be gently laid on the fire as the heat increases. Try to get a roaring fire going about three hours after the process started.
11. Keep the fire going as long as possible because the temperature should continue to rise. It is possible to make an open fire, like this, hot enough to melt glass.
12. Do not use heavy wood, the articles will be broken. Long thin wood is best because it becomes difficult to approach the fire. Cow dung makes a slow steady heat.
13. Allow the fire to die down slowly. Leave the articles untouched until the ash is cool.



Open firing in a shallow pit, showing how to lay the firewood before lighting the fire.

1.2 Making a kiln in an embankment

This is quite an efficient firing method:

- a) Choose an embankment or steep sloping patch of ground which faces in the direction of the prevailing wind.
- b) In this embankment, dig a hole with a narrow entrance which widens out into a circular hole about one metre wide and one metre deep. The entrance to this hole must enable one to reach into the hole and almost touch the other side.
- c) Make a chimney out of some zinc or asbestos piping, (the same type that roof gutters and down pipes are made of). Place the chimney at the back of the hole, and support it with metal rods on the upper part.
- d) Cover the hole with a piece of scrap metal, such as an old car door or bonnet. Cover this with soil/earth. Protect the hole from people or animals that may walk over it.
- e) Make a fire in the hole to dry it out.
- f) Clear out the ash and lay some sticks of damp fire-wood at the back.
- g) Make a table of bricks or kiln shelving inside the hole. Place more damp wood under this.
- h) Stand articles to be fired on the brick-table. The articles may touch each other and small pots may be placed inside large ones.
- i) Place some dry wood and kindling near the entrance.
- j) Wall up the entrance with bricks plastered with coarse clay.
- k) Remove the bottom two bricks, leaving half-bricks to support the closed entrance. Air will pass through the hole made by removing the bricks and wood can be inserted through the same hole.
- l) Light the fire near the entrance. It should start slowly because the wood at the back will not catch fire at first because it is wet.
- m) If the fire burns too quickly, slow it down by partly covering the hole of the entrance.
- n) If the firing is done on a day when the wind is blowing towards the entrance of the kiln, then a good blaze will be made inside the kiln. Wood must be constantly added through the hole in the entrance.
- o) Continue adding wood all day, and allow pupils to take turns as the job is very tiring.
- p) Some coarse clay must be available to re-plaster the entrance as the clay dries.
- q) Cow dung may also be used as fuel.
- r) Allow the fire to die down slowly. Do not open the kiln until the middle of the following day when the sun is hot. Do not remove the articles if they are still hot.

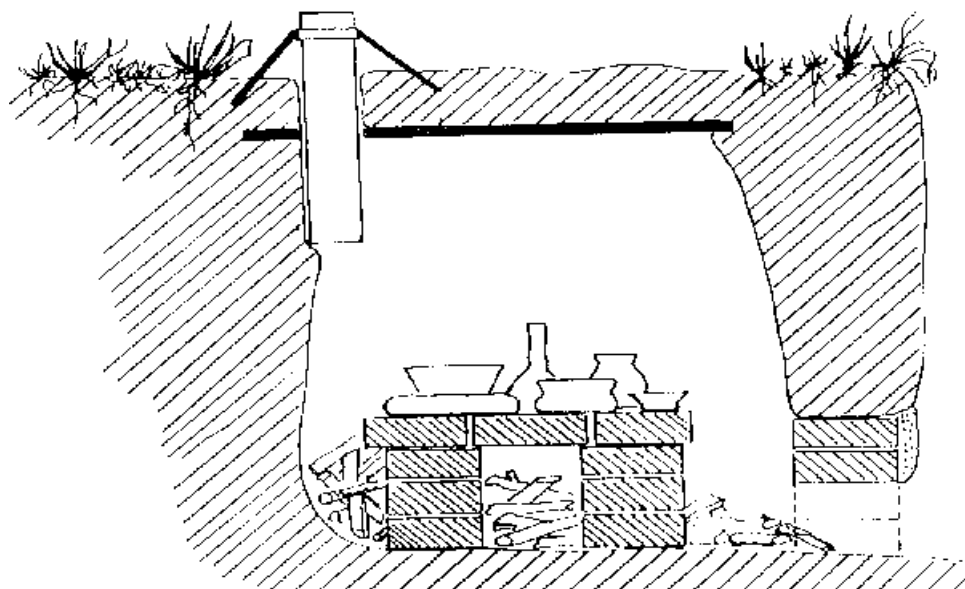
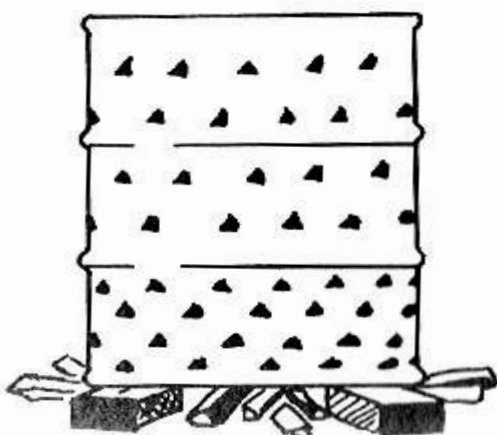


Diagram of a cross-section of a kiln dug into an embankment.

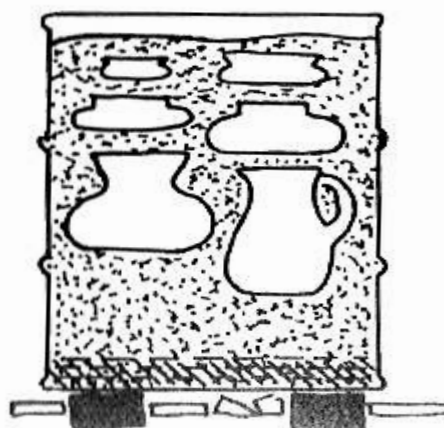
1.3 An Oil-Drum Kiln

A few articles can be fired at the same time in the following manner:

- a) Punch fairly large holes in the bottom and sides of an empty oil-drum.
- b) Place the drum on a stand of three bricks to allow as much air as possible to reach the bottom. Do this in an open place.
- c) Make a layer of a few centimeters of sawdust or dry cow dung. Sprinkle some paraffin over this bottom layer so that it will catch alight easily.
- d) Add a little more fuel (sawdust or cow dung).
- e) Place the articles on this adding more sawdust continually and filling pots with it.
- f) Place large articles below the small ones.
- g) Place a loose lid on top of the drum.
- h) Light the fuel at the bottom.
- i) Leave the sawdust or cow dung to burn for as long as requires. This should be about three days as sawdust or cow dung burn with a slow steady heat.
- j) This method of firing does not produce very high temperatures, so that the fired clay will be rather soft.



Oil drum kiln, exterior view showing holes pierced in the drum.



Oil drum kiln, section showing pots in sawdust, with paraffin at the bottom

Firing clay pots is an important means of making pots hard and durable. Find out about the different temperatures and ways of firing clay pots from someone in your community.



WORKSHEET SECTION A - MULTIPLE-CHOICE QUESTIONS

Write the correct answer out of a), b), c) or d) next to the correct number in your work book.

1. *To fire clay-work properly the temperature should be over...*
a). 250° b). 180° c). 900° d). 575°
2. *Firing of clay items take at least ...*
a). 14 hours b). 24 hours c). 12 hours d). 2 days
3. *It is best to do firing of clay items on a ...*
a). cool day b). moderate day c). cold day d). hot day
4. *If you use the open-fire method, you should...*
a). build a roaring fire from the start.
b). gradually build the fire into a roaring fire in about three hours after you started the process.
c). use thick heavy wood to raise the temperature quickly to 900°.
d). cool down the fire quickly with water.
5. *The entrance hole of a kiln in an embankment should face...*
a). in the direction of the prevailing wind.
b). away from the breeze.
c). North.
d). Upwards.
6. *If the fire catches too quickly in an embankment kiln, slow it down by...*
a). splashing on some water
b). pulling out some of the wood
c). partly covering the entrance hole
d). covering the entrance hole of the kiln.
7. *The oil drum method...*
a). produces very high temperatures.
b). doesn't produce very high temperatures.
c). produces very low temperatures.
d). produces very hard and durable clay-work.



WORKSHEET SECTION B -TRUE OR FALSE QUESTIONS

Study the following statements and decide if they are TRUE or FALSE.

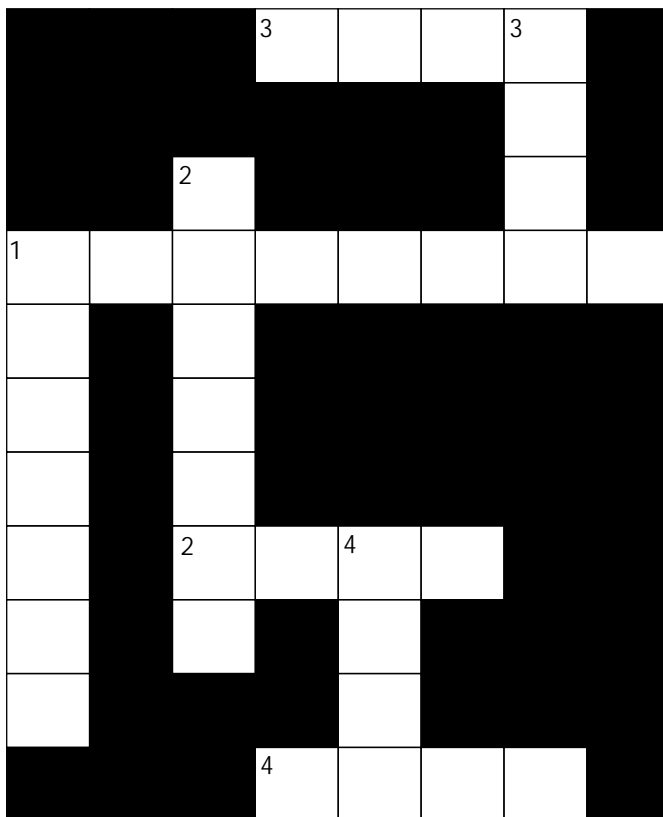
Write T (true) or F (false) next to the number of the sentence in your workbook.

1. Fired clay will not keep its shape if it is soaked in water.
2. Articles should be perfectly dry before firing.
3. Leave pots and sculptures in the sun to dry quickly before firing.
4. In the open-fire method the fire should not touch the clay items with flame when you start the fire.
5. Cow dung creates a quick very hot fire.
6. After making a kiln in an embankment you should make a fire in the hole to dry it out.
7. The fire should be allowed to die down slowly.
8. The oil-drum kiln produces the hardest clay work of the three methods.



WORKSHEET SECTION C - CROSSWORD PUZZLE

Your teacher will give you a copy of this puzzle that you can stick into your workbook.



Fill in the following crossword puzzle to complete the sentences.

CLUES ACROSS:

1. If you fire pots on a cold day, you increase the chance of _____.
2. The oil-drum firing method produced rather _____ clay work.
3. You can dig a hole in a _____ or a steep sloping patch of ground to make a kiln.
4. In the oil-drum method the sawdust or cow dung burn with a _____ steady heat.

CLUES DOWN:

1. A kiln in an embankment will need a _____ which could be made with zinc or asbestos piping.
2. In the open-fire method you can line the pit with _____ or cow dung.
3. A _____ is a electrical or gas oven used to fire clay items.
4. Sawdust or cow dung could be used as _____ in all three methods of firing.



Choose the method of firing clay that you think will be the most suitable to use in your school. Make drawings of the steps that should be followed to prepare the firing method you chose. Do this in a cartoon strip way. Draw at least 6 steps. Make it colourful. Draw 6 blocks in your workbook like in the example below.

1	2	3
4	5	6

ACTIVITY 2.1

MAKE ART PRODUCTS USING DIFFERENT ART FORMS / MEDIA / METHODS

Instructions To Learners:

- ⑥ You will work together in groups to create a visual product that artistically sends a message about the danger of wild fires.
- ⑥ Remember this is a joint decision making activity.
- ⑥ Your group will be assessed on your group's ability to work cooperatively together planning a mask, craft, artifact, costume, collage or puppets using natural, waste or found materials.
- ⑥ Your product must demonstrate environmental concerns.
- ⑥ Be sure to keep safety issues in mind.
- ⑥ Pay close attention to maintaining cultural diversity.
- ⑥ You will also be asked to make a class presentation explaining your project.
- ⑥ Study or recall all the information on preventing veld fires, surviving a veld fire, safety rules about fire, stop, drop and roll, and all information you got in other learning areas about fire.
- ⑥ Use this information and the impact it made on you, to create a group art product.
- ⑥ Take three or four double pages of thick newspaper to make a firm base for your product
- ⑥ On this paper you can use collage, painting, drawing or any other method to bring home the message: *Fire: Best friend or worst enemy*.
- ⑥ Choose any suitable material or design to express your interpretation of the topic.
- ⑥ Your product must have a frame consisting of a border of patterns, shapes or designs.
- ⑥ Must visualize the information.
- ⑥ Must be colourful and clear.
- ⑥ Must bring out a clear message about fire.
- ⑥ Must reflect your feelings, emotions about fire.
- ⑥ Your work will be assessed using the following rubric:



CRITERIA	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
COLLABORATING AND PLANNING GROUP PROJECT	Educator intervention required to keep Group on task. Poor use of waste materials and environmental concerns.	Some Educator assistance. Most environmental issues addressed correctly. Some negotiation demonstrate.	Group interaction and collaboration satisfactory. Balanced sharing of Ideas, resources and waste materials.	Group demonstrated thoughtful, cooperative, thorough and insightful planning. Creative use of waste materials.
PRESENTATION ORGANIZATION AND SUBJECT KNOWLEDGE	Audience cannot understand presentation because there is no sequence of information. Student does not have grasp of information; student cannot answer questions about subject.	Audience has difficulty following presentation because student jumps around. Student is uncomfortable with information and is able to answer only rudimentary questions.	Student presents information in logical sequence which audience can follow. Student is at ease with expected answers to all questions, but fails to elaborate.	Student presents information in logical, interesting sequence which audience can follow. Student demonstrates full knowledge (more than required) by answering all class questions with explanations and elaboration.

ACTIVITY 2.2

OBSERVATION, INTERPRETATION AND PERFORMANCE

Instructions to Learners:

- ⑥ The work done by all groups in Activity 2.1 will be exhibited.
- ⑥ Interpret the art product of other groups of Learners.
- ⑥ As a class discuss the properties and interpretation of the work of art.
- ⑥ Use the following questions as exemplars. (Taken from assessment guideline for senior phase)
- ⑥ What is the title of the work?
- ⑥ What do you understand by the title of this work?
- ⑥ How do you feel about the expression of this art work with reference to cultural or environmental context?
- ⑥ Name the medium used to create the artwork with reference to specific art form.
- ⑥ List all the elements of design reflected in this work of art.
- ⑥ Discuss the application of any two of the above identified elements.
- ⑥ Compare each group's presentation against the criteria established in the Activity.
- ⑥ Are the creations colourful and clear?
- ⑥ Do the creations deliver a clear message about fire and reflect their feelings and emotions about fire.
- ⑥ This is to be an open class discussion.



CRITERIA	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
INTERPRETATION	Learner is able to partially express own understanding of art works.	Learner is able to express own understanding of art works.	Learner is able to logically express own understanding of art works.	Learner is able to logically and effectively express own understanding of art works.
IDENTIFICATION	Learner is able to identify one art element applied in art work.	Learner is able to identify two art elements applied in art work.	Learner is able to identify three art elements applied in art work.	Learner is able to identify all the elements applied in art work.
CRITICAL THINKING	Learner is able to partially reflect on and engaged with a work of art.	Learner is able to reflect on and engaged with a work of art.	Learner is able to reflect critically and engaged satisfactory with a work of art.	Learner is able to reflect critically and engaged effectively with a work of art.

ACTIVITY 3 - DRAMA

ASSESSMENT CRITERIA GROUP: _____	4 EXCELLENT	3 GOOD	2 ACHIEVED	2 NOT ACHIEVED
Focus				
Tension				
Contrast				
Symbolism				
Movement – Communicate meaning and feeling through dance, body language, facial expression, etc.				
Use of Voice – Communicate meaning and feeling with voice articulation, expression, projection, etc.				
Characterization – Using observation, imitation and imagination.				
Sound effects – Music, birds singing, rain falling, etc.				
Props and Costumes				
Group co-ordination positions				
Portfolio presentation: sketches of for example the floor plan, décor, props, costumes, make-up. Notes on sound effects, and incorporation of movement.				

Instructions to Learners:

- ⑥ Read "How People Learned To Cook" from "Playing With Fire . . . , Energy and the Namibian Environment, by Derick du Toit and Teresa Sguazzin, 1995, Desert Research Foundation of Namibia, Ministry of Education and Culture, page 27.
- ⑥ Determine the different characters that occur in this story.
- ⑥ Determine the plot.
- ⑥ Determine the key moments in the story.
- ⑥ Discuss how to perform this story as a drama, using masks to portray characters.
- ⑥ You may also make puppets and change the story into a puppet show.
- ⑥ Music could be added.



This is one of the most commonly told Bushman stories about how people discovered fire and its uses.

In the time when animals were people, only Ostrich knew the secret of fire. Because he didn't want anyone else to know his secret, he carried it hidden under his big wing and took it wherever he went.

One day Ostrich, who was out in the bush gathering food, had just prepared a meal on his secret fire when Bushman arrived, tired and hungry. Ostrich could see that the man was very hungry, so he offered to share his food with him. So it happened that for the first time Bushman ate cooked food and he found it very delicious. He ate and ate until his stomach was round and full, then he thanked Ostrich and returned home.

When he reached his family he found them sitting in the dark, eating their evening meal of raw berries and tubers. Bushman told them of the wonderful meal he had eaten with Ostrich, and described the warm fire with its leaping flames and glowing embers. His wife became very angry with him. "Why do you only tell us of these things? You should have got Ostrich's secret from him, then we could all eat delicious food!"

Bushman sat up late into the night, thinking about how to get hold of fire. The next morning he called his family to him and they all set off for the bush. They worked hard all day and collected a feast of tsamma melons, berries, fruits, bulbs and roots. Then bushman said to Ostrich, "Now it is time to dance."

Then Bushman's wife began singing, clapping her hands and dancing. Soon everyone was dancing, but Ostrich, because of his secret, danced with his wings held close to his body. He did not want anyone to see or steal his secret fire.

Bushman began dancing wilder and wilder. He waved his arms and held them high in the air. "Ostrich, Ostrich," he shouted above the noise of the singing, "that is no way to impress the women. You must dance with your arms in the air like this!"

For a moment Ostrich forgot all about the fire he was carrying. He lifted his wings high in the air. Bushman, seeing the fire, ran forward and snatched it. He ran with it into the forest, knowing that Ostrich did not like to go into woody areas.

So the secret of fire was a secret no longer, and from that day forth all people have been eating deliciously cooked food.

Adapted from: Living legends of a dying culture, Coral Fourie, 1994.

ACTIVITY 4

EXPRESSING AND COMMUNICATING RESOURCE MATERIALS

ASSESSMENT RUBRIC ACTIVITY 4

CRITERIA	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
GROUP PARTICIPATION	Group members did the assignment but did not appear very interested. Focus was lost on several occasions.	Group used time pretty well. Stayed focused on the assignment most of the time.	Group used time well and focused attention on the assignment.	The group creation is well organized and contains accurate information and facts taken from the resource materials.
PRESENTATION	Group presentation needs more practice, planning and lacks relevant information.	Group presentation covered most relevant information and is well organized.	Group presentation covered all relevant information and used music well to communicate safety issues.	Group presentation was creative, colourful and musical including all relevant facts of safety, held audience

Instructions to learners:

- ⑥ In this learning program on fire we have looked at fire from many different angles from all learning areas.
- ⑥ You will gather a lot of information about fire on which you can base your Arts and Culture activity.
- ⑥ Read through the information and try to experience the threat that a wild veld fire or shack fire can have on people and their possessions. Try to imagine yourself being caught in such a fire, or your clothes are burning. Recall what you should do under these circumstances.
- ⑥ You must then write a song about a wild fire and what you have to do to escape from the danger.
- ⑥ This song must then be presented in a portfolio, which you can illustrate like you wish.
- ⑥ You can add music created by any improvised musical instrument to strengthen the mood or feelings you want to emphasize.
- ⑥ Use the rhythm to work out body movements to accompany the music and singing.
- ⑥ You can then perform your song to the rest of the class.

Tips for creating your song:

- ⑥ Decide what you want to say about the topic.
- ⑥ Decide on the emotions, feelings or mood you want to create.
- ⑥ Experiment with different beats and find one that suits your theme.
- ⑥ Try some words or phrases with your beat.
- ⑥ Write your words in fairly regular lines or verses- they don't have to rhyme.
- ⑥ Sing your first words over and over again to yourself until you find a tune that goes with them.
- ⑥ Make sure that some of your words and some of the tune are repeated.
- ⑥ Decide if you want a chorus:
- ⑥ A chorus is usually a repeated part or passage that is simple and carries the main message of the song (e.g. *STOP, DROP AND ROLL, CRAWL, LOW, LOW, LOW*). It sounds fairly different from the verses.
- ⑥ Your song should have at least two verses, but you can add more if you have more to say.
- ⑥ Decide what kind of accompaniment you want to have with your song.
- ⑥ Practice it until you are happy with it.
- ⑥ Use some of these ideas to create a dance to perform while you sing the song.

(From: Assessment guidelines for Arts & culture senior phase)

To help you, the following information on fire is given:

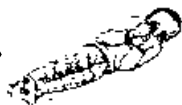
Stop! Drop! Roll! If Your Clothes Catch Fire...



Do not run! This will make it worse



Get down on the floor.



Roll over and over. This will put out the fire.



Crawl low under smoke!

Stay low, and go, go, go!

If you see someone playing with fire, tell them to stop. If you see someone starting a fire, report this to an adult, the police or a responsible person immediately.



WHAT CAN WE DO ABOUT VELD FIRES?

Wild fires can hurt people and animals.

SURVIVING A VELD FIRE

- ⑥ If you are in the veld and you see that a fire has started, MOVE AWAY from the fire immediately, and report it to an adult, a forester, the police or a responsible person in your community immediately.
- ⑥ Never ignore the fire, even if it seems far away - it can quickly become large and engulf you! A grass fire can move much quicker than you can run!!
- ⑥ The most dangerous situation to be in is when the veld fire is moving up a steep slope, and you are above it with bush and grass between you and the fire.
- ⑥ If you feel threatened and you don't think you can outrun the fire, or if you are surrounded, then find a 'Safe Zone'.
- ⑥ A 'Safe Zone' can be an area that has already been burnt, or is completely clear of any fuel that can burn, such as a wide road or an old homestead. The clear area should be as large as possible.
- ⑥ DON'T PANIC and run only at the last minute.
- ⑥ Remember that what will hurt you is the heat that the fire makes, and the lack of oxygen to breathe.
- ⑥ Lie down on the ground, cover your head, breathe deeply before the smoke gets too close. Hold your breath when the fire passes over and around you. If you have blankets or extra clothing with you, try to cover any exposed parts of your body.

It is always best NOT to get into this situation, and MOVING AWAY from the fire is always the best option.

PREVENTING VELD FIRES

- ⑥ 90% of uncontrolled fires are started by people being careless.
- ⑥ All fires start small. But when the weather is hot, dry and windy a small fire can quickly become a threat to life and property.
- ⑥ It is against the law to start a veld fire in the fire season without permission. Permission can be given by the local Fire Protection Association, the landowner, local authority or community leaders.
- ⑥ Before starting a fire for firing clay work, make sure that the fire cannot spread by:
- ⑥ Only lighting a fire when there is no wind and the weather is cool - listen to the radio and TV for the fire danger warnings.
- ⑥ Working outside the classroom.
- ⑥ Preparing the area outside where you are firing the pots.
- ⑥ Being prepared by having beaters, sacks and green branches and water close by, to keep the fire under control.
- ⑥ Veld fires often start close to the home, and can cause injuries, death and loss of personal belongings.

TO PREVENT THESE FIRES:

- DO Get rid of hot ash and coal from heating and cooking in a safe place where there is no plant material that can catch alight.
- DO Cover an open fire with sand to smother it.
- DO Always work in an open, cleared area when working with power tools. Power tools like angle grinders, welders and chainsaws make sparks which can ignite the surrounding veld.
- DO Make sure that there are no illegal electrical connections connected or near your home

and that electrical appliances are correctly wired. Illegal and faulty electrical connections can get hot and start to burn.

DO Keep the area around your home clear of material that can burn, such as firewood, kindling and garbage.

DON'T Burn garbage on a hot and windy day, as the fire can easily spread and cause a wildfire.

DON'T Play with matches!

DON'T Throw away burning cigarette ends!

DON'T Leave an open fire unattended!

FIRE CAN BE BENEFICIAL

⑥ In most cases fire causes a lot of damage, destroying houses and property, and threatens people's lives. Many small animals also die in veld fires.

⑥ But in spite of their destructive potential smaller veld fires sometimes have a positive effect on the environment. Veld and forest fires are a natural part of our ecosystem. Some plant and tree species are dependent on veld fires. Many plant species such as the fynbos species in the Western Cape have adapted so well to fire that they depend on periodic (and preferably controlled) fire for their survival and renewal. Some species grow back stronger after a veld fire and therefore get a new lease on life after a controlled veld fire.

Note: A controlled fire or burn is a fire that is made by a responsible person, because he needs to burn a certain part of the veld. And this is only done when the weather conditions are safe.

ACTIVITY 5

CREATING, INTERPRETING AND PRESENTING - EXPRESSING AND COMMUNICATING
YOUR TEACHER WILL USE THIS RUBRIC TO ASSESS YOUR LOGO.

CRITERIA	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
DESIGNED A LOGO/EMBLEM	Designed a logo/emblem.	Designed a logo/emblem attempting to use fire as a symbol.	Designed a logo/emblem which represents fire as a symbol.	Designed an excellent logo which represents fire as a symbol in a very creative way.
CREATED A BADGE OR BUMPER STICKER USING DESIGNED LOGO/EMBLEM	Attempted to create a badge or bumper sticker. No evidence of original thought.	Tried to use the design elements: line, shape to compose badge or bumper sticker.	Used the design elements of logo/emblem as well as line and shape to create a successful badge or bumper sticker.	Used more than the design elements and the designed logo/emblem in a creative way to compose a very successful and attractive badge or bumper sticker.

Instructions To Learners:

- ⑥ The symbol of fire or the sun is featured on flags of some countries.
- ⑥ In this Activity you will identify flags, symbols, coats of arms and Logos where fire or the sun is used.
- ⑥ Do research in your library about flags and other Logos.
- ⑥ The Coat of Arms of South Africa is an example of a logo/emblem.
- ⑥ Discuss the meaning Logos, symbols and emblems like these.



THE COAT OF ARMS OF SOUTH AFRICA

Now design your own Logo of fire or flames:

- ⑥ Listen to your teacher when he/she explains how to use line and shape when designing your Logo.
- ⑥ Use your Logo to make a badge to communicate any message concerning the correct use of fire, prevention of fire, etc.
- ⑥ Cut a piece of cardboard as large as the Logo, stick the drawing onto the cardboard and add colour.
- ⑥ Paint some wood glue over the design to seal it. Stick a safety pin onto the back of the badge with glue or some tape. Wear it to spread your message. OR
- ⑥ Follow the same instructions for the badge but, instead, design a bumper sticker using your Logo.
- ⑥ Be sure to include written words on your bumper sticker to communicate a fire-preventing message.
- ⑥ Glue your bumper sticker to adhesive paper.

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duToit, Derick and Sguazzin, Terest, "Tools of the Trade: Skills and techniques for Environmental Education in Namibia", Desert Research Foundation of Namibia, Ministry of Education and Culture, 1995, pp. 98, 102-103

ACTIVITY 1

WHAT LEARNERS KNOW ABOUT FIRE

- Listen carefully as your teacher reads this poem to you

FIRE, FRIEND OR ENEMY

Like the sun I have always been there.
I warmed your ancestor's cave,
I cooked his food,
I served him the way I serve you today.

BUT

I am not always friendly.
If you leave me unattended, I create disasters
I burn down your houses,
I kill your livestock, and I burn your veld and forests.
I reduce your possessions to worthless ash.
Disrespect me and mankind suffers.
I can burn a hole in the ozone layer, deplete your oxygen supply and
bring your planet to extinction.

I AM FIRE
I can be your best friend
Or
your worst enemy!

The choice is yours.

- Discuss fire with your teacher and classmates.
- Make a list of all the words in the poem that you do not understand and look up their meaning in your dictionary.
EXAMPLE:

Word:	Meaning:

ACTIVITY 2

FIRE, FRIEND OR FOE (ENEMY) ?

- Listen carefully to the short paragraphs your teacher is going to read to you.
- After each paragraph the teacher will ask you a question to find out how well you have listened.
- Write down the answers in your classwork books next to the correct numbers.

A. Answer the following questions:

1. How can fire be a good friend?

2. What is another name for an uncontrolled fire?

3. Look up one of the following words and explain what it means:

Natural: _____

Phenomenon: _____

B. Most fires are caused by careless behaviour:	True	False
1 - People must not put out their cigarettes before throwing them away.		
2 - People should not leave cooking fires unattended.		
3 - People should not leave warming fires unattended.		
4 - It is good to put a burning paraffin stove on a table where a child can reach it and pull it off.		
5 - It is good to clear the veld around your home because if there is a veld fire, your home will be safe.		
6 - Farmers can burn the veld to improve grazing for their livestock during any weather conditions.		
7 - People leave litter in the veld, and this may cause veld fires. If glass bottles are thrown onto the dry grass, the rays of the hot sun on the glass may start a fire.		
8 - Electrical faults in homes may cause fire.		

C. HELP PREVENT UNWANTED FIRE

1. Remember: All fires start small, and it is easier to put out a small fire, than a big one. Have you ever put out a fire? Yes _____ or No _____
2. If you see a small fire, immediately put it out, or call someone to do so. Who will you call? _____
3. There are different types of fire, and they are put out in different ways. Ask your teacher to explain the difference between an electrical fire and a veld fire.
4. Why should you pick up glass in the veld? _____

5. Do not leave any fire or candle burning when you go to sleep. What should you do with it?

6. Should you make fires where there are signs telling you not to make fires?

Yes _____ or No _____

7. Why should children not play with fireworks?

ACTIVITY 3

WORDS DEALING WITH FIRE

3.1 WORD FIND

- On a copy of this word puzzle, find the words listed below the puzzle and circle them on the puzzle.
- The first word *DANGER* has been done for you.

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

FIND THESE WORDS IN THE PUZZLE ABOVE

DANGER
CIGARETTE
PLANTATION
AIR PRESSURE
EROSION
FLAME
SPARK
CONSUME

MATCHES
FLAMMABLE
BURN
WIND
FIRE
HUMIDITY
EXTINGUISH
TEMPERATURE

ACTIVITY 3.2



Match the words with their definitions

ASK YOUR TEACHER FOR A COPY OF THIS WORKSHEET AND PASTE IT IN YOUR WORK BOOK.
LINK THE WORD WITH THE CORRECT DEFINITION BY WRITING THE NUMBER OF THE WORD IN THE SPACE NEXT TO THE CORRECT DEFINITION

WORD	DEFINITION
1. DANGER	___ An estate where tobacco, oranges or cotton is grown
2. MATCHES	___ Combustion: Heat, air and fuel create light and heat
3. CIGARETTE	___ Finely cut tobacco rolled into a thin cylinder.
4. PLANTATION	___ Able to be burned.
5. BURN	___ The amount of moisture (water) in the air.
6. FLAMMABLE	___ Cause a fire to go out.
7. EROSION	___ The amount of heat in a body in relation to others.
8. FIRE	___ A time or place that can cause harm.
9. AIR PRESSURE	___ Set fire to, or cause to burn.
10. SPARK	___ Air moving rapidly.
11. EXTINGUISH	___ The wearing away of earth's surface by water or wind.
12. FLAME	___ Short thin piece of wood tipped with something that ignites when scratched.
13. IGNITE	___ To completely reduce to nothing, or destroy.
14. TEMPERATURE	___ Destroyed by fire.
15. CONSUME	___ Ignited gas that makes light and heat.
16. HUMIDITY	___ A fiery particle thrown off from a fire.
17. WIND	___ Air pushed inside or against an object with force.

ACTIVITY 4

ACTIVITY 4.1

STUDY THE INFORMATION ABOUT FIRE ON THE FOLLOWING PAGES AND THEN COMPLETE THE TASK YOUR TEACHER WILL GIVE YOU.

GROUP ACTIVITY - ASSESSMENT RUBRIC

	Level 4 7 – 8	Level 3 4 – 6	Level 2 3	Level 1 2 – 1
Selection of information	Able to select the most appropriate information. Excellent examples used	Able to select sufficient appropriate information. Good examples used	Selected some appropriate information. Examples used	Examples either not present or irrelevant

This Rubric will be used to assess your work in groups.

	4 very well	3 well	2 not so well	1 needs practice
Listens to others				
Encourages others				
Keeps to the task				
Makes good suggestions				
Asks questions				
Follows instructions				
Uses time and resources constructively				
Accepts constructive criticism				



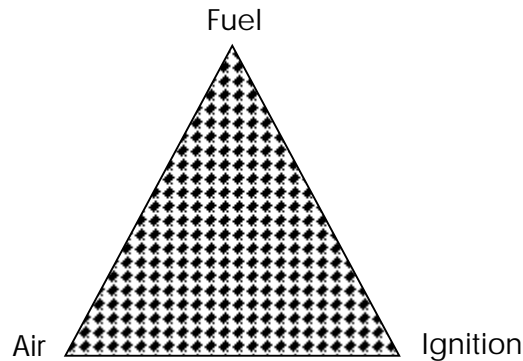
WHAT IS FIRE?

1. "Fire" is a process by which something is burned.

Fire destroys the components of any substance or changes its characteristics.

- a) Fire involves extreme heat and usually flames and smoke are present during burning.
- b) Fire can start naturally through intense heat causing combustion to occur.
- c) This can also occur when lightning strikes a tree.
- d) Fire can start when people are careless and drop hot ashes, or burning matches or cigarettes in the veld.
- e) A small fire can quickly spread and become a big fire if it has not been carefully and completely extinguished.
- f) Fire spreads very rapidly. Especially when the material that is burning is very dry, or is particularly flammable, i.e. certain weeds, wood and grass.
- g) Fire can become worse if there is wind, because the wind will blow the fire and the fire will spread from one place to another. It then becomes very difficult, or impossible to control.
- h) Fire can also be worsened if the air is very dry or warm winds are blowing.

What is needed for fire to burn?



2. Fire can be our BEST friend, or our worst enemy

Some of the advantages of fire are:

- a) Fire provides heat for warming and cooking.
- b) Many plants in nature rely on fire, to stimulate growth such as grazing for cattle.
- c) Fire can provide light to people who do not have electricity (candles).
- d) Fire can be used to prepare the land for seeding and planting.
- e) We use fire to burn fire breaks. This helps to prevent uncontrolled fire from destroying our property.

3. Why uncontrolled fire is bad (the negative impacts):

a) *Social impact*

Fire can cause:

- Loss of life
- Injury e.g. severe burns
- Loss of property e.g. house burns down
- Loss of employment: Many people depend on forestry for their jobs. If a fire destroys the plantation, there is no work for the people and the people have no money to buy food, medicine or clothing.

b) *Economical Impact*

- Many people in Mpumalanga rely on their income from natural raw products such as forestry and fauna and flora. If these raw products are destroyed, there are no raw products to supply the markets. Examples of the raw products are: crops and plantations.
- Fire can destroy buildings and equipment. This is very expensive to replace and if it is destroyed by a fire, the person may be forced to close his business.
- This may lead to unemployment, and all the problems related to that.

Raw product + Harvest raw product + Process raw product + Sell end product

↓
Job opportunities
(Income)

↓
Job opportunities (Income)
Supply needs (Furniture)
(Income)

- c) Environmental impact
- Can cause air pollution and can contribute to global warming.
 - Can destroy sensitive ecosystems such as wetlands and disturb bio-diversity.
 - Can destroy grazing.
 - A very hot fire can destroy the soil structure and nutrients.
 - This destruction can cause soil erosion because the plants that are holding the soil, will be destroyed.

The time it takes for natural plant life to recover from an uncontrolled (or unwanted) fire differs. The effect of uncontrolled fire on our environment is often devastating.

Imagine if your house burns down!

- You will lose all your clothes.
- All your furniture will be destroyed.
- You would have to start right from the beginning to build a new house. This could take many months to do and it would cost them a lot of money to complete the house. Some families cannot rebuild their homes, because they have no money.

The same thing happens to the plants and the trees. If Sappi's plantation burns down and the trees are destroyed, it can take up to 30 years before the trees have grown and are ready to be harvested.

UNWANTED FIRES THAT ARE STARTED BY CARELESS HUMAN BEHAVIOUR

People are sometimes careless and cause unwanted fires.

Examples of unwanted fire:

- Unattended cooking or warming fires;
- Careless smoking.

FIRE FRIEND OR FOE (ENEMY)?

Fire can cause death and injury - but it is a natural phenomenon and can be good for the environment.

In South Africa - as in many other parts of the world - uncontrolled or runaway fires cause widespread devastation. In 2000, veld fires raged out of control in the Cape Peninsula and Eastern Free State. In 2001 more than 20 houses were destroyed by fire in Gordon's Bay. Last year three people were killed and several injured by a fire in Orange Farm, Gauteng, which damaged 1 500 shacks. Just before Christmas in 2004, 163 people were left homeless when fire swept through the Drommedaris informal settlement in Stellenbosch. The New Year had barely started and Cape Town firefighters already had their hands full fighting veld fires in Muizenberg, District Six and on Signal Hill. Properties were burnt down and hundreds of people forced to flee. On 19 January this year fire swept through Joe Slovo informal settlement in the Western Cape, killing a baby and leaving 12 000 people homeless. Fire not only causes death and injury, but can also cause traffic chaos as vehicles are forced to stop to avoid flames leaping across roads.

It is our responsibility to do everything in our power to prevent uncontrolled (or unwanted) fires and to report any sign of fire as soon as possible. But it's also important to note that fire isn't only destructive. It is a natural phenomenon and can be good for the environment. It may sound strange but in some circumstances, veld fires can help many plant species to survive.



WHAT CAUSES FIRE?

Hot, windy and dry weather conditions are perfect for the spread of fire, but how does fire start?

Fire can be made by people (*manmade*) or can be caused by nature (*natural* phenomena) such as lightning, heat reflection and sparks generated by rock falls. But most fires are caused by careless people who throw burning cigarette butts in dry grass; fail to put out their cooking or braai fires properly; fail to check on heating fires that they've made in large drums and so on.

Electrical faults in houses can also cause fire as can glass bottles left in the veld. When the sun strikes the glass at the right angle, its rays are concentrated into a small point which can ignite a fire in a dry, grassy area.



FIREFIGHTING: THE FIRE BRIGADE OF THE PAST

The history of firefighting goes as far back as *Ancient Egypt*. The ancient Egyptians used hand-operated pumps, a system which unfortunately wasn't very successful.

Firefighting became a serious career for the first time when devastating fires swept through *Ancient Rome*. In 6 AD the Roman emperor announced in desperation that four percent of all state taxes would be used to set up a fire brigade. It was known as *Vigiles* and consisted of seven units, each consisting of 560 men.

At night the streets were patrolled by *Vigiles* members on the lookout for unattended fires. Remember in those days there was no electricity so the city relied on fire for light and warmth. The chances of fire breaking out were therefore great. *Vigiles* used buckets of water and simple pipes to extinguish fires, and there were also a few doctors on duty to see to the injured.

Over the years Rome was struck by many fires, the biggest in 64 AD, a blaze which destroyed two thirds of the city.



HELP PREVENT FIRE

- a) It is better to extinguish a cooking fire, warming fire or any other kind of fire with water than with sand. Make sure that the coals are dead.
- b) Pick up any glass you see lying in the veld. The sun's rays shining through the glass can cause a fire.
- c) Never go to sleep while there's a fire burning nearby. Fires should be watched at all times.
- d) Don't make fire where there are signs prohibiting you from doing so.
- e) Always take special care with fire when the wind is blowing.
- f) Always have adult supervision when playing with fireworks or conducting experiments which could start a fire.



CONTROLLED BURNS (FIRE)

Sometimes farmers need to burn parts of their land by making a fire like when they burn the veld for grazing for their cattle.

- ⑥ This is called controlled burning.
- ⑥ Controlled burning take place under supervision and is only done when the weather conditions are safe.
- ⑥ We measure the weather conditions with the Fire Danger Index.
- ⑥ The Fire Danger Index is also called the FDI.
- ⑥ When the FDI is high, it is dangerous to light a fire.
- ⑥ The FDI is high when it is hot and a warm wind is blowing.
- ⑥ When the FDI is low, it is safe to light a fire.
- ⑥ The FDI is low when it is raining or very wet outside.
- ⑥ Controlled burning means to burn the veld, to get rid of small branches, leaves, dry grass and other plant material.
- ⑥ This will help to prevent uncontrolled veld fires.
- ⑥ Controlled fires have to be planned and managed so they don't become uncontrolled and dangerous fires.

VELD AND FOREST FIRES are a natural part of our ecosystem - some plants depend on them.

Do you and your school know about the Fire and Life Safety Programme?

Towns and cities have fire stations. Many of the fire stations in South Africa are involved with the communities they serve and teach people about fire safety. They'll be able to teach you and your classmates exactly how to avoid fires and what to do when fire breaks out.

On request firefighters will visit your school (in their firefighting outfits!) to present this programme. It's aimed at learners from grade 0 to 7 and is anything but boring.

Among other things you'll learn

- ⑥ Your local emergency number and how to report a fire.
- ⑥ What to do if your clothes catch alight.
- ⑥ How to crawl under clouds of smoke to safety.
- ⑥ How to cool a burn wound.
- ⑥ Safety regarding matches and cigarette lighters.
- ⑥ How smoke alarms can save your life.
- ⑥ What to do if fire breaks out in your home.
- ⑥ How burglar-proofing can trap you during a fire.

People who live on or close to a Sappi plantation can ask the forester to visit their school to teach them about fire prevention. Working on Fire can also assist with this.

FIRE CAN BE BENEFICIAL

Fire can be our friend.

- ⑥ We use fire to cook our food, we make warming fires, we use fire to burn grazing for our cattle etc.
- ⑥ If the weather conditions are right, the veld can burn by itself. Small veld fires can be good for the environment.
- ⑥ Veld and forest fires are a natural part of our ecosystem.
- ⑥ Some plant and tree species are dependent on veld fires. Some plants have adapted so well to fire that they depend on fire (preferably controlled) fires for their survival and renewal. Some species grow back stronger after a controlled veld fire.

ACTIVITY 4.2

- Your teacher will ask you to summarize the findings of Activity 4.1.
- Your group will make one or more contributions to the compiled summary.
- You will then be expected to write your own summary.

RUBRIC

Level 4 7 – 8	Level 3 4 – 6	Level 2 3	Level 1 2 – 1
The learner was able to summarize all the points clearly	The learner was able to summarize most of the points	The learner was able to summarize one or two points	The learner could not summarize any of the points
The learner was able to identify the most appropriate key words in the summary	The learner was able to identify some of the key words in the summary	The learner was able to identify one or two key words in the summary	The learner was unable to identify key words in the summary

ACTIVITY 4.3

- ⑥ Write a poem using information about fire.
- ⑥ Work in pairs if you can.
- ⑥ Write down your ideas.
- ⑥ Use free verse:- i.e. the verses need not rhyme and the length of the lines may vary for emphasis. You must use descriptive language to paint an imaginative picture of the situation.
- ⑥ Be sure to use descriptive words.
- ⑥ Try to use adjectives that have not become overused and worn out and phrase the ideas in fresh original language.
- ⑥ You must please use the information supplied to write a poem.
- ⑥ Use the poem "I am fire" as an example of how to go about this task.
- ⑥ Your poem should include some of the following aspects:
 - * Fire (its causes)
 - * Benefits of fire
 - * The dangers of fire (mention the social, economic and environmental aspects)
 - * The people who deal with fire.

RUBRIC FOR ASSESSING POEM

	4	3	3	1
Content	Used all the information about fire.	Used most of the information.	Used some of the information.	Very little of the information used.
Idea of friend or foe conveyed	Excellent use of descriptive language.	Very well conveyed.	Fairly well conveyed.	Not conveyed.
Originality of language	Excellent use of descriptive language.	Satisfactory use of language.	Fair use of language.	Unexpressive use of language.

ACTIVITY 5

SHACK FIRE HORROR



Utter devastation . . . Ponko Ka Masiba inspects the damage caused by the fire which almost wiped out a whole family in Samora Machel informal settlement.

Pic: Johnson Mesi

ACTIVITY 5.1

- ⑥ Write an individual / group letter to your friend in another town, based on the picture "Shack fire horror".
- ⑥ Imagine that you were one of the people who lived in this shack, in an informal settlement.
- ⑥ Narrate or describe what happened during the fire that destroyed your home.
- ⑥ Describe how and when the fire started.
- ⑥ What was the weather like?
- ⑥ Who else was there?
- ⑥ Tell us what you and the other people did to contain/stop the fire?
- ⑥ What did you smell before, during and after the fire?

LETTER ASSESSMENT RUBRIC

	Level 4 4 - 5	Level 3 3	Level 2 2	Level 1 1
Format	The learner has used the correct format. The address, salutation and ending are correctly placed and punctuated.	The learner has mostly kept to the correct format. The address, salutation and ending are mostly correctly placed and punctuated.	The learner has tried to keep to the correct format but has put some items in the wrong places. S/he has also made some punctuation errors.	The learner has not kept to the correct format.
Tone and register	The learner has used the appropriate tone and register throughout the letter	The learner has used the tone and register well.	The learner has tried to use a little bit of tone and register.	The learner did not use tone and register at all.
Paragraphs and sentences	The learner has used at least three paragraphs. S/he has linked these to one another. S/he has used a range of different sentences.	The learner has used at least three paragraphs. S/he has linked these to one another.	The learner has used at least three paragraphs.	The learner has not used paragraphs properly.
Topic	The learner has kept to the topic. S/he writes as the uncle would, giving advice and support.	The learner has kept to the topic.	The learner has mostly kept to the topic.	The learner has not kept to the topic.

ACTIVITY 5.2

LO	AS	CONTENT	ACTIVITY	RESOURCE
6	Uses prefixes, stems, suffixes	Story	Check and record nouns and verbs from the story	Picture: Shack fire horror

SHACK FIRE HORROR SunNews Sunday 20 February 2005

Written by: PONKO KA MASIBA

Nomboniso Mkabus (35) of Samora Machel informal settlement in Cape Town is unable to talk and lies motionless in the GF Jooste Hospital intensive care unit after suffering third-degree burns in a shack fire earlier this week.

However, the biggest tragedy of all is that her husband, Sabelo, and their two children, Mzukisi (9) and Onele (3) died in the inferno in the early hours of Monday morning and she knows nothing about it. According to her sister, Boniswa, the cause of the fire is unknown.

"My sister is not aware that her family has been wiped out by the fire," she says. "We can't tell her at this stage because she is still critical. Besides, she seems to be confused and can't talk." When *Sunday Sun* visited the destroyed shack, green flies were swarming around the burnt-out ruins, feasting themselves on what appeared to be human fat and blood. No funeral arrangements have yet been made.

A hospital official described Mkabuza's condition as serious but stable. "She is improving day by day, but still can't talk. "Because of her bad condition, we have agreed with the family that no visitors be allowed until further notice."

- Identify verbs and nouns and write them in their activity books
For example: Verbs → Talk Nouns → Fire
- Use the following words to write 5 sentences:
shack
wind
burn
charcoal brazier
"Imbawula"
- Use the prefixes "un"/"in"/"dis" to form opposites of the following words taken from the passage:
know
human
official
notice
aware
made
stable
agreed
allowed

ACTIVITY 6

HOW TO WORK SAFELY WITH FIRE

- ⑥ Write the letters A - G in your workbook.
 - ⑥ Read the information provided and match it to the relevant picture.
 - ⑥ Indicate by writing the number of the sentence next to the letter of the picture.
1. Do not leave matches, petrol, paraffin or any other flammable substances where children can play with them.
 2. Do not start a fire near highly flammable substances such as wood, paraffin, petrol or gas.
 3. Keep young children away from open flames and hot stoves.
 4. Always keep a bucket of sand near a fire in case it gets out of control.
 5. Do not make a fire in a closed room where the smoke cannot escape. Smoke and fumes can damage your health.
 6. Do not sleep in a room with the fire or a lamp or candle burning.
 7. If a person has serious burns, seek help from a doctor or clinic as soon as possible.



A. _____



B. _____



C. _____



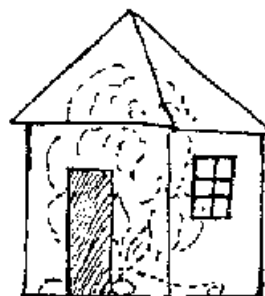
D. _____



E. _____



F. _____



G. _____

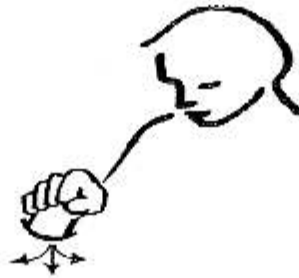


SIGN LANGUAGE

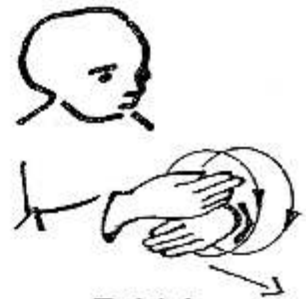
How can I tell my friend who cannot hear, what to do in case a fire breaks out?
We can tell him/her by using sign language.



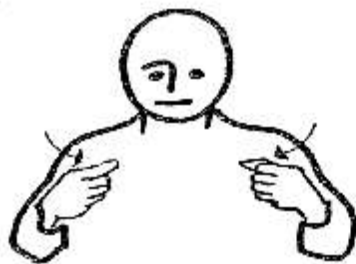
STOP



DROP



ROLL



CLOTHES



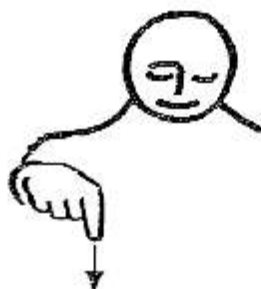
FIRE



DON'T



RUN



DOWN



FLOOR



LIE



ROLL



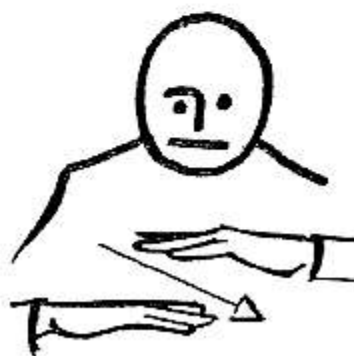
FIRE



STOP



CRAWL



UNDER



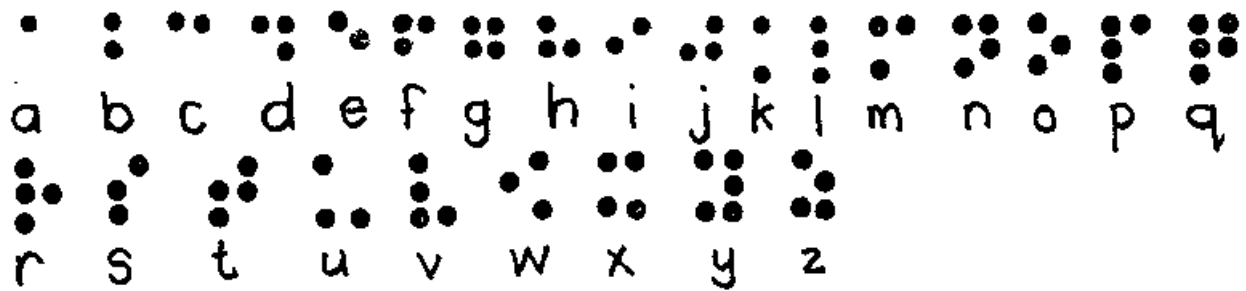
SMOKE

- ⑥ Make sure that your classmates who cannot hear will also get this message.
- ⑥ We always need to take care of disabled people and include them in our activities.

Although blind people can hear when there is a fire alarm, and can hear that they must stop, drop and roll, we must also help them to crawl low under the smoke and show them the way by, leading them in case of fire.

If we want to let them “read” about fire, we must use the Braille alphabet. It consists of dots that the blind person can “feel” with his or her fingertips. The dots are little humps made by a special typing machine.

This is what the alphabet looks like:

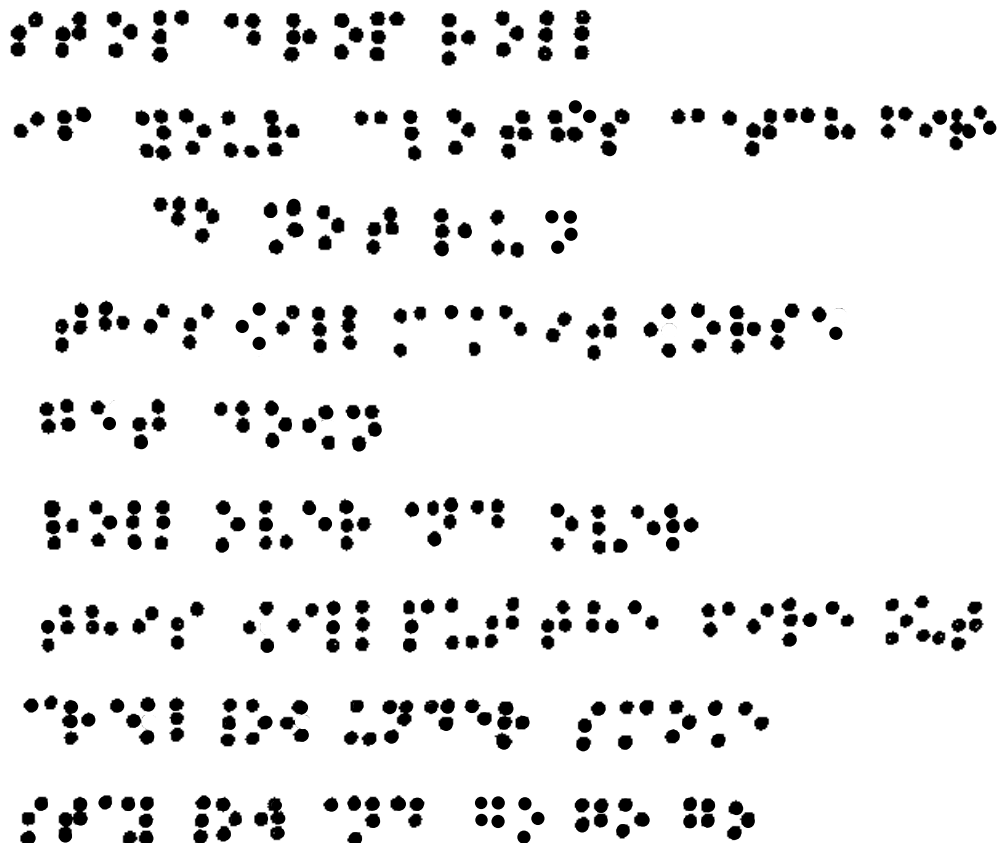


ACTIVITY 1

If you want to “feel” the letters, use a paper punch and punch a piece of sandpaper. Stick the small circles in the patterns of the letters.

ACTIVITY 2

- ⑥ See if you can read what the blind person had written here.
- ⑥ Make use of the Braille alphabet.
- ⑥ Use the alphabet and decipher the message on this page.
- ⑥ Write the letters below the dotted patterns.



Do remember to be thankful for the ability to see and hear!

AFRIKAANS HUISTAAL



LEES DIE ONDERSTAANDE GEDEELTE EN DOEN DIE OEFENINGE WAT DAARP VOLG.

In Suid-Afrika, soos in baie ander dele van die wêreld, is wegholbrande 'n werklikheid. Ons land word elke jaar deur groot brande geteister.

Tientalle mense sterf en derduisende mense word dakloos gelaat, veral in plakkerskampe waar hutte na aan mekaar geleë is.

In Junie verlede jaar (2005) het drie mense van een gesin doodgebrand in Oranje Farm, Gauteng, toe 1500 woonplekke onder vlamme deurgeloop het. Die nuwe jaar het skaars begin of brandbestryders het bontgestaan met veldbrande in Muizenberg, Distrik Ses en teen Vlaeberg, waarin verskeie eiendomme afgebrand en honderde mense skade gely het. Op 19 Januarie is 'n baba dood en 12 000 mense dakloos gelaat in 'n brand in die Joe Slovo-gemeenskap in die Wes-Kaap.

In 2000 het hektaars fynbos in die Kaapse Skiereiland en groot stukke weiveld in die Oos-Vrystaat in groot veldbrande in die slag gebly. Die jaar daarna is 22 huise in Gordonsbaai aan die Valsbaaise kus in puin gelê deur 'n veldbrand.

- ⦿ Sulke brande kan groot verwoesting saai. Behalwe huise wat afbrand, kan mense ook seerkry en verkeer tot stilstand gedwing word wanneer die verterende vlamme oor die pa trek.
- ⦿ Mense moet al die moontlike doen om sulke veldbrande te voorkom of dadelik aan te meld as hulle dit opmerk.
- ⦿ Tog is dit belangrik om te weet dat alle brande nie net verwoesting saai nie. Veldbrande is 'n natuurlike verskynsel wat ook goed vir die omgewing kan wees.
- ⦿ Klink dit vreemd? Volgens kenners is kleiner veldbrande af en toe goed vir die oorlewing van baie plantspesies.

Beantwoord die volgende vrae oor die leesstuk



VRAAG 1

- 1.1 Hoe gereeld word inwoners van Suid-Afrika deur veldbrande bedreig?
- 1.2 Wanneer het die eerste veldbrand in 2005 uitgebreek?
- 1.3 Noem die drie plekke wat deur hierdie veldbrande geteister is?
- 1.4 Wathet in die Joe Slovo-gemeenskap gebeur wat hulle baie hartseer gemaak het?
- 1.5 Waar het veldbrande in 2000 groot skade aangerig?

Wat veroorsaak brande?

Winderige, warm en droë weerstoestande skep 'n gunstige klimaat vir die verspreiding van 'n vuur. Brande kan of mensgemaak wees of deur die natuur veroorsaak word. In die natuur kan weerlig, weerkaatsing en rotes wat neerstort brande begin. Die meeste word egter deur die mens gestig. Sigarette wat in droë gras gegooi word, braaivleisvure wat nie behoorlik geblus is nie, vure in dromme wat hitte verskaf en elektriese foute kan brande laat uitbreek. Selfs 'n bottle wat in die veld lê, kan 'n brand veroorsaak as die so daarop skyn dat dit soos 'n vergrootglas die son op 'n kol droë gras fokus.





VRAAG 2

Omkring soveel woorde as wat jy kan in die woordblok hier onder. Al die woorde het te make met brande. Probeer die volgende 18 woorde kan identifiseer.

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

vuur	brand	vlamme	brandwonde	hitte
puin	skade	veld	weerlig	verwoes
dakloos	braaivleisvure	vlug	brandweer	natuur
sigarette	brandbestryder	dakloos	doodgebrand	



VRAAG 3

Lees weer die leesstukke en haal die volgende woorde uit die leesstuk

- 3.1 Soek 3 woorde wat uit meer as een woord saamgestel is.
Bv. Veld + brande
- 3.2 Identifiseer 5 meervoude. Bv: mens - mense
- 3.3 Skryf 'n sin neer wat 'n vraag vra (vraagsin) neer uit die leesstuk.



VRAAG 4

Lees die volgende sinne en vorm een sin van die twee sinne deur die woord tussen hakies te geruik.

- 4.1 Brandbestryders probeer hulle bes. Mense se lewens is in gevaar. (want)



VRAAG 5

Klasbespreking (Groepbespreking)

Watter slegte dinge gebeur met die volgende groepe as daar wegholveldbrande is.

- ⑥ Mense
- ⑥ Diere
- ⑥ Natuur

AFRIKAANS EERSTE ADDISIONELE TAAL



LEES DIE ONDERSTAANDE GEDEELTE EN DOEN DIE OEFENINGE WAT DAARP VOLG.

In Suid-Afrika, soos in baie ander dele van die wêreld, is wegholbrande 'n werklikheid. Ons land word elke jaar deur groot brande geteister.

Tientalle mense sterf en derduisende mense word dakloos gelaat, veral in plakkerskampe waar hutte na aan mekaar geleë is.

In Junie verlede jaar het drie mense van een gesin doodgebrand in Oranje Farm, Gauteng, toe 1500 woonplekke onder vlamme deurgeloop het. Die nuwe jaar het skaars begin of brandbestryders het bontgestaan met veldbrande in Muizenberg, Distrik Ses en teen Vlaeberg, waarin verskeie eiendomme afgebrand en honderde mense skade gely het. Op 19 Januarie is 'n baba dood en 12 000 mense dakloos gelaat in 'n brand in die Joe Slovo-gemeenskap in die Wes-Kaap.

In 2000 het hektaars fynbos in die Kaapse Skiereiland en groot stukke weiveld in die Oos-Vrystaat in groot veldbrande in die slag gebly. Die jaar daarna is 22 huise in Gordonsbaai aan die Valsbaaise kus in puin gelê deur 'n veldbrand.

- ⦿ Sulke brande kan groot verwoesting saai. Behalwe huise wat afbrand, kan mense ook seerkry en verkeer tot stilstand gedwing word wanneer die verterende vlamme oor die pad trek.
- ⦿ Mense moet al die moontlike doen om sulke veldbrande te voorkom of dadelik aan te meld as hulle dit opmerk.
- ⦿ Tog is dit belangrik om te weet dat alle brande nie net verwoesting saai nie. Veldbrande is 'n natuurlike verskynsel wat ook goed vir die omgewing kan wees.
- ⦿ Klink dit vreemd? Volgens kenners is kleiner veldbrande af en toe goed vir die oorlewing van baie plantspesies.

Beantwoord die volgende vrae oor die leesstuk



VRAAG 1

- 1.1 Hoeveel mense van een gesin het doodgebrand by Oranje Farm?
- 1.2 Noem die drie plekke wat deur hierdie veldbrande geteister is?
- 1.3 Waar het 22 huise afgebrand?
- 1.4 Waar het veldbrande in 2000 groot skade aangerig?
- 1.5 Wat moet motoriste doen as vlamme oor die pad trek?

Is die volgende stelling WAAR of ONWAAR. Motiveer jou antwoord.

- 1.6 Brande saai nie net verwoesting nie, maar kan ook goed vir die omgewing wees.

Wat veroorsaak brande?

Winderige, warm en droë weerstoestande skep 'n gunstige klimaat vir die verspreiding van 'n vuur. Brande kan of mensgemaak wees of deur die natuur veroorsaak word. In die natuur kan weerlig, weerkaatsing en rotes wat neerstort brande begin.

Die meeste word egter deur die mens gestig. Sigarette wat in droë gras gegooi word, braaivleisvure wat nie behoorlik geblus is nie, vure in dromme wat hitte verskaf en elektriese foute kan brande laat uitbreek. Selfs 'n bottle wat in die veld lê, kan 'n brand veroorsaak as die so daarop skyn dat dit soos 'n vergrootglas die son op 'n kol droë gras fokus.



VRAAG 2

Omkring soveel woorde as wat jy kan in die woordblok hier onder. Al die woorde het te make met brande. Probeer 20 woorde identifiseer.

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

Vuur
puin
dakloos
sigarette
brand

skade
braaivleisvure
brandbestryder
vlamme
veld

vlug
dakloos
brandwonde
weerlig
brandweer

doodgebrand
hitte
verwoes
natuur



VRAAG 3

Voltooi die table deur die regte antwoord te gee. Kyk ook na die voorbeeld.



VRAAG 4

Skryf elke keer 'n woord neer met die teenoorgestelde betekenis as die gegewe woord.

WOORD	TEENOORGESTELDE BETEKENIS
1. Nat	
2. Koud	
3. Eindig	
4. Groter	
5. Ongunstige	



VRAAG 5

Lees die volgende sinne en vorm een sin van die twee sinne deur die woord tussen hakies te geruik.

5.1 Brandbestyders probeer hulle bes. Mense se lewens is in gevaar. (want)

LIFE ORIENTATION



STOP POLLUTION

and protect South Africa's
environment



ACTIVITY 1

A FIRE IN THE VELD

- Your teacher is going to use this story as a reading exercise as well as an exercise in reading comprehension.

A FIRE IN THE VELD

Simon and Kyle were two naughty boys. They lived next to an open veld. Lots of birds, animals and insects lived in the veld.

There was a weaver bird's nest in an acacia tree. It had eggs in it.

A mongoose and her two babies lived in a pile of dry grass.

There were also four grasshoppers, a brown snake, three mice, six beetles and a beehive. All the creatures lived happily in the veld. Simon and Kyle loved to play there. It was their favourite place.

One day Kyle found a box of matches. Simon and Kyle decided to hide in the veld and light them. One by one they lit the matches and blew them out.

"Let's make a fire," said Simon. The two boys made a nice pile of sticks and dry grass. Kyle lit a match and set it alight.

The fire crackled.

"Look at the flames," said Simon. "Feel the heat," said Kyle.

The fire crackled.

The flames grew higher and higher.

The fire crackled louder.

"I think we should put the fire out now," said Simon. So the boys beat the fire with sticks. But the flames grew bigger and bigger.

The fire crackled louder, louder.

"I can't stop the fire!" shouted Kyle. "It's getting hotter!" yelled Simon. The boys tried to put the flames out by beating them with their jerseys.

But the fire crackled even louder.

Simon and Kyle were very scared of the fire. So were the birds, insects and animals.

The boys saw the weaver bird fly away from her nest. The whole acacia tree was covered in flames. The boys saw the mongoose and her babies running for their lives with flames behind them. The boys saw a swarm of bees buzzing away loudly. Their hive was burning.

The fire crackled very loudly!

Simon and Kyle saw insects flying, a snake slithering and mice all running for their lives. Very soon Simon and Kyle had to run too. The flames were as tall as a house. All of a sudden the boys heard the sound of a fire engine. What does a fire engine sound like?

Make the sound ! ! !





The fire fighters worked quickly. They beat the flames with big fire beaters and squirted lots of water with a hose. The fire fighters soon put the fire out.

Simon and Kyle came back to the veld to look at their favourite place. They were very sad. It was all black and smoky. There was no grass and even the tree was burned.

The weaver bird had gone. The beehive was gone. The snake had gone. The mice had gone. The insects had gone. Even the mongoose had gone.

"I wish we hadn't started the fire," said Simon. "Me too," said Kyle.

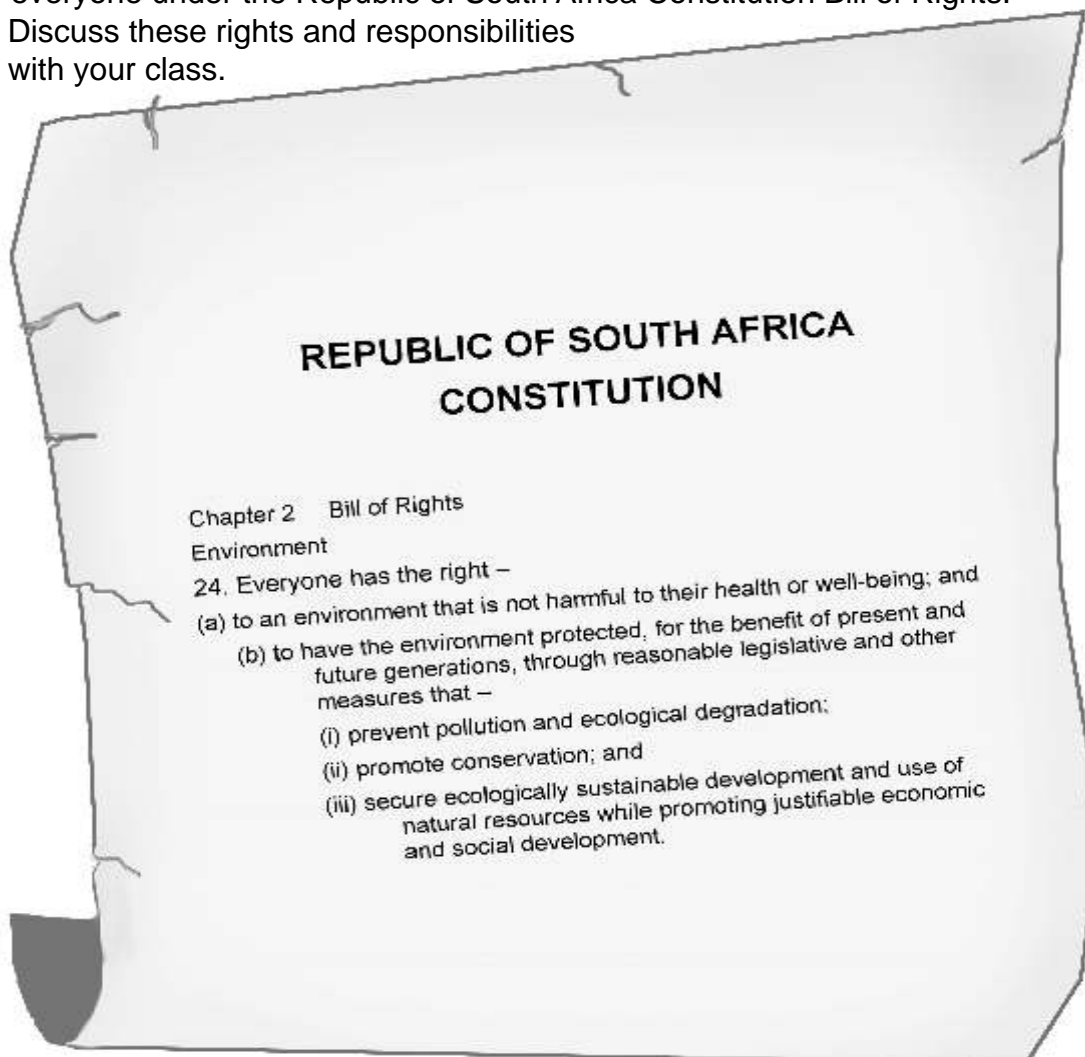
From that day on Simon and Kyle never played with matches again.

ACTIVITY 2



KNOW YOUR RIGHTS AND RESPONSIBILITIES

- Understand and be able to tell in your own words the rights and responsibilities of everyone under the Republic of South Africa Constitution Bill of Rights.
- Discuss these rights and responsibilities with your class.



ACTIVITY 3



FIRE AWARENESS BOOKMARK

It is important that each of us protects and helps to sustain our country's rich diversity. These national symbols are of particular importance to us if we want our future generations to see them. We can help to protect them by learning about the dangers of wild fires that threaten them.

By protecting the natural resources, you make them your own! When you own them, you will be proud of them and want to take care of them.

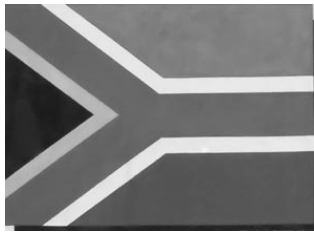
Our country has a rich plant and animal life. This richness is represented by the national symbols for our natural resources. These include the Blue Crane, the Galjoen fish, the Springbok, the Protea and the Real Yellowwood tree. Preventing wild fires protects your national symbols.

Carefully cut these out to paste to your bookmark.

Reprinted from: Environmental Diary 2005, Sustainable Living at Work



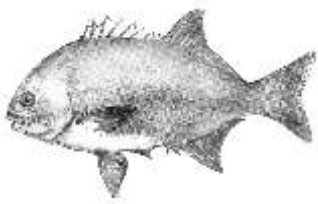
National Coat of Arms



National Flag



Blue Crane



Galjoen



Springbok



Protea



Real Yellowwood Tree

Our National Anthem is also a Republic of South Africa National Symbol. It has not been included here because it will not fit on your bookmark. Sing the National Anthem as you work on your bookmark.



FIRE AWARENESS BOOKMARK

- ⑥ Your teacher will hand you a copy of the bookmark below.
- ⑥ Cut out the bookmark from this copy, fold it in half lengthwise and glue the back sides together.
- ⑥ Cut out the national symbols and glue them to the back of the bookmark.
- ⑥ Punch a small hole at the top of the completed bookmark and attach a length of string or colourful knitting yarn for decoration.
- ⑥ If desired cover both front and back sides of your bookmark with clear adhesive film.
- ⑥ Read the information on the bookmark. It also teaches us how to prevent destructive fires.

FOLD ON CENTRE LINE	
CUT ALONG THE BROKEN LINE	CUT ALONG THE BROKEN LINE
<div style="text-align: center;">○</div> <h3 style="text-align: center;">PREVENT VELDFIRES</h3> <p>Most wild fires are started by people being careless. All fires start small! But when the weather is hot, dry and windy a small fire can quickly become a threat to life and property.</p> <p>Veldfires often start close to the home, and can cause injuries, death and loss of personal belongings. To stop these fires from happening:</p> <ul style="list-style-type: none">⑥ DO get rid of hot ash and coal from heating and cooking in a safe place where there is no plant material that can catch alight.⑥ DO cover an open fire with sand to smother it.⑥ DO always work in an open, cleared area when working with power tools. Power tools like angle grinders, welders and chainsaws make sparks which can ignite the surrounding veld.⑥ DO make sure that there are no illegal electrical connections connected or near your home and that electrical appliances are correctly wired. Illegal and faulty electrical connections can get hot and start to burn.⑥ DO keep the area around your home clear of material that can burn, such as firewood, kindling and garbage.⑥ DON'T burn garbage on a hot and windy day as the fire can easily spread and cause a wildfire.⑥ DON'T play with matches!⑥ DON'T throw away burning cigarette ends.⑥ DON'T leave an open fire unattended.	<div style="text-align: center;">○</div> <p style="text-align: center;">PASTE SYMBOLS HERE</p>
CUT ALONG THE BROKEN LINE	CUT ALONG THE BROKEN LINE

ACTIVITY 4



FIRE ESCAPE PLAN, MAP AND FIRE DRILL

- ⑥ Draw an aerial view of school buildings on a copy of a grid your teacher will hand out. Darken the location of your classroom.
- ⑥ In groups of two, leave your classroom with your grid and a pencil.
- ⑥ Invent an "All Clear" signal.
- ⑥ Use the grid drawing of your school to map out a fire escape route from your classroom to a safe place where everyone will stay until hearing the "All Clear" signal to return to class.
- ⑥ Appoint FIRE DRILL MONITORS who will observe the fire drill using the questions on the next page.
- ⑥ Practise the fire drill.
- ⑥ Participate in a discussion about the success of your drill.
- ⑥ Paste your completed plan on your workbook.



FIRE ESCAPE PLAN, MAP AND FIRE DRILL

VOLUNTEER TO BE A FIRE DRILL MONITOR ! !

In case of fire this is your opportunity to make sure that your school and all your friends will leave their classrooms and the school building safely.
It's fun!

FIRE DRILL MONITORS SHOULD ANSWER THESE QUESTIONS:

1. Did learners remain calm and follow directions in an orderly fashion?
2. Did your class evacuate quickly enough?
3. Were learners with physical handicaps given assistance?
4. What first-aid techniques should learners apply if someone's life is at risk?
5. If you notice a fire, who should you phone or otherwise inform?
6. What safety measures can everyone put in place during a fire?

Reprinted from: www.you.co.za February 17, 2005

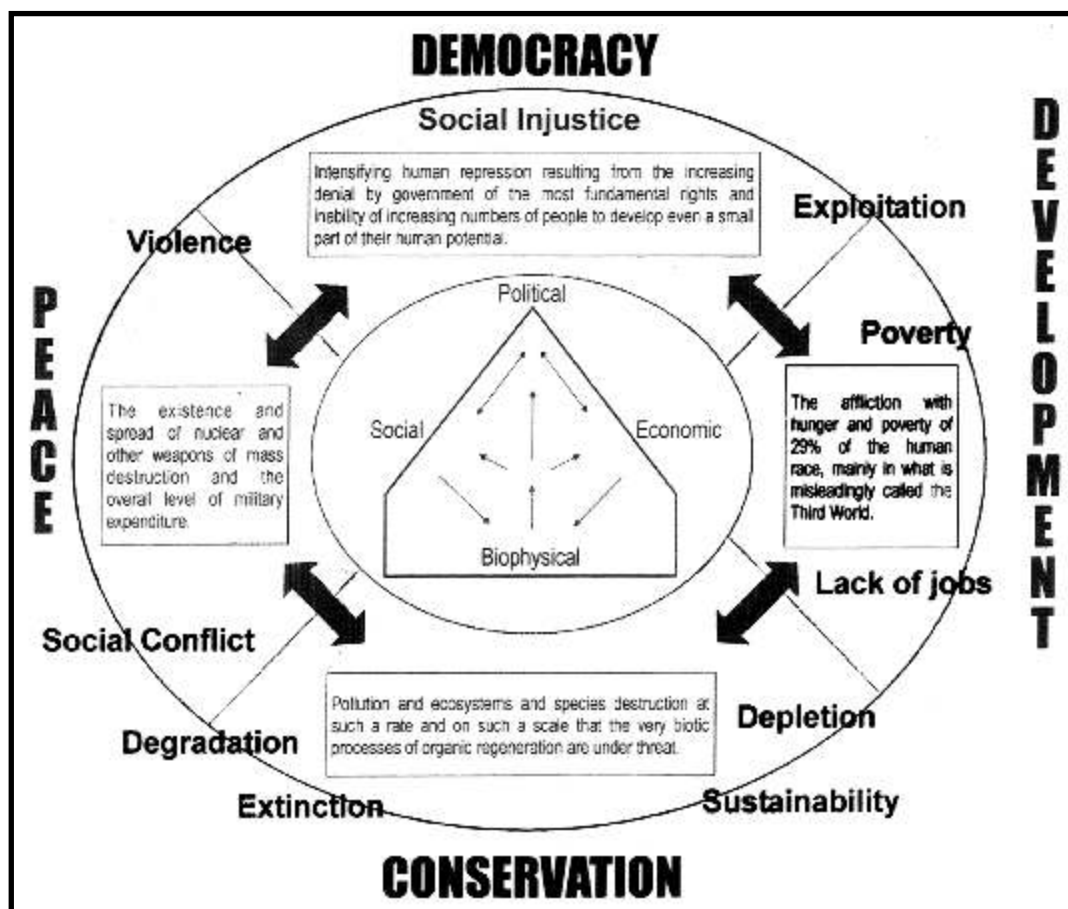
ACTIVITY 5

MY ROLE IN KEEPING SOUTH AFRICA BEAUTIFUL

- ⑥ In your groups look at the Conservation diagram.
- ⑥ In your groups think about how wild and uncontrolled fires can endanger lives and property.
- ⑥ Study the aspects written in bold and discuss how they could be related to wild fires.
- ⑥ Make a list of ways in which each of you can help to raise fire prevention awareness in your community and help prevent fires to keep South Africa beautiful.
- ⑥ Present your list of ideas as your teacher writes them on the board.



CONSERVATION DIAGRAM



ACTIVITY 6



JUNIOR FIRE MARSHAL QUIZ

- ⑥ Answer all the questions correctly next to the correct numbers in your workbook.
- ⑥ There will be a ceremony to award successful learners the Junior Fire Marshal Certificate
- ⑥ You can take the certificate home to hang on your wall.

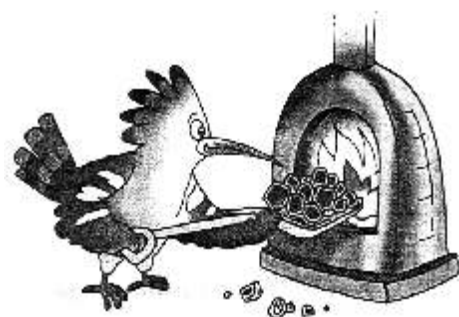
T = True

F = False

Tick the correct one.

1. What protects the beauty of my South Africa environment for me and for future generations? Write a sentence.

- | | | | |
|-----|---|---|---|
| 2. | It is my responsibility to pollute our land. | T | F |
| 3. | Big fire beaters and lots of water will help to keep a veld fire burning. | T | F |
| 4. | What should I do if my clothes catch fire? | | |
| | _____, _____, and _____ | | |
| 4. | It is not my job to report fire hazards. | T | F |
| 5. | A burning plantation is something I should be concerned about. | T | F |
| 6. | If I see matches in a room I should pick them up. | T | F |
| 7. | Burning garbage helps to recycle and prevent pollution. | T | F |
| 8. | Most wild fires are started by people being careless. | T | F |
| 9. | My school and home do not need a fire escape plan. | T | F |
| 10. | Being a fire marshal is a very important job. | T | F |



HERE'S A THOUGHT !
MAKE YOURSELF A FIRE MARSHAL FOR YOUR OWN HOME.

Take these questions and answers about Fire Prevention home to ask your family members and neighbours. Help everyone become aware of the value of protecting our natural resources.

JUNIOR FIRE MARSHAL CERTIFICATE

Be it acknowledged that

learner's name

*has successfully completed
the
South African Fire Administration
Jr. Fire Marshal Quiz*

and . . .

*has proven to be better prepared
and more knowledgeable about
how to prevent veld wild fires.*

On this day,



Date



OVERALL PROGRAM - ASSESSMENT RUBRIC

	4	3	2	1	POINTS
LEVEL OF ENGAGEMENT IN CLASS	Learner proactively contributes to class by offering ideas and asking questions more than once per class.	Learner proactively contributes to class by offering ideas and asking questions once per class.	Learner rarely contributes to class by offering ideas and asking questions.	Learner never contributes to class.	
LISTENING SKILLS	Learner listens when others talk, both in groups and in class. Learner incorporates or builds on the ideas of others.	Student listens when others talk, both in groups and in class.	Learner does not listen when others talk, both in groups and in class.	Learner does not listen when others talk, both in groups and in class. Learner interrupts.	
BEHAVIOUR	Learner almost never displays disruptive behaviour during class.	Learner rarely displays disruptive behaviour during class.	Learner occasionally displays disruptive behaviour during class.	Learner almost always displays disruptive behaviour during class.	
ATTITUDE	Learner almost always approaches project assignments with interest.	Learner usually approaches class projects with interest.	Learner rarely approaches class projects with interest.	Learner almost never approaches class projects with interest.	
CREATIVITY	Learner displays creativity and enthusiasm for class projects.	Learner usually displays creativity with class projects.	Learner rarely displays creativity or enthusiasm with class projects.	Learner almost never shows creativity or enthusiasm for class projects.	

ACTIVITY 1

This activity focuses on the damage caused by fire

As you know, in 2003 there were a lot of veld and forest fires in Mpumalanga.

One of these forest fires caused a lot of damage to the property of a farmer.

The farmer lost the following property in the fire:

- Ⓒ A house to the value of R 435 000
- Ⓒ Furniture to the value of R 600 000
- Ⓒ A safe which contained R 170 000
- Ⓒ 26 cattle, each worth R 2 735
- Ⓒ 5 tractors, each worth R 75 000
- Ⓒ a private car worth R 126 000

Answer the following questions based on the information supplied above:

1.1. How much money was lost in cattle and tractors?

1.2. Calculate the damage caused by the fire to the entire farm.

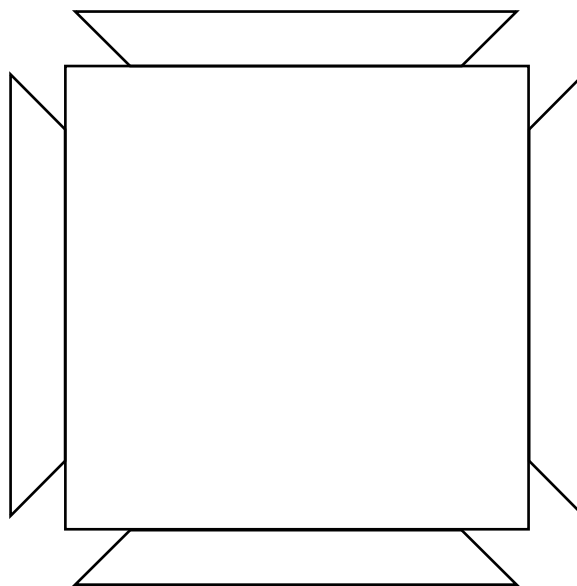
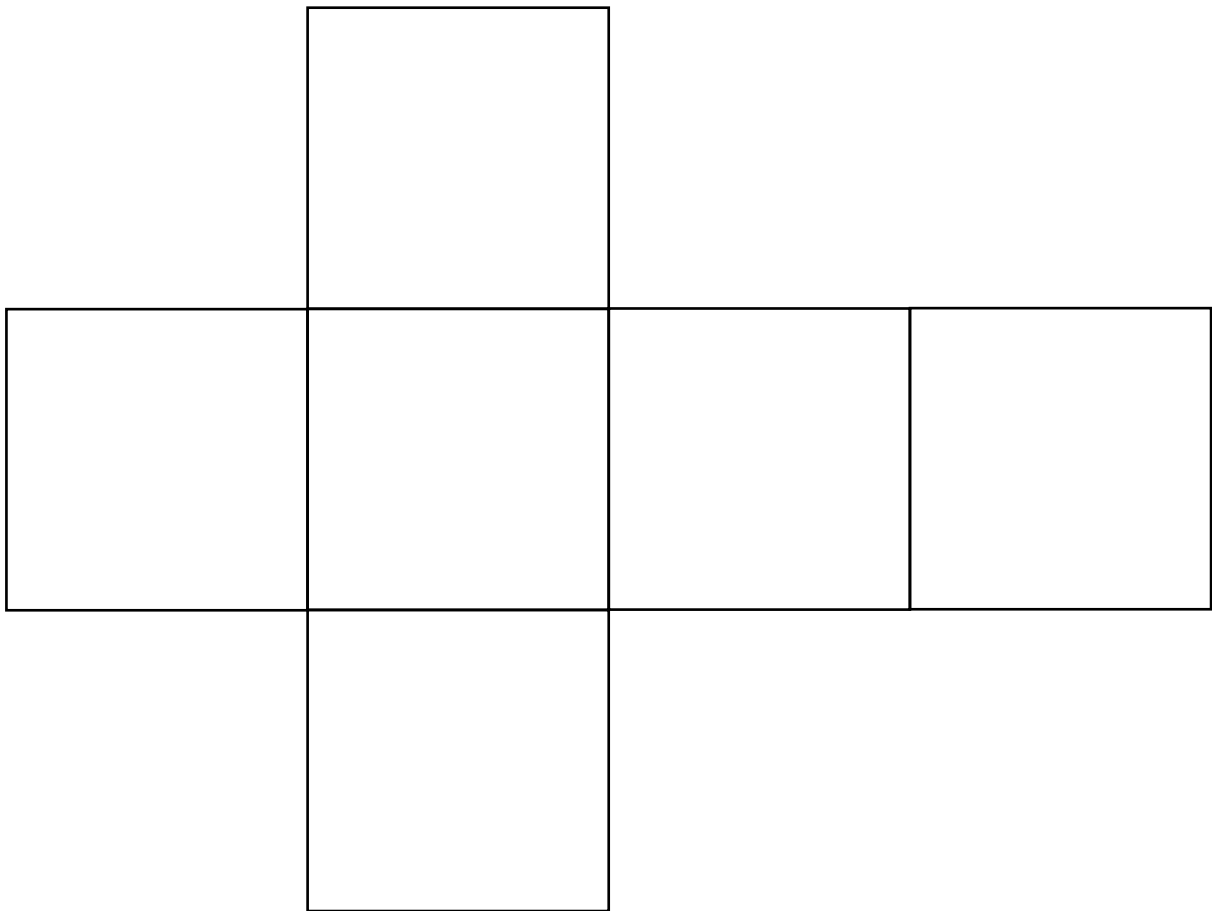
1.3. The safe was one of platonic solid (i.e. 3D object), calculate the perimeter if each side was 15cm long.

- 1.1. Divide into small groups and make your own safe by following the instructions below. The teacher will provide you with the necessary resources. You will need the template that is on the next page of your activity book.

Place the template on a flat piece of cardboard and trace around it using a pen.

- ⑥ Remember to trace 6 templates as shown in the example.
- ⑥ Cut out the shape.
- ⑥ Write a different way to prevent wild fires on each “face” of your safe box. This will be a good reminder how to safeguard your valuables from fire destruction.
- ⑥ Firmly score the flap fold lines with a pen.
- ⑥ Fold up the flaps.
- ⑥ Use the elastic bands to hold the flaps when making the safe box. You can put glue on the flaps to keep them intact.
- ⑥ What do we call the shape of the box?
- ⑥ After you have made your solid, complete the following table in your book by counting the number of vertices, edges and faces.

Shape	No. of vertices	No. of edges	No. of faces



ACTIVITY 2

The following greenhouse gases contribute to global warming:

Carbon dioxide	= 50%
Ozone	= 8%
Nitrous oxide	= 5%
Methane	= 13%
CFC	= 22%
Other	= 2%

- 2.1 Use the figures above to draw a Pie chart.
- 2.2 Which gas contributes most to the greenhouse effect?
- 2.3 Does the veld and forest fire contribute to this gas?
- 2.4 What advice would you give to your school friend about starting illegal fires?

ACTIVITY 3

In 2003 there was a large forest and veld fire in Mpumalanga.

- ⑥ The fire destroyed
 - ⑥ 28 336 hectares of plantation.
 - ⑥ One hectare consists of 1 666 trees.
 - ⑥ The average value of a mature tree is R 10.
- 3.1 How many trees were burnt down?
 - 3.2 How much money was lost when the plantation was destroyed
 - 3.3 How many square metres are there in a hectare?
 - 3.4 Would you classify a hectare as a 2D shape or as a 3D object?
 - 3.5 How many m² of plantation were burnt down?
 - 3.6 Is it necessary for a human being to protect the environment from the unwanted fires?
Give reasons.

ACTIVITY 4

AERIAL ASSISTANCE IN THE FIRE HAZARD OF 2003

In 2003 several uncontrolled forest fires broke out throughout Mpumalanga. These fires were spread over large areas and the Forest Fire Association's (FFA) aerial resources were stretched to the limit in fighting the fires. The FFA used their aeroplanes to spray the fires from the air. They sprayed water and chemicals on the fires to put them out.

- The cost of one litre of chemicals is R5,25
- About 1 712 litres chemicals were used
- About 21,700,000 litres of water were used

Total hours flown:

Different aeroplanes were used. The FFA used spotter aeroplanes to look for the fires. Bomber aeroplanes and helicopters were used to fight the fire from the air, by spraying water and chemicals onto the fire to put them out.

Aircraft	Hours	Total Cost
Spotter aircraft	100.7	R 121 111, 89
Bomber aircraft	138.7	R 869 649, 00
Choppers	970.0	R 2 543 340,00

TOTAL COST R

The following questions are based on the above information

4.1 Give the value of the underlined digit numbers as per the following example:

Example:

Number: 121 111,89

Value: 100,00

	Number	What is the value of the digit that has been underlined?
1.1	1 <u>2</u> 1 111, 89	R
1.2	869 6 <u>4</u> 9, 00	R
1.3	<u>2</u> 543 340, 00	R
1.4	121 111, <u>8</u> 9	R

4.2 How many hours did each of the three aircraft spend fighting the fire?

Give your answer to the nearest whole number.

4.3 How many days did the three aircraft spend in the air?

4.4 What was the total cost incurred by the three aircraft? Round off the answer to the nearest 100 and then also to the nearest 1000.

Total cost	Nearest Hundred	Nearest Thousand

SOCIAL SCIENCES

ACTIVITY 1



INVESTIGATION OF HOW FIRE WAS DISCOVERED

- ⑥ Listen as your teacher tells about this activity, where you will learn from your elders how they used fire and their ideas or stories about how fire was discovered.
- ⑥ The process is called Data Collection Through Interviews and you will use this skill throughout your life.
- ⑥ For Homework: Gather information from family and community.
- ⑥ Come to class prepared to make a class presentation using all the information you have gathered.

NEW VOCABULARY WORDS:

FRICITION: Rubbing of one surface against another.

FLINT: Very hard stone that can produce sparks when struck with steel.

SMELTING WORKS: A place where ore is heated and melted to obtain the metal it contains.

FORGE: To shape by heating in a fire and hammering into desired shape.



ACTIVITY 1.1

Ask your parents, grand parents, neighbours and/or the elders from your community to tell you any stories they can remember about how fire was discovered many, many years ago. Record these stories in your class workbooks.

ACTIVITY 1.2

Ask your parents, grandparents or community elders to tell any stories they can remember about how fire was used by their ancestors. Write in your class workbooks.

ACTIVITY 1.3

Make a list of the dangers and the benefits of each of the different uses of fire in the stories you collect.

ACTIVITY 1.4

Make a list of how fire is used today by your family, your neighbours, and your community in their homes or in your cultural ceremonies and rituals such as dance, music, and beliefs.

ACTIVITY 1.5

Draw a picture on of how your family or ancestors used fire. Use a full sheet of your classwork book.

ACTIVITY 1.6

Bring to class any articles used by your ancestors or family to keep fire burning for cooking, hunting or for keeping warm. Prepare yourself to tell the class about what it was used for.

ACTIVITY #1 - RUBRIC FOR ASSESSMENT

	1	2	3	4	POINTS
Returned homework assignment on time.	Completed one interview response question	Completed two interview response questions.	Completed three interview response questions.	Completed four interview response questions.	
Responses are clearly written and easy to read.	One-word sentence.	Two-word sentences.	Three-word sentences.	Four-word sentences.	

ACTIVITY 2

- ⑥ You will be asked to show and tell what you have learned through your interview process with your relatives and community members.
- ⑥ You will tell about your list how fire was discovered, how it was used, and what were the dangers and benefits of each use of fire in the stories you have been told.

ACTIVITY #2 - RUBRIC FOR ASSESSMENT OF YOUR PRESENTATION

	1	2	3	4	POINTS
Brings samples and/or pictures, objects to clarify the interview process.	Voluntarily describes how object, samples or photographs were acquired.	Includes some additional facts not anticipated.	Encourages other Learners to follow this experience.	Develops a plan to expand on the class and homework assignment.	
Presents interview experience to class.	Reads from responses gathered at home.	Adds feelings about asking for parents or neighbours to respond.	Indicates increased learning of the interview process.	Demonstrates confidence in making a class presentation.	

ACTIVITY 3

HISTORY OF FIRE

- ⑥ Listen carefully as your teacher reads, "Life in the Iron Age".
- ⑥ Silently read the story with your teacher.
- ⑥ In your groups create a poster or drawing of how fire was used during the Iron Age.

LIFE IN THE IRON AGE

We are not sure how people first discovered fire. But all the people of the world have a different story to explain how fire was first discovered.

We know that people lived in the Guateng area nearly 900 years ago. They planted crops, kept cattle and made tools from wood, clay and iron. These settlers used fire to provide warmth, for cooking, for protection from wild animals and to extract iron from ore.

Twelve people laboured for ten days to make a spearhead for a weapon. They gathered great mounds of wood, then burned it to make charcoal. The charcoal fuelled the furnace at the smelting works where the spearhead was forged into shape. In time, having used all the wood around, the whole community had to move to another area.

Bird Life South Africa (2000) Learning for Sustainable Living: An Integrated Learning Resource for Environmental

ACTIVITY #3 - RUBRIC FOR POSTER ASSESSMENT

1	2	3	4	POINTS
Group created poster or drawing illustrating how fire was used during the iron age.	Poster was sloppy, incomplete and poorly planned.	Poster illustrates most of the points covered in interviews.	Poster was complete, neatly drawn and included all points from the story.	Poster showed comprehensive understanding and was beautifully executed.

ACTIVITY 4



DISCOVERY OF FIRE

- ⑥ You will read "How Fire Was Discovered".
- ⑥ Discuss within your group the story and answer the questions following the story.
- ⑥ Be prepared to present your answers to the class.



DISCOVERING FIRE

This is a story from the !Kung people who live in Northern Namibia.

Once only Ka Kani had fire. With it he cooked food for himself and his children. One day a man called Huwe went to visit Ka Kani. He was given a piece of roasted antelope meat to eat. "Mmmmm...what a funny taste it is delicious! What have you done to this meat?" asked Huwe.

Ka Kani's son said: "We put it over the fire so that it gets very hot. Then it turns from red to brown."

"And that's what makes it taste so good," said Ka Kani's small daughter. But Huwe didn't really understand them, as he had never seen fire. So the next day he crept back to Ka Kani's camp. Ka Kani spent part of the day prodding up roots with his digging stick. Then Huwe saw him take some pieces of wood out of the hollow tree.

Ka Kani was twirling one stick in a hole in the other stick, saying all the time: "Fire will come, fire will come..." After a while, to Huwe's amazement, the sticks began to smoke. Ka Kani dropped some scraps of dry bark into the smoking hole, then blew gently but steadily into it. Huwe saw a reddening. Ka Kani quickly and carefully tipped the bark into a ball of dry grass. After he had blown on this too, a yellow flame crept out and upwards. Soon Ka Kani was cooking a potful of roots over a blazing fire.

The next day Huwe ran back to Ka Kani's camp and took the firesticks out of the hollow tree. He broke them into a million pieces and then threw them over the whole world. Since then there has been fire in all the wood and men have been able to cook their food and keep warm on cold days.

Acknowledgements: We wish to thank Allison and Busby Limited for permission to adapt this story. Story © John Mercer Primary Science Programme, P. O. Box 3218 Braamfontein 2017, Spider's Place Too Hot To Handle, Exploring Combustion

Think about the story and answer the questions below in your workbook:

1. What happened to the meat when it was put over the fire? Write a sentence.
2. Make a list of everything that Ka Kani used to make the fire.
3. What did Ka Kani do when he saw smoke coming from the stack? Write a sentence.

ACTIVITY 5



THE DANGER OF FIRE

- ⑥ You will now read “New Skills, New Power, New Progress”.
- ⑥ Think about what you can do to help prevent wild fires in rural areas.
- ⑥ Think about good and bad uses of fire.
- ⑥ In a class discussion talk about your new knowledge about the danger of wild fires.



NEW SKILLS, NEW POWER, NEW PROGRESS

Throughout the Old Stone Age, man's progress as a craftsman was painfully slow. Ill-equipped as he was for hunting and fishing, he needed almost all his time just to find enough to eat and drink. Yet the men of the Old Stone Age stumbled onto several inventions which at least laid the foundations of progress. It was they who first found out how to make a sharp cutting edge breaking one stone with another; and it was they who first discovered how to make and use fire.

In nature, fire is a rare and terrible thing, for nature seldom produces fire except by a shaft of lightning or the eruption of a volcano. Yet somehow, early men discovered how to make less terrifying fires, small blazes which they could control. Most likely they made the discovery by accident, when sparks from stones they were knocking together fell on to dry grass and set it smouldering. But however the discovery was made; it was certainly one of immense importance. It enabled men to roast tough, raw meat and make it tasty and tender; it gave them warmth and light by night; and it kept wild animals away from their caves while they slept.

NATURAL SCIENCES



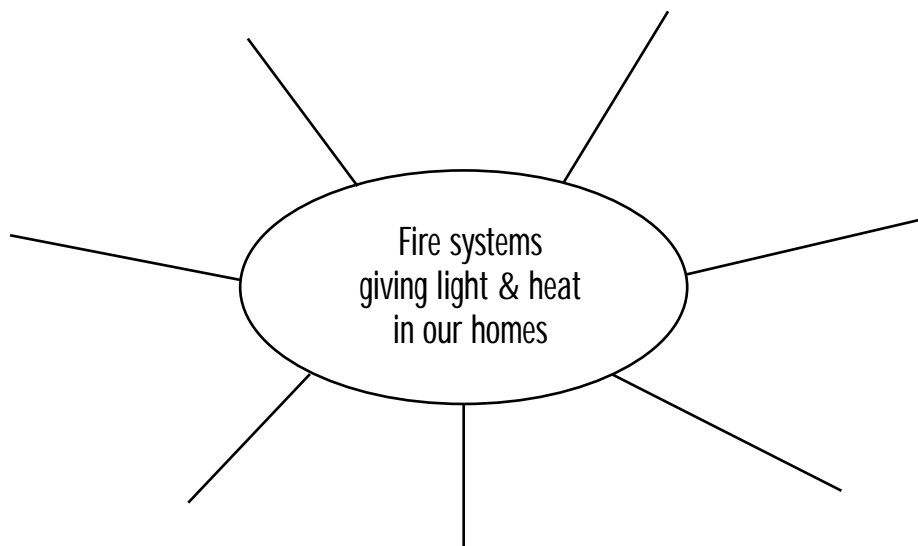
WHAT IS FIRE?

Fire can give us light or heat. In our homes we use systems designed by people. A system consists of more than one part. All the parts working together, make our lives easier. Some of these systems are nothing more than small or big fires or flames that we can use to do useful work for us. These fires use different sources of energy (fuels).

Group activity

ACTIVITY 1

Draw a mind-map on systems giving light and heat in your home/people's homes

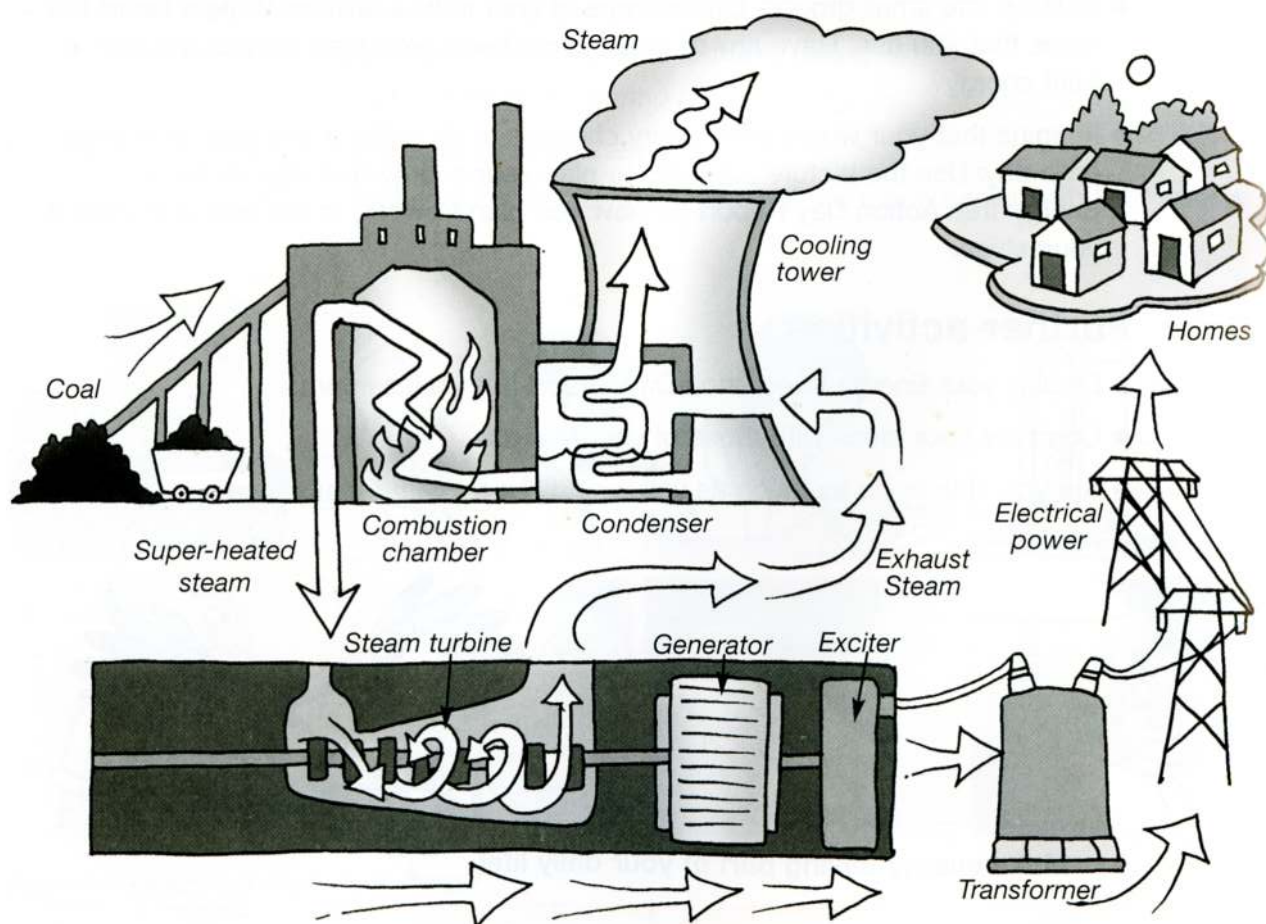


NOTE: Is an electric heater or stove or bulb also a fire?

Discuss the section on power stations and then report back on the above question.



THE DIAGRAM BELOW SHOWS THE ELECTRICITY-GENERATING PROCESS IN A POWER STATION/PLANT



Use the information that follows to interpret this diagram.

WHAT TO DO

Read this simple description of how electricity is made.

- The diagram shows a steam turbine electric power station. p Coal is burned to create the heat to make steam.
- Steam under high pressure is piped into the turbines.
- The steam spins the shafts of the wheels of the turbines.
- These turbine machines produce mechanical energy.
- The turbines drive the generators that produce electricity.
- An electromagnet in the generator creates the char e that is transmitted as electricity.
- Wires carry high voltage electric current from the power station to a sub-station.
- From there the electricity is distributed across South Africa.

Use scientific language to answer these questions.

- How is coal brought into, and used, in the power station?
- Where is water heated into steam, cooled and recycled?
- Where are pollutants released into the air?

Discuss your report with another learner. Is your report clear to him or her?

ACTIVITY 2

Are all fires useful and good to us, or are there fires that are useless and dangerous to us?

Draw two columns in your workbook. Study the 28 examples of fires and flames. Divide the examples of fires into two groups. You must be able to tell why you have divided them the way you have. Make suitable headings to the columns. Only write down the number of the examples, don't write out the words and phrases.

Examples of fires and flames	
1. Candles	15. Lantern
2. Burning house	16. BBQ grill
3. Oil burning in a pan	17. Paraffin stove
4. Imbawula	18. Person's clothes on fire
5. Forest fire	19. Fire break
6. Wood stove	20. Lightning started veld fire
7. Gas bottle exploding	21. Burning wheat field
8. Arson	22. Controlled fire
9. Oil lamp	23. Fire used in hunting
10. Veld fire	24. Furnace/ fireplace
11. Grass fire	25. Burning orchard
12. A shack on fire	26. Burning plantation
13. Gas stove	27. Burning grass to improve grazing
14. Imbawula falling over	28. Fire to clear land

ACTIVITY 3

Your teacher will supply you with copies of a story: Fire in the Vetkoek Pan.
Two of you can share a copy.

ACTIVITY 3.1

In class we are going to play this story, to enable us to recall all this knowledge again in our written activities. It can also be used as a reading lesson or a drama.

You can do this role-play in groups. The sentences are numbered, to make it easier to answer the questions in the written assignment.
Divide in groups of 5.

Assign roles to each member of the group. Fill in the name of the learner who has to read each sentence in this little drama. Then read your parts, put in some actions, and present to the rest of the class! ENJOY IT!!

ACTIVITY 3.2

Recall the story of fire in the pan and answer the following questions:

1. Answer the questions based on the steps in the scientific process.
2. The remarks made by the people around the burning oil, are all numbered.
3. Write the numbers 1 - 11 in your workbooks. Next to it in another column, write down the number of the sentence in the story that matches it.
4. Carefully read the story again and write down the numbers of the sentences in the story that tell us about:

Information given	Number
1. A problem that they experienced	
2. A solution to the problem	
3. All the sentences that suggest hypothesis or a theory	
4. The observations they made	
5. A technological solution to make a fire indoors for warmth	
6. Apply knowledge in another situation	
7. An investigative question	
8. Repeating an experiment to test a result	
9. What science knowledge they gained	
10. Another gas on which they can perform an experiment	
11. Make a conclusion	

ACTIVITY 3.3

BACK IN CLASS:

In this activity you are going to look at experiments that you are going to perform. You can again do a role play by reading the various sentences as if you are the characters. While doing so, you will learn a lot about how scientists work. After this play, you are going to complete a work sheet based on what you have learned and do the experiments yourself.

Let us start with our play!

What happened to Bra Joe?

Bra Joe slept next to the imbawula. They found him unconscious later that night. The burning imbawula used up all the oxygen in the room. The window could not open to let in fresh air. When the fire burns up most of the oxygen, it cannot burn properly. It starts to give off a poisonous gas called carbon monoxide. This gas made Joe unconscious and could have killed him if the others did not arrive on the scene.

Teacher: We have learned from Bra Joe's experience that we cannot live without oxygen. (She draws a triangle on the board, and writes oxygen at the top angle) What else do we need to live?

Sipho: Food, Miss!
(Teacher writes food next to the second angle)

Teacher: Okay, what else do we need? Especially now that winter's coming?

Gift: Jerseys to keep us warm.
(Teacher writes warmth on the third angle)

Jabulani: Miss, when I was young the wind blew down our shack. My family spent the whole night outside. We were very cold. Our friends gave us wood to make a fire.

Sipho: Yes, fire gives us warmth.

Gift: And you can cook on them.

Teacher: That's right. And fires are like us. They also need oxygen, food and warmth. Fuel is the food that fires need. Can you name a fuel?

Sipho: Wood

Gift: Paper

Jabulani: Paraffin

Teacher: That's right. And most often fuels need to be hot enough to start to burn. Fire also need oxygen, but it's hard to show that because oxygen is invisible.

Frans: Can we do the experiment that Jay and Ayanda did with the candle and the glass? That shows that fires use up oxygen.

ALWAYS HANDLE A CANDLE WITH CARE !!

ACTIVITY 3.4



Experiment: Fire needs oxygen to burn

Get a copy of the assessment rubric from your teacher!



Look at this picture.
List the things you will need for the experiment.

2. Collect these things.
3. Conduct the experiment and record data
 - 3.1 Put the small jar over the candle. Time how long it takes before the candle goes out. (In stead of using a watch, learners can "time" by counting at the same pace)
 - 3.2 Record your answer here: When I put the small jar over the candle, it took seconds (counts) before the candle went out.
 - 3.3 Now put the large jar over the candle and record the time it takes before the candle goes out.
 - 3.4 Record your answer here: When I put the large jar over my candle, it took seconds (counts) before the candle went out.
 - 3.5 Talk about why the candle burnt for a longer time in the large jar. Write down what your group has decided (We call this our conclusion): The candle burnt for a longer time in the large jar because:

ACTIVITY 4

(Suggested for Grade 6)

Get a copy of the assessment rubric from your teacher!

Study the information included in the diagrams, flow chart, and text about the fire triangle. Form groups of five learners and make sure each member of your group can explain this information in an oral presentation to the rest of the class.

You will be assessed according to a rubric your teacher is going to give you.

TEXT:

Energy enables work to be done. People, animals and machines require a supply of energy if they are going to do work.

Food and fuels such as coal, oil and wood are stores of chemical energy. Living things are able to release the energy stored in food by a process called respiration. Fuels release their energy when they are burnt in a process called combustion.

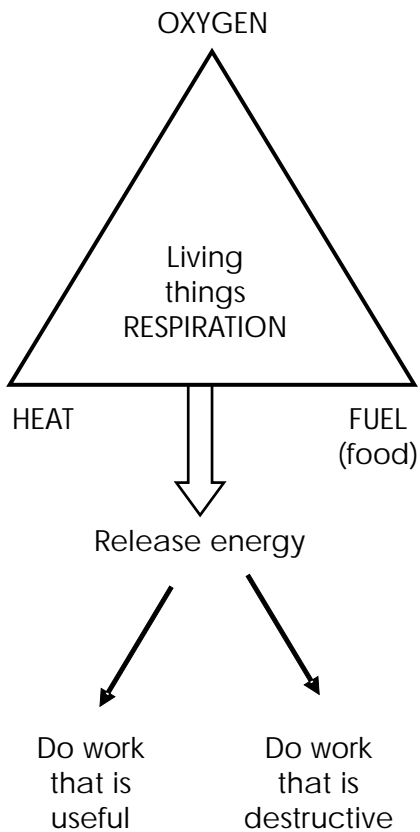
The fire triangle

It is obvious that three elements must be present and satisfactorily combined before combustion can occur and continue. There must be fuel to burn, there must be air to supply oxygen for the flame, and there must be heat to start and continue the combustion process. These three elements can be illustrated into what is referred to as the "Fire Triangle". Remove any single side, and there can be no fire.

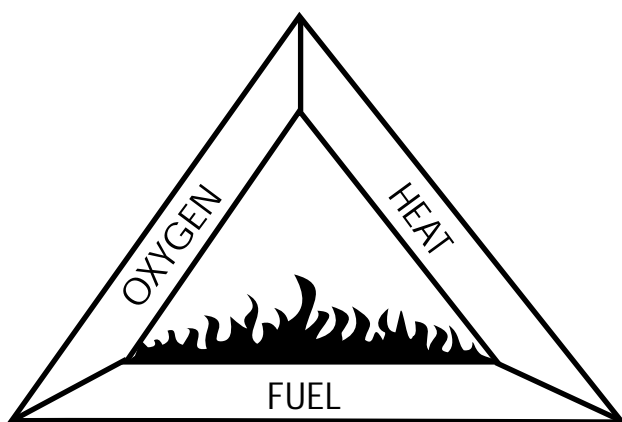
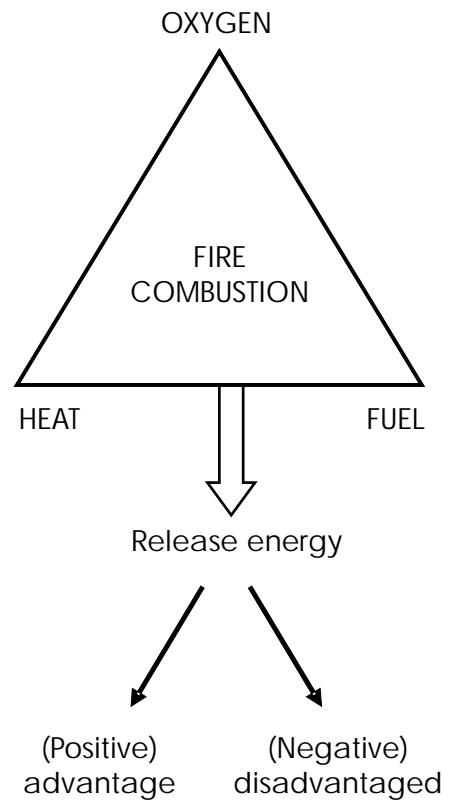


DIAGRAM AND FLOW CHART:

WHAT DOES A FIRE NEED TO BURN, COMPARED TO WHAT LIVING THINGS NEED.



Make a responsible choice!



Fires that are useful are those that we can control. Fires that become out of control are wasteful and destructive.

The fire triangle shows us the three factors that are needed for a fire to burn.

From that we can derive that we could also put out or extinguish a fire by taking away one of these factors.

ACTIVITY 5

Dangers of fire:

Uncontrolled fires can kill, maim or injure people and animals. Homes and property can be damaged or destroyed.

Warning signs:

On some days there is a greater fire danger than on other days. This is due to a number of factors, especially weather conditions, such as temperature and wind strength. To help us prevent forest fires, the South African Weather Bureau has created a Fire Danger Index (FDI). During the fire season, the FDI is an important tool that landowners use to prevent fires.

FIRE DANGER INDEX

Rating	Colour	Danger rating
0 - 19	Blue	The fire danger rating is insignificant – safe to make a fire.
20 - 44	Green	The fire danger rating is low – There is a moderate chance of fire, and fire will spread slowly.
45 - 59	Yellow	The fire danger rating is moderate – conditions are dangerous and fires will ignite easily and will spread rapidly.
60 - 74	Orange	The fire danger rating is high – conditions are very dangerous and fires will ignite easily and will spread rapidly.
75 - 100	Red	The fire danger rating is high – conditions are extremely dangerous. Flames can travel up to 4km per hour and their height can vary from 5 – 15m or more.



Help prevent unwanted fire

- ⑥ Never extinguish a braai fire, campfire with sand only. Rather use water to make sure the coals are dead.
- ⑥ Pick up any glass you see lying in the veld. The sun's rays shining through the glass can cause a fire.
- ⑥ Never go to sleep while there's a fire burning nearby. Fires should be watched at all times.
- ⑥ Don't make fires where there are signs prohibiting you from doing so.
- ⑥ Always take special care with fires when the wind is blowing.
- ⑥ Always have adult supervision when playing with fireworks or conducting experiments which could start a fire.



Do the following task in your workbook.

- 5.1 Use the information on the FDI to construct a bar graph, using the colours indicated for each category (blue, green, yellow, orange or red), indicating the danger of fire, as well as the data given by the South African Weather Bureau during a certain week.

Data given:

Day of the week	Fire index
Monday	40
Tuesday	8
Wednesday	70
Thursday	95
Friday	100
Saturday	50
Sunday	10

In your workbooks:

- 5.2 Answer the following questions by studying your bar graph and the FDI.
- On which days was there danger of flames higher than 10 metres?
 - What colour is used to indicate it?
 - On which days will it be safe to make a fire?
 - What would be the colour index for that?
 - How would you explain the danger rating for Wednesday?
 - Will it be possible for people with wet sacks to extinguish a fire if the flames are 5 to 15 metres or more in height? Explain your answer.
 - Why is fire such a hazard in August?
 - On Thursday a group of workers started making arrangements for controlled burning. Do you think they are doing the right thing? Explain your answer.
 - What is the speed at which the fire can spread on a red day?
 - Which fuels could burn on a red day? Study all the information to make a list.

ECONOMIC & MANAGEMENT SCIENCES

ACTIVITY 1

Context: The consequences of fire in the economic cycle of a forestry company and community.



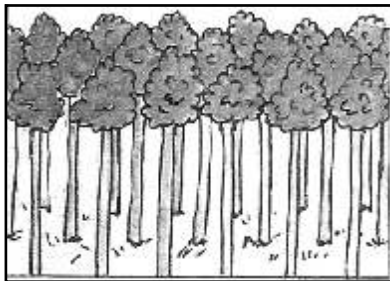
THE CYCLE OF TREE PRODUCTION

In order to have the products of forestry, a whole cycle must be completed. This cycle can sometimes take up to 20 years.

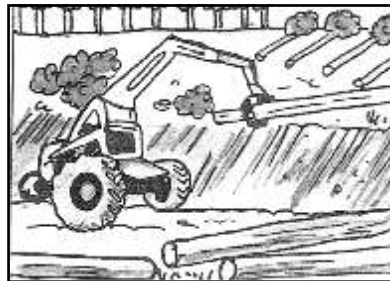
ACTIVITY 1.1.

- ⑥ Read about the various stages of the tree cycle. (Sentences 1 to 6)
 - ⑥ Match the pictures below (A - F) to these sentences.
 - ⑥ Write down the numbers of sentences, with the letter of the picture next to it.
1. Seedling being carefully grown in trays in protected area.
 2. Small plant being planted in prepared soil.
 3. Young trees.
 4. Ten years from first planting trees, they reach full height.
 5. Trees are harvested.
 6. Timber from trees is sold to industries for use in creating jobs and the manufacture of various items.

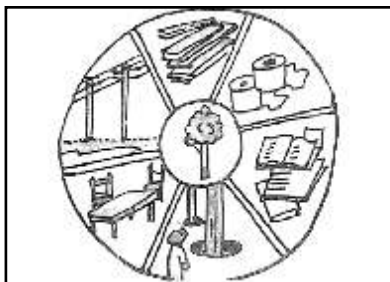
A)



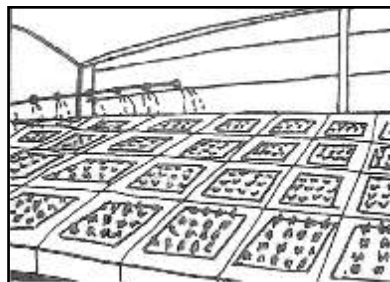
D)



B)



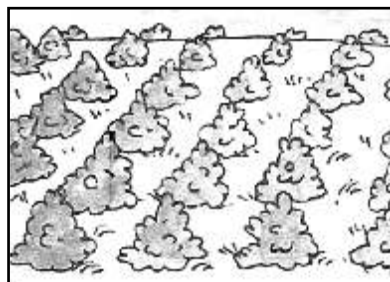
E)



C)



F)



ACTIVITY 1.2

- ⑥ Answer the following questions based on the tree cycle in your work books.
 - ⑥ You must also study the information for ACTIVITY 2 to complete this activity.
(A full-grown tree . . .)
 - ⑥ Make sure you number your answers correctly.
-
1. It takes many years for the cycle to be completed. These trees are grown because we have needs. Name the products needed by consumers and name some of the products that are made from the trees.
 2. Which trees can give us these products: Trees in picture A, or trees in picture F. ?
 3. Which jobs are offered to people in pictures C and E?
 4. Which jobs are created when the trees are harvested?
 5. Which equipment or machines are used in the harvesting process?
 6. If a fire destroys the trees in picture F, would they be ready to be harvested at the end of their growth cycle?
 7. Study all the steps these trees have passed through and consider for how many years people had to be employed and paid. This will be money which will go up in flames if a fire destroys these trees. Will the forestry company get any money for all the steps up to this stage F?
 8. Will there still be jobs for the people who had to care for these trees; such as removing weeds, protecting the trees from grazing by cattle, protecting the trees from fire?
 9. Will any timber be harvested or any products made from these trees if they are burnt?
 10. Will this have a positive or negative impact on the community?
 11. Will the forestry company make a profit or suffer a loss as a result of this fire?
 12. Will the company be able to grow, become bigger and stronger, offer more jobs, if there are no trees to harvest?
 13. If the growth cycle of the tree is broken before it gets to a mature tree, what must the company do? E.g. Start right at the beginning by planting seeds, or will it be better to wait till the ten years have passed and then start with seeds again? Give a reason for your answer.
 14. How many years, do you think will be wasted if the mature trees are burned down before they could be harvested?

ACTIVITY 2

The cycle of product and payment.

- ⑥ It must be stated clearly that the product required in forest management is:

A FULL-GROWN TREE

Anything less than this is not going to create employment, either in the forest or in the industry that the wood from the trees is supplied to. Trees are valuable and should be cared for at all stages of growth.

THE TREE CYCLE

Step in tree cycle	Action: When and what employment is required	Payment takes place for employees' actions.
1. Seedlings	Care Transport	Employees on contract take care of seedlings, by watering and sheltering them in sheds.
2. Soil and land preparation.	Suitable land is selected. Soil is prepared.	Forestry company employs contractor. Contractor employs labour. Labourers prepare land using tools, tractors – managed and guided by contractor.
3. Planting	Trays of small plants are carefully stacked on trailers and taken to previously prepared land	Labourers, employed by contractor, carefully plant trees.
4. Growth process to small trees Growth process to medium size young trees	Weeding by hand. Weeding chemically. Weeding mechanically. Controlling noxious weeds.	Manual labour. Machine and labourers Labour
5. Growth process to mature tall trees	Protect from fire	Good quality tree produced.
6. Harvesting of mature trees.	Harvest to required specification.	Supply to order.

ACTIVITY 2.1

- ⑥ Study the cycle above.
- ⑥ The economic cycle also includes the flow of money. In this case money is flowing into the households of people employed for each step in the tree cycle.
- ⑥ Work in groups of 6.
- ⑥ Count from 1 to 6 and each team member receives a number.
- ⑥ Your number now correlates with the step in the tree cycle.
- ⑥ You are employed on that item. Imagine you are working for the forestry company.
- ⑥ Describe to the rest of the group which role you play in the delivery of tree products to fulfill consumer needs and wants. What will you be paid for?
- ⑥ Think of what will happen to the cycle if you do not do your job properly.
- ⑥ What will be the long-term result of your irresponsibility?

ACTIVITY 2.2

- ⑥ After receiving payment, you go home with the wage you have earned.
- ⑥ You are the head of the household.
- ⑥ Make a list of all the expenses you will have to cover with this wage.
- ⑥ Decide what you are going to save.
- ⑥ This list will show the needs and wants of your own family.
- ⑥ What are needs?
- ⑥ What are wants?
- ⑥ Your teacher will give you more information on personal budgeting.

In this activity you will discover how important it is to draw up a budget.

ACTIVITY 2.3

RUBRIC FOR ACTIVITY 2.6 COULD BE USED FOR ASSESSMENT.

- ⑥ In your groups you must discuss the following scenario.
SCENARIO:
A devastating wild fire breaks out in a forest of mature trees.
Who are the people who will be directly affected by it?
Will other people also be affected?
- ⑥ Discuss in your groups how this fire will impact on each step in the tree cycle.
- ⑥ Study the following pictures and information to assist you with this activity.
Some of them are positive and others are negative.
Can you tell which are good pictures and which pictures show something which is bad?
- ⑥ Report back to the whole class in a presentation.

Forest fire caused by neglect or intentional arson.

Umlilo ubangelwa ngamabomu noma owenzeke ngokunganaki.



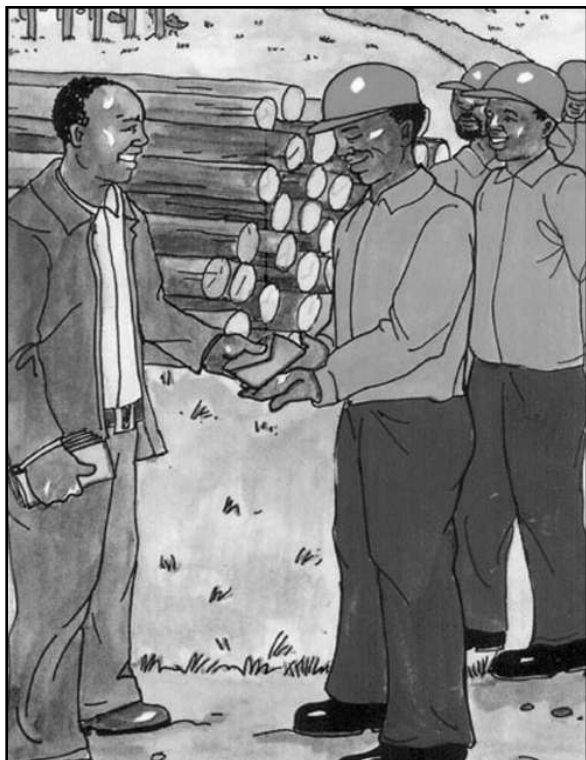
Labour employed - cutting trees with chainsaw

Abaqashwa banquma izihlahla ngamasagaUmlilo ubangelwa ngamabomu noma owenzeke ngokunganaki.



Contractor paying the contracted labourer for work done.

Umqashi ukhokhela abasebenzi amaholo abo.



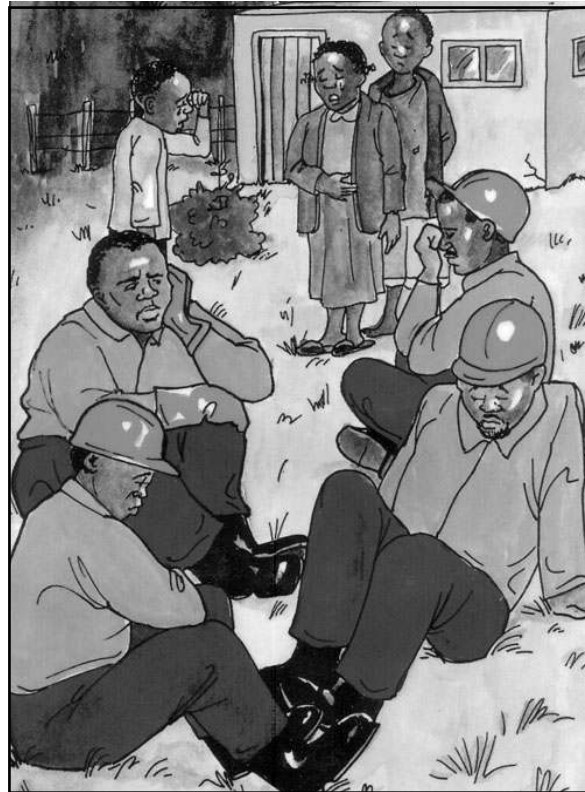
Person intentionally lighting fire / person smoking out bees resulting in fire being caused.

Umntu ulayitha / uthungela umlilo ngamasibomu / ngenhloso umuntu uvuthela izinyosi ngentuthu yomlilo okuphumela ekusheni kwehlathi.



Forest has been damaged. There can be no harvesting of this plantation. Community suffering because of no work.

Ihlathi lilimele lacekeleka phansi. Lelihlathi angeke lisavuneka umphakathi usozothwala kanzima ngoba umsebenzi alusatholakali.



Firefighters working hard to extinguish flames.

Umsebenzi wakwa noma wenkontileka ucisha amalangabi omlilo.



An employee inspecting the damage to the plantation. He is worried because of the destruction of trees and the fact that there will be no work now..

Umsebenzi we mahlathi uhlola ihlathi ngemuva komlilo osulimaze ihlathi Ukhathazekile ngokonakala kwelezi hlahla ngoba lokhu kusho ukuncipha kwamathuba omsebenzi.



Adult men - sitting talking - small trees in the background - no work. Planning small business ideas for this time of season.

Umsebenzi we mahlathi uhlola ihlathi ngemuva komlilo osulimaze ihlathi Ukhathazekile ngokonakala kwelezi hlahla ngoba lokhu kusho ukuncipha kwamathuba omsebenzi.



Forest company personnel telling buyer of poles, that there are no poles to buy because there have been fires.

Boso Mahlathi batshela abantu abazothenga izingodo ukuthi azikhho ngoba kube nomlilo omkhulu oshise ihlathi lonke.



ACTIVITY 2.4

- ⑥ Carefully read through the following news article that appeared in a local newspaper.

FIRE CAUSED R 100 MILLION DAMAGE

NELSPRUIT

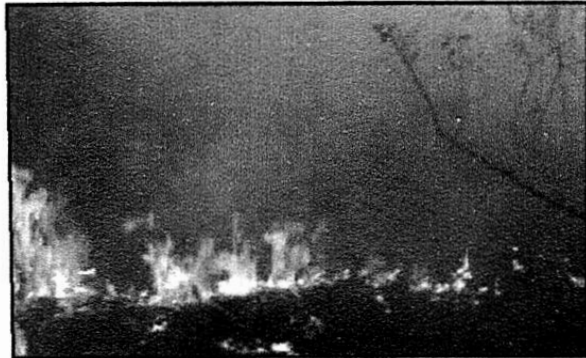
In 2001, veld fires damaged about 30 000 hectares of plantation and grazing in Mpumalanga, causing an estimated R 100 million damage. Fire fighters spent days fighting the fire, and made use of helicopters and aeroplanes to put out the fire.

The effect of the fire will be felt for the next 15 years, by paper, wood and other industries. People and businesses suffered great losses.

In a letter to the premier of the province, a business man said that the damage that

was caused by the fire could have a very negative impact on business in the region (economic impact). Because the fire destroyed the raw materials, like timber, businesses could not manufacture timber products. This means that they had no products to sell, and could not afford to employ people.

The premier instructed the police to find out who had started the fire. The damage caused by the fire was so great, that the government declared Mpumalanga a disaster area.



The government sent food and blankets to the people whose homes burnt down. Rural farmers lost a lot of their livestock, which died

in the fire. (social impact) Big industries like Sappi and Mondi lost many hectares of valuable timber.

ACTIVITY 2.5

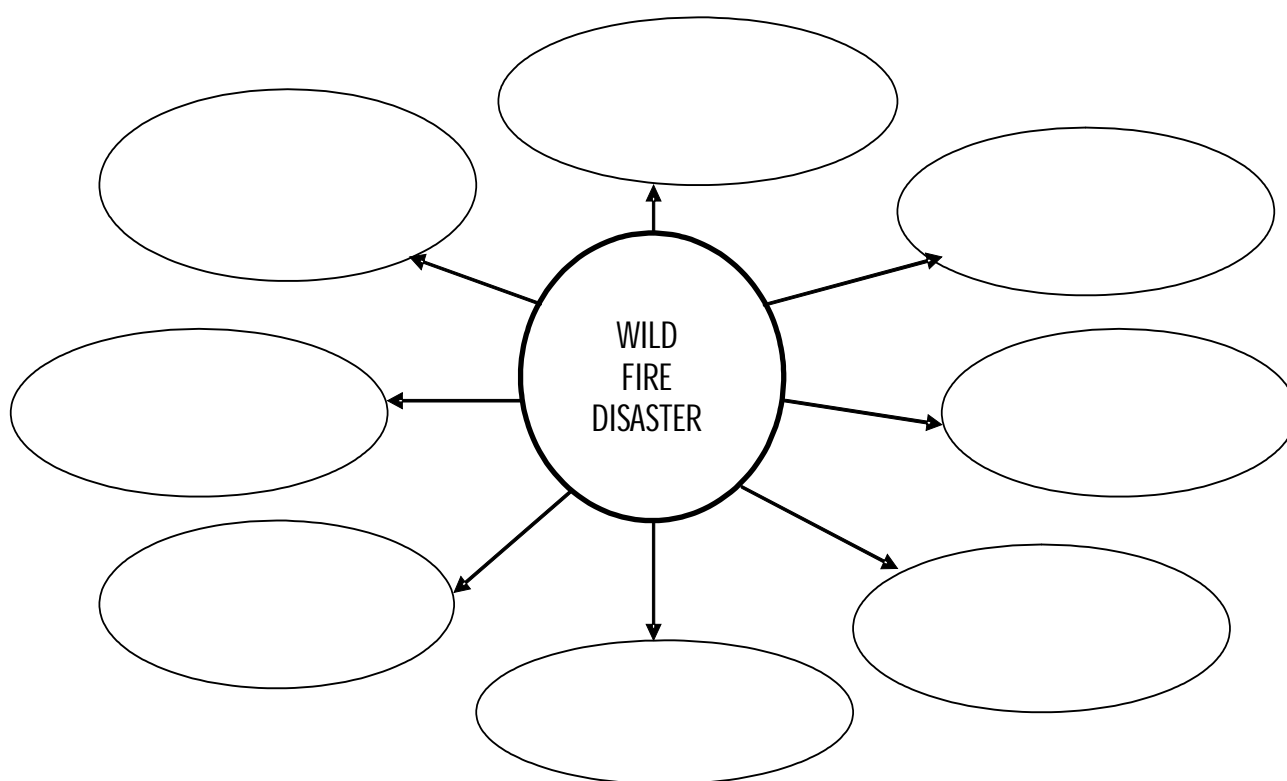
- ⑥ Using a copy of the newspaper article in the Activity 2.4, carefully UNDERLINE sentences and parts of sentences that inform us on the following aspects in the article:

- parts of sentences referring to damage done.
- money lost.
- how the fire was combated.
- the time it will take to recover.
- the industries which will be affected.
- the effect on business.
- the effect on employment.
- how people who lost their homes were helped.
- What is a disaster area?
- Accountability:

What consequences should there be for the person responsible for the fire disaster?

ACTIVITY 2.6

- ⑥ Construct a mind map like the one below, on which you indicate the key issues you have underlined in the previous activity.
- ⑥ Use this mind map in an oral presentation, pointing out the economic effects of the wild fire disaster. Your teacher will assess your presentation, using the rubric below.
- ⑥ Hint: You could write the aspects you want to cover on flash cards, and add them during your presentation or collect pictures from newspapers to aid or enhance your presentation.



ACTIVITY 2.6 RUBRIC

Assessment criteria	Level 1	Level 2	Level 3	Level 4
Audibility & clarity	Barely audible and impossible to understand.	Some points missed due to poor audibility and/or little clarity.	Presentation was audible and contained most all points with clarity.	Presentation was audible, contained all points and demonstrated creativity and comprehensive understanding.
Use of language	Language is inappropriate and confusing.	Language is not always clear.	Use of language was satisfactory.	Impressive use of language in presentation.
Use of mind map or other visual aids.	No mind map or other visual aids are used.	Mind map information or visual aids are poorly chosen and distract from the presentation.	Mind map and/or visual aids are used to complement the presentation.	Mind map or visual aids are carefully chosen and skillfully used to enhance the presentation.

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