PROVINCE OF THE EASTERN CAPE

DEPARTMENT OF EDUCATION

NATURAL SCIENCES

EXEMPLARS OF LESSON ACTIVITIES

INTERMEDIATE & SENIOR PHASE (GRADES 4-9)

MARCH 2009

INTRODUCTION

The Eastern Cape Department of Education, Curriculum Chief Directorate in collaboration with the District Curriculum Personnel developed the lesson plans in this document to support teachers in their daily preparation to teach Natural Sciences.

This ***Natural Sciences Exemplars of Teaching and Learning Activities*** document contains a series of suggested activities that could be used by the teachers in their daily preparations to teach Natural Sciences. It serves to support the teachers in their planning process and lesson preparations. These activities are just few examples of activities which can be used in daily teaching.

This document is a continuation of the document that was developed in November 2008 - ***Provincial Natural Sciences Resource Document for Planning, Teaching and Assessment.***

This document must be used together with the National Curriculum Statement, National Assessment Guidelines document, Provincial Assessment Guidelines document, Work Schedules and the Provincial Natural Sciences Resource Document for Planning, Teaching and Assessment.

The activities/lessons must be adapted to suit the particular needs of the learners by including additional activities, assessment details and tools for assessment.

This document in no way is not prescriptive or final nor does it replace any other document / textbooks that are available for teaching. Teachers are encouraged to use this document as a resource together with a variety of available textbooks. The document does not in any way suggest that only the topics included in the document are to be taught in the various grades. Always follow the NCS policy for the Learning Area.

Natural Sciences Learning Area has about 2Hrs and 30 minutes per week, according to policy and teachers are advised to follow the activities according to time allocation.

Note to teachers:

- Each Lesson Plan consists of a number of Activities.
- The time allocation for activities is indicated.
- These are suggested activities, use as guidelines, together with your work schedule.
- Feel free to adapt these activities.
- Choose activities that you think are very relevant.
- Pay attention to progression when dealing with same content in different grades.
- Choose available resources that suit your context.
- Make additions wherever necessary.
- Give class works and home works regularly.
- Vary the methods of assessments.
- Give time to learners to write notes on new content.
- Give short tests as part of informal assessment regularly.
- Demonstrate practical activities and allow learners to take part in the activity.
- Give more credit to hands-on activities.
- Keep evidence of all daily classroom activities.
- Use different textbooks for content and as references.

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SUGGESTED TEACHING AND LEARNING ACTIVITIES FOR NATURAL SCIENCES: INTERMEDIATE PHASE

GRADE: 4

LEARNING OUTCOMES AND ASSESSMENT STANDARDS:

LO 1. Scientific Investigations: *The learner will be able to act confidently on curiosity about natural phenomena, and to investigate relationships and solve problems in scientific, technological and environmental contexts.*

AS 1. Plans Investigation;
2. Conducts investigation and collects data;
3. Evaluates data and communicate findings.

LO 2. Constructing Science Knowledge: *The learner will know and be able to interpret and apply scientific, technological and environmental knowledge.*

AS 1. Recalls meaningful information;
2. Categorises information.

LO 3 Science, Society and Environment: *The learner will be able to demonstrate an understanding of the interrelationships between science and technology, society and the environment.*

AS 1. Understands science and technology in the context of history and indigenous knowledge;
2. Understands the impact of science and technology.

TERM-1 WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
WEEKS: 1-4	**TOPICS: 1. WATER IN THE ECOSYSTEM** **2. PHASES OF MATTER** (please refer to the Natural Sciences Resource Document of November 2008)	Assessment Task 1-the different states of matter(refer NS resource document)	(refer NS resource document)
WEEKS: 5-6	**LIFE AND LIVING** **TOPIC: LIVING THINGS(Characteristics)** **LO1: As: 1,2 and 3** **LO2: As: 1and 2** **ACTIVITIES**: • Teacher uses pictures, charts and specimens to name the characteristics of living things. • Learners recall some of the features of animals and plants. • Learners take a field trip to collect different plants and animals around the school. • Make a list of different plants and animals. • Identify and sort plants and animals according to observable features. • Groups discuss similarities and differences between plants and animals. • Complete tables about similarities and differences. • Teacher summarises the characteristics of plants, animals and make a comparison.	Write characteristics of plants and animals. Written work using tables to sort plants and animals. Make a drawing of a plant and an animal to show the main external features. Write down the similarities and differences between plants and animals.	Books Newspaper Magazines Specimens of plants and animals

WEEK:7	**TOPIC; PARTS OF A PLANT** **LO1: AS 1, 2 and 3** **LO 2: AS 1and 2** **ACTIVITIES:** • Learners recall the characteristics of plant. • Collect small plants, observe and name the parts. • Teacher explains the functions of the different parts of a plant. • Learners identify parts of a plant. • Learners observe a chart showing the parts of a plant and compare it to the real plant that they brought to the class. • Observe different types of plants. e.g. a bean plant, tomato plant, maize plant to compare its parts.	Draw and label the different parts of a plant. Assignment: Write notes on the functions of different parts of a plant.	Real plants, Charts , Pictures

WEEK: 8	**TOPIC: FACTORS AFFECTING PLANT GROWTH** **LO1: AS 1, 2 and 3** **LO2: AS 1and 2** **ACTIVITIES**: • Teacher asks questions related to plant growth: e.g. have you planted any plants? How do plants grow in your garden? • Ask learners to grow a plant from a seed and observe the root, stem and leaves. • Ask learners to place some beans seed in wet soil and some in dry soil for 7-10 days and observe what happens to the seeds. Explain the changes happened to the seeds. • Ask learners to keep some seeds in a wet tray outside and some in a wet tray in a fridge for 7 – 10 days and make observations about the changes that happened to the seeds. • Ask learners to place a pot plant on the window seal and one in the cupboard and observe what happens after a few days. • Teacher explains factors that affect the growth of the plant e.g. water, sunlight, soil and air.	Completion of worksheet on investigation of the factors that affect plant growth.	Seeds, water, soil, tray, sand, real plant charts, pictures

WEEK:9-10	**TOPIC: ACCESS TO CLEAN WATER FOR ALL** **LO 1: AS 1, 2 and 3** **LO 3 AS: 1 and 2** **ACTIVITIES:** • Discuss ways in which the learners get water in their homes. • Arrange a visit to the nearby dam/river and collect data on how the community gets the water for their daily use. • Investigates water use using audits. • Explore issues of access to water. • Think critically about the use of water by their families and their community. • Discuss the importance of having clean water in the community and how to keep the water clean in dams and rivers. • Teacher explains the cause of water born diseases and how to prevent them. (e.g. Cholera in Limpopo Province). • Make community aware of the need to have clean water and the rights and responsibilities to access clean water by making flyers/posters and through debates.	Assignment: Write a paragraph on the importance of clean water in the community and ways to keep the water clean in dams and rivers. Assignment: Describes how own cultural group has, through history, found safe ways to collect and use water to drink. Suggests why having running water in a home might make people's lives easier. Suggest ways to reduce water pollution.	Newspapers magazines, TV, radio, community, Internet, books

TERM-2 WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
WEEK: 1	**ENERGY AND CHANGE** **TOPIC: ENERGY** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES**: • Teacher discusses the concept energy (ability to do work) gives examples, how we get energy from various sources. • Learners list different types of energy e.g. heat, light, sound. • Teacher explains how energy can be generated. Give simple examples from everyday life situations. • Make a list of different sources of energy e.g. sun, wind and fire.	Assignment: Written work on definition, types and sources of energy.	Charts with sources and different types of energy
WEEK:2	**LIFE AND LIVING** **TOPIC: SUN AS A SOURCE OF ENERGY** **LO1: AS 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES**: • Teacher explains the importance of the sun as a source of energy for all living things. • Learners state the role of the sun. • Discuss how animals get energy from food (cannot make their own food instead they are dependent on plants for food). • Learners observe the plants which are placed in different places. E.g. in sunlight and in dark place.	Practical activity-observe damp clothes of different material drying on a sunny day (record their observations). Investigate the importance of sun as a source of energy for plants.(two different plants, one plant placed in a dark cupboard and the other in a sunny position).	Clothes, water, plants

Weeks: 3-4	**TOPIC: FEEDING HABITS OF DIFFERENT ANIMALS** (Herbivores, carnivores and omnivores) **LO1: ASs 1,2 and 3** **LO2: AS 1 and 2** **LO3: AS 2** **ACTIVITIES**: • Teacher uses pictures of various animals (herbivores, carnivores and omnivores) and discusses what they eat. • Ask learners to group them according to what they eat. • Introduce terms like: herbivores, carnivores and omnivores and give examples in each group. (ask learners to find the meaning of the words from dictionary) • Learners are asked to collect information about one herbivore, carnivore and omnivore (their main food and how and where they find their food, etc.) • Write a paragraph on each animal and present it to the class.	Make a chart with pictures of herbivores, carnivores and omnivores. Assignment on three different groups of animals.	Charts/pictures of animals and real animals, books, magazines, textbooks, Internet etc

Week: 5-6	**TOPIC: BALANCED DIET** **LO 1: AS 1 and 2** **LO2: AS1 and 2** **LO3: AS1and 2** **ACTIVITIES:** • Learners discuss the different types of food they eat. • Teacher explains the different types of food and food groups. • Teacher explains the meaning of balanced diet and gives the name of different categories of food. • Learners are asked to collect information on the different types of food eaten by different families. • Learners present their information. • Categorises the food types carbohydrates, proteins, fats, minerals and vitamins. • Make a poster of different food types using food labels from supermarkets. • Brief explanation of a balanced diet. (food with all the types of nutrients in correct quantities/ proportions) • Discuss the need for healthy living choosing healthy food habits.	Investigate the different types of food eaten by different family members for a week from 5 different households. Written work on balanced diet, types and groups of food (chart).	Posters, Charts with different types of food, real foods, food labels from cans, packets, boxes etc.

Week:7-9	**PLANET EARTH AND BEYOND** **TOPIC: SOLAR SYSTEM.** **LO1: AS: 1, 2 and 3** **LO2: AS 1 and 2** **LO3: AS 1 and 2** **ACTIVITIES**: • Discuss about the stars, sun, moon, earth etc. and their views during day and night as well as their movements to give the learners an idea about planets and the solar system. • Learners identify the planets in the solar system using charts and models and identify earth as a planet in the solar system. • Teacher makes use of charts to identify the different positions of planets and explains inner and outer planets • Write down the names of the planets. • Learners draw the solar system labelling the different planets. • Teacher discusses-what makes the day and night? Uses the globe (rotation of the earth on its own axis as it circles the sun, sun as the centre of the solar system).	Identify and name planets in the solar system. Draw / make the model of the solar system. Short test to assess factual information.	Charts, models, globe, pictures, text books.

Week: 10	**TOPIC: MOON AND ITS SHAPE** **LO1: AS: 1, 2 and 3** **LO2: AS 1 and 2** **LO3: AS 1 and 2** **ACTIVITIES**: • Teacher explains the phases of the moon by showing the different shapes of moon in a drawing/chart and learners identify the shapes of the moon on the charts and record findings. • Learners investigate the different changes of the moon over a period of seven nights or more. • They record and draw the changes of the moon e.g. quarter, half and full. • Investigates the relationship between appearance of moon and tides. • Discuss the cultural/ religious beliefs related to the appearance of moon, stars, etc.	Written presentation of the observation of moon over a period of time. Presentation of drawings of the shapes of the moon.	Charts with the different shapes of the moon, models, globe, notes on high and low tides

TERM 3 WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week:1-5	**LIFE AND LIVING** **TOPIC: VEGETATIVE REPRODUCTION** **LO1: AS 1, 2& 3** **LO2: AS 1& 2** **LO3: AS 1& 2** **ACTIVITIES:** • Learners brainstorm in groups on how new plants are grown.(e.g. potato, onion, maize, spinach, roses and other local examples) • Teacher introduces the concept (vegetative/asexual reproduction) with the use of charts/ plants, e.g. rhizomes, tuber, bulb, etc. • Discuss examples of vegetative reproduction- investigate how the onion bulb grows and present their findings. • Compare the development of an onion bulb with other plants like a potato, new grass and a strawberry. • Learners draw and label parts of a plant e.g. roots, leaves and stem. • Learners do a practical work on different ways of growing plants e.g. Place plant cuttings in a glass of water and observe them over a period of time, record their findings and make drawings. • Teacher further explains (using examples of plants) that vegetative reproduction can also be done by using roots and leaves. • Discuss the importance of vegetative reproduction.	Research on different types of plants growing from different parts of the plant and write a report on the uses of these plants, make drawings of cuttings etc, bring actual plant parts and make a presentation on your findings. Practical work- follows instructions.	Charts with growing plants Real plants parts Charts, pictures Real plants- cuttings, tubers, bulbs etc Charts with growing plants.

Week: 6-8	**ENERGY AND CHANGE** **TOPIC: TEMPORARY AND PERMANENT CHANGES TO MATERIALS** **LO1: AS 1, 2 and 3** **LO2: AS 1 and 2** **LO3: AS 1 and 2** **ACTIVITIES:** • Teacher uses materials like ice, water, sugar, paper etc to introduce the concepts of temporary and permanent changes to materials. • Learners observe ice cubes and see how it changes to water. • Teacher explains melting, evaporation and condensation. Demonstrate simple experiments. • Teacher demonstrates temporary change and permanent change (by heating a piece of copper wire, burning paper/burning wood etc). • Teacher gives other examples of changes and learners categorise them according to permanent and temporary changes.	Written work on examples and categories of temporary and permanent changes to materials. Practical work on permanent and temporary changes to materials. Complete table showing permanent and temporary changes to materials. Class test	Ice, wire, wood, glass, spirit lamp, candle, paper, salt, plastic and matches.

TERM :4 WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Weeks1-2	**LIFE AND LIVING** **TOPIC: DIFFERENT HABITATS OF ANIMALS** **LO1: AS:1, 2 and 3** **LO2: AS:1& 2** **LO3: AS: 1** **ACTIVITIES:** • Teacher asks learners to give examples of domestic and wild animals and the places where they live and what do they need in order to live(shelter, food, air and water) • Teacher explains the concept 'habitat' • Take a field trip to research about habitats of different animals e.g. ant, termite, butterfly, locusts, cows, birds, lizards, etc. • Learners record their observations in the worksheet-name of an animal, its habitat, how the habitat looks like, how the animal looks like, what it eats, its shelter etc. • Visit to zoos, forest, beach, etc. to learn more about different habitats and the way animals live in those habitats.	Research activity on habitats and the feeding habits of different animals. Complete worksheet: List at least 3 animal habitats. Name the 4 needs of all living things. Identify a specific animal's accurate habitat. Create a drawing of the animal in its habitat, labelling its air, water, food, and shelter. Create a story about the animal and/or its habitat including at least 5 sentences. Written report on findings from the visit.	Charts with different animals pictures, school yard.

Week3-4	**VERTEBRATES AND INVERTEBRATES** **LO1: AS:1, 2 and 3** **LO2: AS:1& 2** **LO3: AS: 1** **ACTIVITIES:** • Teacher uses pictures/ specimens to introduce and explain the two main categories of animals (Vertebrates and Invertebrates) • Teacher gives examples of vertebrates and invertebrates and the main features of each. • Learners complete a table and categorise animals in to vertebrates and invertebrates. • Investigates and reports back on the life cycle of an invertebrate. (e.g. butterfly or locust) • Learners are given worksheets to complete, observe the characteristics of two or more animals e.g. name of an animal, body, eyes, legs and movement etc.	Written work on categories of invertebrates and vertebrates. Written work on a worksheet on characteristics of animals.	Books, posters and charts with different animals, live animals Worksheet on characteristics of animals
Weeks-5-6	**PLANET EARTH AND BEYOND** **TOPIC: EARTH** **LO1: AS 1, 2 and 3** **LO2: AS1 and 2** **LO3: AS 1 AND 2** **ACTIVITIES:** • Teacher discusses what earth is made up of?(rocks, soil, water and gases of the atmospheres) • Learners recall the examples of earth materials e.g. soils, solid rocks, water and gases of atmospheres. • Teacher explains weather changes that happens daily and gives descriptions of how it is measured by means of measurable quantities such as temperature, wind direction,	Written work on examples of earth materials Collect data from newspaper, magazines, TV and radio about maximum temperature,	Charts with different types of earth materials Globe Newspaper, magazines, TV, radio

	speed and precipitation. • Teacher explains seasonal changes (in rainfall, average wind direction, length of day or night and average maximum and minimum temperatures. • Learners name the different seasons e.g. summer, winter, spring and autumn and describe the effects on animals, plants and people. • Teacher uses the map of the world to identify the locations of oceans and continents, give names of continents and oceans, learners observe them on the globe.	minimum temperature, cloudy, windy and rainfall patterns and record these data in a table. Written information on locations of oceans and continents. Identify oceans and continents on the map.	Map of the world Globe
Week: 7-8	**ENERGY AND CHANGE** **TOPIC: ENERGY FROM ELECTRICAL SOURCE (ELECTRICTY)** **LO1: AS 1, 2 and 3** **LO2: AS 1& 2** **LO 3: AS 1** **ACTIVITIES:** • Teacher brings cells, bulbs, connecting wires into the classroom to show how a light bulb lights up using electrical energy. (Start with how the torch light works) • Teacher explains an electrical circuit. • Teacher works with learners to do the connection in series and observe what happens. • Teacher explains safety measures when using electricity –use pictures, charts and diagrams.	Written work on electrical circuit. Practical activity-use cells, wires and bulbs to make an electrical circuit. Draw the circuit diagram.	Charts with information about electricity and precautions on how to avoid danger. Cells, bulbs and connecting wires, torch light

LESSON EXEMPLAR: GRADE 4

Grade: 4 Learning Area: Natural Sciences		**Date: May 2009**
Strand: Earth and Beyond		
Duration: 5 Hrs. Content in context: Earth in Solar system		
Integration: Language LO2: Speaking LO3: Reading LO5: Thinking and reasoning AS: Collects and records information in different ways **Mathematics** LO5: Data Handling Social Sciences: Geography		
Selected LOs and Ass	**Teaching and Learning Activities**	**Details of assessment**
LO 1: SCIENTIFIC INVESTIGATIONS **AS:** Plans investigations: **AS:** Conducts investigations **AS:** Evaluates data and communicates findings **LO2: CONSTRUCTING SCIENCE KNOWLEDGE:** **AS:** Recalls meaningful information: **AS:** Interprets information: **L O 3: SCIENCE, SOCIETY AND THE ENVIRONMENT** **AS:** Understands science and	**Activity:1** Teacher uses a chart to show the different layers of planet earth e.g. outer and inner layers. Name the different layers of planet earth. Teacher asks questions e.g. what is the earth made up of? (rock, soil, water and atmosphere) **Activity: 2** Teacher explains oceans, seas, rivers etc as part of the earth. **Activity: 3** Formation of day and night- Teacher uses a globe /charts and diagrams to discuss the movement of the moon and earth. Explain the formation of day and night using globe or a ball and a candle. **Activity:4 Moon and its shape** Teacher asks questions about different objects that can be observed in the sky. E.g. birds, clouds, aeroplanes, sun, stars and the moon.	Write a paragraph on the different layers of planet earth- earth materials and formation of day and night A table with the dates and the shapes of the moon correctly drawn. Assessment - ability to follow

technology in the context of history and indigenous knowledge.	• Explains that all the objects named above have properties, locations and the movements that can be investigated. • Explains that the shape of the moon changes each night • Learners are asked to observe the shape of the moon for seven nights. Learners will make drawings of the shapes that they observe each night and record the dates. **Actvity:5** Learners present their report on a poster showing the changes that happened to the moon during their seven days observation.	instructions Poster presentation assessed by a rubric
Resources: Charts showing the shapes of moon, globes, magazines, newspaper etc		
EXPANDED OPPORTUNITY Use newspaper and other articles to find out more about earth and moon.	**Teacher Reflection** Teachers will note • How the lesson plan could have been presented differently • What impacts on practical done • Other examples that may have been used • What was good/weak about the lesson • Concepts that have not been dealt with effectively	

ASSESSMENT TASK: 2 ASSIGNMENT—EARTH IN SOLAR SYSTEM

LEARNING OUTCOMES:

LO1: SCIENTIFIC INVESTIGATION

ASS: Plans investigation

ASS: Conducts investigations and collects data

ASS: Evaluates data and communicates findings

LO2: CONSTRUCTING SCIENCE KNOWLEDGE

ASS: Recalls meaningful information

ASS: Categorise information

LO3: SCIENCE SOCIETY AND ENVIRONMENT

ASS: Understanding science and technology in the context of history and indigenous knowledge.

ACTIVITY 1: **Assignment**

Written work on different layers of planet earth, earth materials, formation of day and night.

ACTIVITY 2

TRANSLATION-Learners observe changes of the moon per night.

Record the findings on the tables- with dates and shapes of the moon.

Draw the shapes of the moon per night.

ACTIVITY 3 –PRESENTATION

Poster presentation of their findings

RUBRIC TO ASSESS POSTER

CRITERIA	**LEVEL 1**	**LEVEL 2**	**LEVEL 3**	**LEVEL4**
1. Presentation	Presentation skill lacking	Need improvement	Good presentation skill	Very good presentation skill
2. Labelling	Poorly drawn and incorrectly labelled	Fairly drawn and incorrectly labelled	Drawn and incompletely labelled	Well drawn and correctly labelled completely
3. Colour	No colouring	Partly coloured	Good colouring	Excellent colouring
4. Size	Too small and meaningless	Small but needs improvement	Reasonable size	Big and clear
5. Neatness	Drawn but untidy	Partly neat	Neat	Very neatly drawn

PROPOSED TEACHING AND LEARNING ACTIVITIES FOR NATURAL SCIENCES

GRADE: 5

LEARNING OUTCOMES AND ASSESSMENT STANDARDS:

LO 1. Scientific Investigations: *The learner will be able to act confidently on curiosity about natural phenomena, and to investigate relationships and solve problems in scientific, technological and environmental contexts.*

AS 1. Plans Investigation
2. Conducts investigation and collects data
3. Evaluates data and communicate findings

LO 2. Constructing Science knowledge: *The learner will know and be able to interpret and apply scientific, technological and environmental knowledge.*

AS 1. Recalls meaningful information
2. Categorises information

LO 3 Science, Society and Environment: *The learner will be able to demonstrate an understanding of the interrelationships between science and technology, society and the environment.*

AS 1. Understands science and technology in the context of history and indigenous knowledge
2. Understands the impact of science and technology
3. Recognises bias in science and technology

Term1 WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week:1-4	**TOPICS: 1.ECOSYSTEM** **2. SOLUBILITY** (please refer to the Natural Sciences Resource Document of November 2008)	Assessment Task 1-Investigation (refer NS resource document)	(refer NS resource document)
Week:5	**LIFE AND LIVING** **TOPIC: PRODUCERS, PRIMARY CONSUMERS, SECONDARY CONSUMERS AND DECOMPOSERS.** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES:** • Learners observe insects/birds/cow/sheep/dog etc in and around the school yard and collect information on what they feed on. • Learners group these animals according to their feeding habits into different groups. • Teacher asks learners to match the animals with arrows to show what they eat. • Teacher explains the direction of energy flow from one organism to another (Food chain). • Teacher describes producers, primary consumers, secondary consumers and decomposers using different examples. • Teacher explains: Organisms that use sun's energy to make their food are called producers e.g. grass, algae etc. Organisms that get their food by eating other organisms are called consumers. There are three groups of consumers • Primary consumers – Animals that eat plants	Answer questions on the worksheet: -explain feeding relations/flow of energy. -draw diagrams to show the direction of energy flow. - describe the meaning of producers, primary consumers, secondary consumers and decomposers. Short test Name animals that belong to each category. Draw simple food chains to show energy flow in the ecosystem.	Plants Animals Pictures Charts

	• Secondary consumers – Animals that eat Primary consumers. • Tertiary consumers –Animals that eat secondary consumers. • Learners work in groups to draw a food chain and label the feeding levels.		
Weeks:6-7	**LIFE AND LIVING** **TOPIC: ABIOTIC FACTORS AND ITS EFFECTS ON BIOTIC FACTORS** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES:** • Learners are asked to look around and list all the things that they see. • Learners group these into two categories-living and non-living. • Teacher asks learners to discuss things that are important for normal growth of plants and animals. e. g. air, water, food, etc. • Teacher explains the meaning of abiotic and biotic factors. E.g. air, water, temperature, soil. Biotic factors e.g. plants and animals. Effects of biotic on abiotic- biotic factors dependent on abiotic factors for their survival e.g. plants cannot survive without water. Animals cannot survive without water and air. • Practical work (Experiment): Learners choose two plants and supply one with water and the other without. Make Observations. Then one plant is placed in the Cupboard	Assignment: Describe factors affecting plant growth. Write short notes on biotic and abiotic factors. Make presentations on the observations made.	Plants Animals Pictures Charts

	and the other stand in the Sun. Learners will have to observe the changes that occur in each of the plants over a number of times and record the observations and suggest possible reasons for the observation(s)		
Week:8-10	**ENERGY AND CHANGE** **TOPIC:FORMS OF ENERGY, USES OF ENERGY AND ENERGY TRANSFER** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES:** • Teacher explains and discusses different forms of energy: Heat energy, Light energy, Kinetic energy. • Learners will identify the uses of energy for various purposes such as heating, producing light, movement, etc. • Teacher explains the transfer of energy from one source to another. • Learners predict energy transfer using various sources of energy. Energy is always in transits except for stored energy (potential energy) Heat energy transfers heat etc	Name different types of energy. Practical activity to demonstrate heat energy. This is done by heating water over a flame for some time until it boils. Write down the observations. Written notes on uses of energy. Practical activity to observe heat transfer using different materials: e.g. like an aluminium pot on a hot stove.	Plants Animals Pictures Charts

TERM:2 WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week:1-2	**LIFE AND LIVING** **TOPIC:ADAPTATION OF PLANTSTO VARIOUS CLIMATIC CONDITONS** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES:** • **T**eacher discusses adaptation as the way in which plants and animals live in different environments, ask learners to give examples of plants and animals seen in their immediate environment and how they live. • **Field work:** Learners identify plants that grow in different environments/ climatic condition. (e.g. some plants grow in shaded environments where it is always wet e.g. ferns.) • Learners discuss in groups about the conditions in which these plants grow. • **REPORTING:** Learners list the names of the examples of plants that grow in different environments/climatic conditions and describe why and how they are adapted to those conditions.	Investigate what makes certain plants to have the ability to exist in any particular environment. Design an observation sheet categorised in leaf structure, stem, root system etc. Written work- plants that grow in different environments/ climatic condition. (e.g. some plants grow in shaded environments where it is always wet e.g. ferns	Plants, Text books, Charts, Pictures, Magazines, Internet etc.

Weeks:3-4	**MATTER AND MATERIALS** **TOPIC: PURE AND IMPURE SUBSTANCES** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES**: • Teacher explains and distinguishes between a pure and impure substance. • Discusses ways of separating impurities in substances i • Teacher explains the characteristics of pure substances- melting temperatures and boiling temperatures.	Learners conduct simple investigation on how to separate the impurities of water to make it pure. Written work on pure and impure substances. Completion of worksheet to show different categories of pure and impure substances. Investigate the different ways of purification of water used by local communities.	Books Newspaper Internet Magazines, filter paper, distiller
Week:5-7	**ENERGY AND CHANGE** **TOPIC: SYSTEMS WHICH STORE ENERGY** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES:** • Teacher revises the concepts related to energy : - Energy as ability to do work (Sources of energy by asking questions - where do we get energy from?	**Practical Activity** Learners conduct an experiment to investigate the kinds of energy that exists in that system (e.g. connecting cells, conductors and a bulb to form light) **Presentation activity:** Learners report by naming the kinds of energy they identified in	Connecting cells, conductors and a bulb

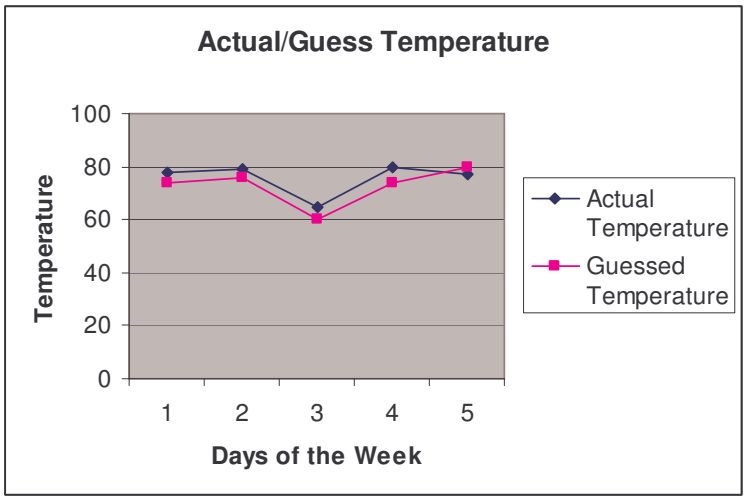
	- Do we need energy? What are the different types of energy? - The different forms of energy (with suitable examples) - Potential energy and Kinetic energy. • Teacher demonstrates and discusses how one type of energy changes to another- transfer of energy by showing simple experiments. • **Practical activity**: Learners conduct an experiment to investigate the kinds of energy that exists in an electrical cell. (e. g. connecting cells, conductors and a bulb to get light). • Learners report their observations. • Teacher explains the energy transfer taking place in the circuit. • Teacher explains the different systems that store energy - Potential energy because of height - Chemical potential energy stored in substances like food, petrol, wood (fuels).	the above practical activity and the transfer of energy. Written work on systems which store energy.	
Week: 8-10	**EARTH AND BEYOND** **TOPIC: ANNUAL SEASONAL CHANGES LIKE CHANGES IN RAINFALL, AVERAGE WIND DIRECTION- WINDMILL AS A SOURCE OF ENERGY**. **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2**	Description of the different seasons. Debate on different seasons.	Thermometers Electric fan Construction paper

	ACTIVITIES: • Teacher wears a dress suitable for the weather/ or shows a man dressed suitable for a particular weather and discusses the reason for wearing the particular dress with the intention of introducing the weather seasons. • Teacher asks learners to name all the seasons of the year. • Describes each season - the weather patterns - changes in rainfall and changes observable in the environment • Group the learners into 4 groups (according to the weather condition – summer, autumn, winter and spring) and debate each weather season as to why it is the group's favourite. Each learner draws himself/ herself dressed in the clothing indicative of his/ her favourite weather. Learners write a sentence describing what each one is wearing and why it is his/ her favourite. • Discuss the direction of wind during the various seasons • Discussion of using wind to generate energy • Investigation of a windmill as a source of energy. • Learners collect information on how the windmill works. • Make a drawing of a windmill.	Write a paragraph on your favourite season. Drawing of windmill. Drawing of a graph following the instruction.	

- Learner Activity:
  - Complete daily temperature book.
  - Draws a graph using the temperature estimated (guessed) for each day versus the actual temperature.

- Look at the example below and follow teacher's instructions in completing the graph. e.g.

Actual Temperature	Estimated Temperature
78	74
79	76
65	60
80	74
77	80



Teacher's explanation

The annual seasons of the year: is a time of the year with a particular kind of weather. Each season has different effect on plants and animals life. The four seasons of the year are Spring, Autumn, Summer and Winter. Each season has its unique features against each other in terms of rainfall/ climatic conditions, etc.

Term:3 WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week: 1-2	**LIFE AND LIVING** **TOPIC: FOOD RELATIONSHIPS IN THE ECOSYSTEM (FOOD CHAIN AND FOOD WEB)** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES:** • Teacher explains how living organisms depend on each other for food by asking questions: - What do domestic animals (cow, dog, cat, sheep, etc.) - What do birds and insects eat? • Learners discuss how we depend on plants/animals for food. • Learners will embark on an excursion to look at different eco-systems in an environment e.g. pond, dam, stream, school yard, school garden, a maize field, river etc and observe what different types of animals feed on. • Learners report back on their findings. • Teacher asks learners to group the animals that eat grass into one and the meat eating ones into another group and so on. • Teacher explains food chain and food web, draws food chains and food webs using the animals and plants the learners collected. • Learners draw food chains using the information they collected. • Teacher explains food relationships existing in various ecosystems.	Investigating different habitats Completing a worksheet on food chain.	Pictures Charts Models Aquarium

Weeks: 3-4	**MATTER AND MATERIALS** **TOPIC: MIXTURES, ELEMENTS AND COMPOUNDS** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES:** • Learners recall information on pure and impure substances and discuss separation of mixtures • Teacher introduces the concept of mixtures and compounds • Discussion on differences between mixtures and compounds • The teacher uses different substances; heat them to observe changes taking place. E.g. paper, water, wood, iron, magnesium, candle wax etc. • Learners record their observations. • Discussion on elements and compounds with suitable examples. • Teacher explains the formation of compound from elements. Give examples, explains what happened when paper is burnt/ magnesium is burnt. • Learners categorise elements and compounds.	Observe and record findings. Write notes on compounds.	Chemical kit Maize Beans Marbles Coffee Samp Paper Wood Candle wax Magnesium ribbon Iron Pictures
Week:5-6	**ENERGY AND CHANGE.** **TOPIC: SOLAR ENERGY** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES:** • Teacher uses pictures, books, magazines to show how solar energy is used in everyday life and explains how it can be used effectively. • Teacher asks learners to observe what happens when a piece	Collect information on the use of solar energy in different communities.	Work cards Thermometer Glass sheet Metal sheet Plastic sheet A big bowl Water

	of bread on a tin foil is placed in the sun and learners measure the temperature. • Learners list things that work with solar energy in their community and at school. • Explains the use of solar panel to generate energy and to reduce cost of electrical energy. **Making a solar panel** **Group activity:** Divide the class into groups of four. • Ask questions like: Do you remember what happened when you felt the difference between water in the shade and water which had been standing in the sun? • The water standing in the sun became hot. • Let's make a "panel" that can use the sun to heat water. • You will need: a basin like a baking tray, a sheet of black plastic, a sheet of clear plastic or glass, water and a thermometer. Teacher explains how to make a solar panel; learners follow the instructions and complete the task.	Write down the observations. Construction of a solar panel.	

Week: 7-8	**EARTH AND BEYOND** **TOPIC:LENGTH OF DAY AND NIGHT** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES:** • Explains the variation of the length of day and night. • Teacher asks learners to describe the duration (length) of days in summer and winter. • Learners record the time of sun rise and the sun set. (I.e. at what time the sun rise and at what time the sun sets in a particular day). Calculate the number hours between the sunrise and the sunset to determine the length of the day. **TOPIC: AVERAGE, MAXIMUM AND MINIMUM TEMPERATURES**: **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1** • Teacher demonstrates how to measure the temperature. • Learners measure and record the temperatures for 7 days, three times a day, in the morning, at noon and in the evening. • Learners record the temperatures in a table with days and times. • Listen to radio/TV or from newspaper learners' record information on minimum/maximum temperatures. • Teacher explains how to find out average temperatures.	Description of summer and winter days. Recording the time of sun rise and sun set and calculation of the number of hours. Written explanations on temperature variations. Recording of minimum/maximum temperatures in a table. Learners plot a graph and then decide on the minimum and calculate the average temperatures. Short test	Newspaper Pictures TV Books Thermometer

Week:9-10	**EARTH AND BEYOND** **TOPIC: WATER CYCLE**. **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1** **ACTIVITIES:** • Teacher demonstrates the process of water cycle using water, kettle, spoon, flame stove, a round bottom and ice cubes • Boil water in a kettle to demonstrate evaporation process. • Place the round bottomed flask with ice cubes above the kettle. • Observe the outside of the flask. The steam will condense on the outer surface of a round bottom flask containing ice tubes. The condensed vapour will fall back into the basin representing rain.	Drawing of water cycle. Description of the process.	Pictures Thermometer Water Spoon Round bottom flask Kettle Flame Lighter Ice cubes

TERM:4 WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week:1-2	**LIFE AND LIVING** **TOPIC: SENSE ORGANS** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **ACTIVITIES:** • Use charts, pictures and own body to introduce and identify the sense organs. • Teacher asks questions e.g. how do you taste food/smell things/see/feel and hear. • Label different sense organs on the given diagram • Teacher explains the function of each sense organ. **TOPIC: HUMAN REPRODUCTION** **ACTIVITIES:** • Teacher explains human reproduction -the different stages of development of the baby and the stages baby undergoes from birth up to two years, from three years to four years, and five years to six years. • Learners are grouped to brainstorm about the changes that occur in boys and girls between the ages of eleven and fifteen **(**Puberty) • Teacher explains sex organs in both male and female using posters. • Teacher discusses how people get infected with diseases and how these can be prevented. E.g. STDs, HIV and AIDS	Matching each organ with a relevant function. The teacher uses memorandum as a marking tool. Identify sense organs. Explain functions of sense organs. Written notes on the developmental stages of the baby.	Models Charts Pictures

Week:3-4	**MATTER AND MATERIALS** **TOPIC: SEPARATION OF MIXTURES** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES:** • Learners are given different types of mixtures to separate them using their own methods e.g. beans and maize grains, sugar crystals and iron filings, water and paraffin etc • Teacher demonstrates and explains different methods of separations of mixtures e.g. decantation, filtration, distillation and magnetism: - Picking (two solids) - Using magnets (iron powder from sulphur) - Filtering (one solid and one liquid) - Allowing to settle and decant(one solid and one liquid) - Pouring lighter liquid at the top from heavier liquid at the bottom (two liquids like water and oil which do not mix)	Practical task on separation of mixtures	Chemical kit Beans Maize Sugar crystals Iron filings Water Funnel

Week:5-6	**ENERGY AND CHANGE** **TOPIC: SAFETY RULES FOR USING ENERGY SOURCES** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES:** • Teacher explains the dangers associated with using different energy sources e.g. Electricity, coal, paraffin, gas, petrol etc. • Learners collect information about safety measures for using electricity, coal, paraffin, gas, petrol etc. Refer books**,** personnel from Eskom, municipality etc and complete the questionnaire. • Learners make a presentation on the dangers of using energy sources and how can it be used safely.	Write notes on the safety measures to be taken when using different energy sources e.g. Electricity, coal, paraffin, gas, petrol etc.	Picture books Posters, Charts

Week:7-8	**EARTH AND BEYOND** **TOPIC: WEATHERED ROCKS** **LO1: ASs 1, 2 and 3** **LO2: AS 1and 2** **LO 3 AS: 1 and 2** **ACTIVITIES:** • Teacher explains soil formation as a result of weathering of rocks, use samples of rocks. • Learners go out to the near rocky shores and collect different types of weathered rocks and identify observable features of those rocks and reports to the class. • Learners collect different types of soil, observe, feel texture etc • Conduct a practical investigation to find out water retention in different types of soil. • Teacher explains the term water retention. • samples of soil is brought to the class and the learners are required to find out about the composition of soil by pouring the water in the sample of soil in a container, shake, let it settle for a while and observe layers- water, silt, fine sand, coarse sand and stones and pebbles. • Learners discuss the possible properties of soil. • Teacher summarises the features of soil types.	Write down the observations on different samples of soil and make a summary of properties of soil.	Water Different types of rocks and soil samples Bowl Beaker/jar Muddy water Filter paper

LESSON EXEMPLAR		
Grade: 5	**Learning Area: Natural Sciences**	
Strand: Matter and Materials		
Duration: 2 weeks	**Content in context:** Pure substances and impure substances	
Integration: Language, mathematics		
Selected LOs and ASs	**Learning Activities**	**Details of assessment**
LO 1: SCIENTIFIC INVESTIGATIONS **AS:** Plans investigations: **AS:** Conducts investigation and collects data **AS:** Evaluates data and communicates findings **LO2: CONSTRUCTING SCIENCE KNOWLEDGE:** **AS:** Recalls meaningful information: **AS:** Categorizes information: **L O 3: SCIENCE, SOCIETY AND THE ENVIRONMENT** **AS:** Understands science and technology in the context of history and indigenous knowledge.	**Activity: 1** Teacher brings different materials to introduce pure and impure substances, ask learners to identify the substances as pure and impure substances. **Activity:2** Teacher explains pure substance as elements and compounds and describe different ways to separate mixtures Learners distinguish between a pure and impure substance. **Activity:3** Teacher explains: Most substances around us are not pure, but Mixtures. This is true of Solids, liquids and gases. Seawater is a salty solution containing a number of minerals and other substances. Air is a mixture of various gases and water vapour. Combining different substances creates new substances with different properties. **Activity:4** Learners separate mixtures by sorting-physical methods. Learners investigate different ways used by industries to separate mixture.	**Assessment Task:** **ASSIGNMENT** **Practical Activity** Learners make water filter to remove the impurities of water. **Presentation activity** Learners to present the investigation process. **Written work.** Learners will be given a worksheet to complete on categorising pure and impure substances. **ASESSMENT METHODS:** Teacher Peer/Self **ASSESMENT TOOLS** Rubric Memo
Resources: Water, ice, textbook, thermometers, internet access, electric fan, construction paper		

EXPANDED OPPORTUNITY: Take learners to distillation factories, visit laboratories and water treatment plants of the city.	**Teacher Reflection** What improvement to be made for a more successful lesson.

ASSESSMENT TASK FOR TERM 3

PROJECT: Making a solar panel **Duration**: 1week

LO 1: SCIENTIFIC INVESTIGATIONS

AS 1: Planning Investigations

AS 2: Conducting Investigations and collects data

AS 3: Evaluates data and communicates findings

LO 2: CONSTRUCTING SCIENCE KNOWLEDGE

AS1: Recall meaningful information

LO3: SCIENCE, SOCIETY AND THE ENVIROMENT

AS2: Understanding the impact of science and technology

RESOURCES: Basin like a baking tray, a sheet of black plastic, a sheet of clear plastic/glass, water and thermometer.

ACTIVITY 1: Learners brainstorm around the topic "Sources of heat energy" and identify more sources of heat. How energy is obtained in most of our homes. They go on to discuss about alternative sources of energy as well. Assessment is informal at this stage.

ACTIVITY: 2 -Practical Activity

INSTRUCTIONS ON HOW TO MAKE A SOLAR PANEL

The teacher hands out pictures of work cards to help the learners to describe and explain the steps /process that they could make their own solar panel.

- Make your basin black on the inside.
- Stand it on a level surface.
- Pour in cool water until it is almost full.
- Use the thermometer to take the temperature of the water.
- Cover the basin with a sheet of clear plastic.
- Stand the apparatus in a very sunny spot and leave it for an hour or two.
- Remove the sheet of plastic
- Test the temperature of water with the thermometer and note any change or difference
- The leader of each group reports back to the class about the findings of the group.

ACTIVITY 3: Oral Presentation of the above steps

ACTIVITY 4: Assignment
(a)Write down any uses of the solar panel.
(b)Why in a solar panel the inside of the basin is made black?
©What colour of clothing do we normally use in summer time?
(d)Based on your answer in c, what do you think is the reason to wear that colour?

RUBRIC FOR ASSESSING THE TASK

Criteria	**Level 1**	**Level 2**	**Level 3**	**Level 4**
Practical Activity	Did not follow the instructions and no results presented	A minimum attempt is made in following the instruction but not correct procedure	Instructions followed correctly to a large extent and very little that is missing	Done very well, the instructions followed and good results are obtained
Oral Presentation	Confuses everything, Unable to articulate more ideas(Language Problem)	Explanation not clear needs help in language	Use correct language structure and in good command of the content	Written work clearly explains their findings correct content used and good presentation skills.
Assignment	Words not clear, wrong spelling	Unable to explain processes clearly	Well presented ideas, but needs some help in content.	Excellent explanation of events with well researched answers.

SUGGESTED ACTIVITIES FOR TEACHING AND LEARNING NATURAL SCIENCES

GRADE 6

LEARNING OUTCOMES AND ASSESSMENT STANDARDS:

LO 1. Scientific Investigations: *The learner will be able to act confidently on curiosity about natural phenomena, and to investigate relationships and solve problems in scientific, technological and environmental contexts.*

AS 1. Plans Investigation;
2. Conducts investigation and collects data;
3. Evaluates data and communicate findings.

LO 2. Constructing Science knowledge: *The learner will know and be able to interpret and apply scientific, technological and environmental knowledge.*

AS 1. Recalls meaningful information;
2. Categorises information.

LO 3 Science, Society and Environment: *The learner will be able to demonstrate an understanding of the interrelationships between science and technology, society and the environment.*

AS 1. Understands science and technology in the context of history and indigenous knowledge;
2. Understands the impact of science and technology.

TERM: 1 WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Weeks:1-3	**LIFE AND LIVING** **TOPIC: DIFFERENT TYPES OF ECOSYSTEMS** **LO:1 AS: 1&2** **LO: 2, AS:1 & 2** **ACTIVITIES:** • Identify different types of ecosystems in your area e.g. grass land, Karoo, valley bushveld, rocky shore, pond, dams, rivers etc. • Choose two ecosystems describe the area- the type of soil/rocks/water etc, and identify the plants and animals seen in that area. • List importance of these ecosystems; explain how plants and animals are adapted to these ecosystems. • Observe movements of animals in these ecosystem e.g. locust, snail, earthworm, crab • Compare the two ecosystems in terms of biotic and abiotic factors. • Explore the threats that face the grassland ecosystem. • Suggest ways in which communities can conserve the grassland.	Written descriptions on different ecosystems. Comparison of biotic and abiotic factors in two different ecosystems. Short test on the adaptations of animals in the ecosystem.	Books Newspaper Internet magazines

Weeks:4-6	**PLANET EARTH AND BEYOND** **TOPIC: WEATHER IN DIFFERENT PARTS OF THE COUNTRY** **LO: 1 AS: 1 & 2** **LO: 2 AS: 2 & 3** **ACTIVITIES:** • Find information in relation to weather • Record daily weather forecast for a week from various sources • Discuss findings and the causal factors present their findings • Explain different weather forecast according to areas • Examine factors that influence weather in different areas • Tabulate three differences between weather and climate	Interpret daily minimum/maximum temperatures Draw a graph to show the maximum/minimum temperatures for a week.	Books Newspaper Internet Magazines TV
Weeks: 7-8	**TOPICS: EFFECT OF DIFFERENT CLIMATES ON HABITATS** **LO: 3 AS: 1 & 2** **ACTIVITIES:** • Explore different types of climate on the South African Map-wind directions, rainfall, temperatures • Look for the types of plants which have special adaptation to each type of climate, use the map/books/magazines/pictures etc.	Assignment: Tabulate three differences between weather and climate List different types of climate on the African Map. Describe the types of plants which have special adaptation to each type of climate. Describe features that enable organism to survive in various climates. Controlled test	Books Newspaper Internet Magazines Map of the world Internet

Week:9-10	**EARTH AND BEYOND** **TOPIC; SEASONS IN RELATION TO THE ROTATION OF EARTH** **LO: 2 AS: 1, 2 & 3** **LO: 3 AS: 1 & 2** **ACTIVITIES:** • Naming of the four seasons. • Identifying different seasons according to hemispheres. • Find pictures from various sources that show weather in different seasons. • Teacher explains how the tilting of earth result to the changing of seasons.	Write notes on the changes taking place in the different seasons, what people do differently when the season changes. Make drawing of themselves how they dress up for different seasons.	Atlas Map of the world

TERM: 2 WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week:1	**LIFE AND LIVING** **TOPIC: NUTRITION IN ANIMALS** **(Heterotrophs, Carnivores, Omnivores, Herbivores)** **LO 1: AS 1 & 3** **LO 2 :AS 1&2** **ACTIVITIES:** • List and classify animals into primary, secondary and tertiary consumers. • Teacher explains the concepts- Nutrition, autotrophs, and heterotrophs. • Investigate on local examples of autotrophs and heterotrophs and report on their findings.	Write notes on heterotrophs, carnivores, omnivores and herbivores. Compare autotrophs and heterotrophs.	Books Newspaper Internet Magazines Pictures
Week: 2	**TOPICS; SAPROPHYTES AND PARASITES** **LO 1: AS 1 & 3** **LO2 :AS 1&2** **ACTIVITIES:** • Teacher explains the concepts-saprophytes& Parasites. • List examples of saprophytes and discuss their nutrition. • Discuss differences between internal and external parasites. • Identify different parasites found on different animals. • Investigate different examples of external parasites. • Discuss clean healthy living to protect yourself from parasites.	Investigation Learners collect data on different parasites. They discuss the differences between internal and external parasites. They present their findings.	Books Newspaper Internet Magazines Pictures, charts

WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week:3	**MATTER AND MATERIALS** **TOPIC: PHYSICAL CHANGE OF SUBSTANCES (melting and solidification)** **LO 1: AS 1,2 and 3** **LO 2: AS 1, 2 and 3** **LO 3 AS: 1** **ACTIVITIES:** • Learners heat different substances like candle wax, fat. • They observe change of phase/ state and record their findings. Keep ice cubes in a plate and observe. • They present their findings in a worksheet. • Discusses melting and solidification.	Practical investigation- completion of worksheet. Write short notes on melting and solidification.	Books Candle Burner Solid fat Evaporating dish
Week:4	**TOPIC: PHYSICAL CHANGES OF SUBSTANCES (evaporation and condensation)** **LO 1: AS 1, 2 and 3** **LO 2: AS 1, 2 and 3** **LO 3 AS: 1** **ACTIVITIES:** • Learners leave water in a Petri dish and observe changes and record their findings. Place ice cube in a jar and observe the outside of the jar. • They put the lid over the boiling water. • They observe change of phase/ state and record their findings. • They present their findings in a worksheet. • Teacher explains evaporation and condensation.	Practical investigation- observes and record findings on physical changes of substances.	Books Newspaper Ice blocks Glass beaker Burner Lid

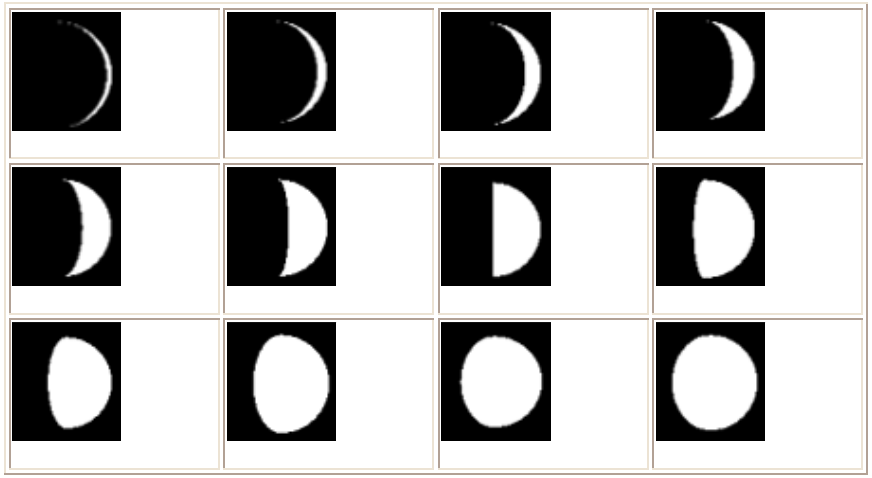
WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week:5-6	**ENERGY AND CHANGE** **TOPIC: TRANSFER OF ENERGY** **LO 1: AS 1, 2, & 3** **LO 2: AS 1, 2 and 3** **LO 3 AS: 1, 2 and 3** **ACTIVITIES:** • Teacher explains and demonstrates what is meant by energy transfer in a circuit. • Teacher discusses good and bad conductors and demonstrates. • Learners sort by experimenting and list good and bad conductors. • Learners investigate how electricity improves the quality of our lives.	Practical Investigation: Collect data that will assist with demonstration of energy transfer from different sources. Visit Eskom, libraries and other relevant sources to investigate the way in which electricity reach our homes. Present their findings and suggest ways in which electricity can be distributed in rural areas.	Battery Switch Light bulb Masking tape Copper wire Bulb holder Measuring tape Boxes plastics

Week:7-8	**ENERGY AND CHANGE** **TOPIC: ELECTRIC CIRCUITS** **LO 1: AS1, 2, & 3,** **LO 2: AS1 &3,** **LO3: AS 1 & 3** **ACTIVITIES:** • Teacher explains the components of an electric circuit. • Learners discuss the differences between conductors and insulators, and test different materials, classify them into conductors and insulators of electricity. • Learners draw and label circuit diagrams • Learners use batteries, wires and bulbs to complete a circuit and observe energy transfer and make drawings of their connections.	Complete the worksheet: 1. Name the different kinds of components that are used to make an electrical circuit. 2. What is the function of a switch in a circuit? 3. What would happen to the bulb in an electric circuit if the wire was cut through at one point in the circuit? Explain why?	Battery Switch Light bulb Masking tape Copper wire Bulb holder Worksheet

WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week: 9-10	**PLANET EARTH AND BEYOND** **TOPIC: MOON AND STARS** **LO 1 AS: 1, 2, and 3** **LO 2 AS: 1,2, 3** **LO 3: AS 1, 2 and 3** **ACTIVITIES:** • Teacher explains different shapes of the moon • They discuss phases of the Moon and the origin of the Moon • Investigate the cultural beliefs around the shape and position of moon and the scientific explanations • Teacher explains different stars. • Learners look for the different colours of stars. • Learner's lookout for patterns of the stars in the night sky. • Learners draw different patterns • Research about cultural beliefs around stars, ask elders and traditional leaders. • Find out how stars are used in the past for navigation and for calendars • Report on the findings in a written presentation.	**Record observations**: Learners watch the moon for seven nights and find the picture which looks most like the Moon each night. Write the date next to that picture on the attachment provided. **Research Project**: Learners conduct a research on different stars and their cultural significance. E.g. Morning star, Early evening star, falling star, winter star (15 June), star with tail.	Books Newspapers Charts, models, globes etc

The Changing Moon

The part of the moon which we see changes its shape each night.
Watch the moon for seven nights or more.
Find the picture which looks most like the Moon each night. Write the date next to that picture.



TERM: 3 WEEKS	TEACHING AND ACTIVITIES	ASSESSMENT	RESOURCES
Week:1-2	**LIFE AND LIVING** **TOPIC: HUMAN DIGESTIVE SYSTEM** **LO 1 : AS 1, 2, & 3** **LO 2 :AS 1 & 2** **ACTIVITIES:** • Learners identify parts of the digestive system on the chart. • Make a labelled drawing of the digestive system. • Teacher explains the functions of each organ. • Teacher mentions where the process of digestion takes place.	**Written work:** Learners write notes on the parts of digestive system. **Project:** Learners keep a diary of what they eat on a daily basis for a week. Analyse the diet according to the nutrients it has. Draw a pie chart to show the percentages of different nutrients. Make a presentation of whether they are eating a healthy diet or not.	Books Flip chart Koki pens Models of different organs.

WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week: 3-4	**MATTER AND MATERIALS** **TOPIC: SOLUBILITY OF SUBSTANCES** **LO 1 : AS 1, 2, & 3** **LO 2: AS 1, 2 and 3** **ACTIVITIES:** • Teacher explains the concepts solutes, solvent & solution. • Demonstrates solubility of different substances. • Teacher explains the factors affecting solubility. • Learners do practical activities to find out soluble substances and the rate of solubility. **Practical Investigation** • Each group of learners chooses a factor around solubility to investigate e.g. • Temperature of the water (hot, warm, room temperature & icy water. • Changing the size of sugar pieces (four lumps, one lump, one lump broken into small pieces, one lump broken into grains, and one lump ground into powder). • Stirring(try not to stir, slow stirring and fast stirring) 1. Learners plan their investigation. • What do you want to find out? • What you predict will happen? • What equipment will you need? • What will you change each time? • What will you keep the same?	Write notes on solutes, solvents and solutions. Recording of results and drawing of a bar graph.	Books Water Ice blocks Sugar Burner Beaker

	• What will you actually measure? 2. Each group keeps all other factors the same except one factor. For example if they are investigating stirring, they must use the same amount of water at the same temperature and same amount of sugar each time. 3. Learners record their results in the form of a bar graph.		
Week:5	**MATTER AND MATERIALS** **TOPIC: PROPERTIES OF MATERIALS** **LO 1 AS: 1, 2 and 3** **LO 2: AS 1,2 and 3** **LO 3:AS 1 and 2** **ACTIVITIES:** • Teacher uses different types of materials to explain properties of materials such as hardness, thermal and electrical conductivity and compressibility. • Learners compare the hardness of materials e.g. different types of metals. • Conducts simple tests on thermal and electrical conductivity of materials. • Learners compare compressibility of materials.	Classification of materials according to hardness, electrical conductivity and compressibility. Identify different types of materials - thermal and electrical conductivity of materials.	Sand Salt Sugar Water Books

WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week:6	**ENERGY AND CHANGE** **TOPIC: ENERGY TRANSFER** **(expansion, contraction, melting, evaporation, condensation and solidification)** **LO 1: AS 1, 2, & 3** **LO 2: AS 1, 2 & 3** **LO 3: AS 1** **ACTIVITIES:** • Recall of previous knowledge on melting, evaporation, condensation and solidification. • Explain energy transfer concept in relation to electricity. • Conduct simple experiments to observe heat transfers: (conduction-by heating a piece of metal, Convection- by heating water in a beaker with a grain of potassium permanganate and radiation-stand next to a stove etc.) • Compare heat conductivity of different substances by doing experiments. • Make a presentation task/debate on how to control / minimize energy loss.	**Translation Task:** Learners compare heat conductivity of different substances and plot a graph on their findings. Short test	Books Metal rods Candle wax Burner Matches Plastic spoons A bowl hot water Beaker Potassium permanganate

WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week:7-8	**PLANET EARTH AND BEYOND** **TOPIC: DIFFERENT TYPES OF ROCKS** **LO 1: AS 1, 2, & 3** **LO 2: AS 1, 2 & 3** • Teacher explains different types of rocks and their properties. • Learners collect variety of rocks and break them to observe what they look like along a freshly broken section.	**Assignment:** • Collect some rocks near your school or home. Try to break them up so that you can see what they look like inside, along a freshly broken section. • In your groups, give each sample of rock a number. Use masking tape to label each sample. • Write a description of each sample of rock. • Share your description with your group and talk about similarities and differences in what you have recorded.	Books Variety of Graphs Masking tape Koki pens
Week: 9-10	**TOPIC: ORIGIN AND HISTORY OF ROCKS** **LO 1: AS 1, 2, & 3** **LO 3: AS 2 & 3** • Teacher explains the origin of: - Igneous rock - Sedimentary rock - Metamorphic rock • Visit mountains and rivers to observe different types of rocks. • Classify the types of rocks they find in the designated areas.	**Research project:** • Collect some rocks and record observations about them. • Find out about how igneous, sedimentary, and atmospheric rocks are formed • Identify some features of the landscape that are made of these kinds of rock. • Link the information of these kinds of rock to some of their characteristics.	Variety of rocks Flip charts Graph papers

TERM:4 WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week: 1	**LIFE AND LIVING** **TOPIC: ANIMAL LIVING TOGETHER IN A VARIETY OF SOCIAL PATTERNS** **LO 1: AS 1, 2, & 3** **LO 2: AS 1, 2 & 3** • Teacher describes the different social patterns. E.g. (a)being solitary (b)pairing for life (c)living in packs (d) Prides, herds, troops, colony. • Learners examine social patterns of animals in a habitat. • Learners list as many animals as they can and try to group them according to their social pattern. • They look at animals which occur in a common social pattern and suggest the reason for that. • Teacher explains the functions of individuals within a social pattern.	Case study: do a case study on a bee colony. Learners draw and label pictures	Books Pictures

WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week: 2-3	**MATTER AND MATERIALS** **TOPIC:THE DENSITY OF SUBSTANCES-MASS, VOLUME AND UNITS OF MEASUREMENTS** **LO 1: AS 1, 2, & 3** **LO 2: AS 1, 2 & 3** **ACTIVITIES:** • Teacher explains the concept of density and its relation to mass and volume. • Teacher let learners observe the sinking and floating and relates it to density • Teacher explains the reason for sinking and floating. • **Calculation of density** • Teacher shows learners how to calculate density using the formula (density = mass/volume) • Learners measure mass of different items and calculate the density. • Measure the volume of liquids and calculate the density. • Learners compare the masses of equal volumes of different solids and record their findings. • Learners investigate the relation between the mass of a substance and its volume.	**Practical investigation: no 1** Learners measure mass and volume of different substances and put them in water and observe whether they sink or float. **Practical investigation : no 2** Learners conduct an experiment to compare the mass of equal volumes of different solids.	Books Solid substances Water Bowl Mass meter Ruler

WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week: 4-5	**ENERGY AND CHANGE** **TOPIC: SOUND – TRANSFER OF ENERGY BY VIBRATION** **LO1 : AS 1, 2, & 3** **LO 2: AS 1, 2 & 3** **ACTIVITIES:** • Learners recall information on energy transfers in other systems. • Teacher explains the concept of transfer of energy in sound. • Learners predict energy transfers that take place in different systems and investigate energy changes taking place within a system and its surroundings. • Compare transfer of sound through different mediums.	**Investigation:** • Learners conduct an investigation to determine how energy is transferred through different mediums such as solid, liquid and water.	Metal rods Metal spoons Tuning fork Water Speaker

WEEKS	TEACHING AND LEARNING ACTIVITIES	ASSESSMENT	RESOURCES
Week: 6-7	**PLANET EARTH AND BEYOND** **Topic: Water resources, catchment areas, care and management of catchment areas.** **LO 3: AS 1, 2 & 3** **Activities:** • Make a list of various sources of water in your area • Visit a nearby dam and make an audit on the quality of water, the pollutants in that area, the activities that are taking place in that are • Talk to municipality/water authority about care and maintenance of catchments areas • Inform community about the need to have clean environment	Research Project: Questionnaire Assignment	Books Newspapers Internet TV
Week: 8-9	**Topic: Factors affecting the quality of water and catchment areas** **LO 1: AS 1, 2, & 3** **Activities:** • Learners visit nearby water resources to observe possible factors that affect the quality of water. • Learners observe record and present their findings on those factors. • Teacher assist the learners in identifying the causes of those factors	Investigation Assignment Presentation	Books Newspapers Internet TV

Lesson Plan Exemplar

<table>
<tr><td colspan="3">Grade :6 Natural Science Date:
Duration: 6 Hours</td></tr>
<tr><td colspan="3">Integration :
Languages
Learning Outcome5: Thinking and Reasoning
Technology
Learning Outcome 1:Technological processes and skills</td></tr>
<tr><td colspan="3">Strand/Theme: LIFE AND LIVING</td></tr>
<tr><td colspan="3">Core knowledge and content: Energy transfer and systems</td></tr>
<tr><td colspan="3">Focus: Animal behaviour: Obtaining food</td></tr>
<tr><td>LOs & Ass</td><td>Learning & Teaching Activities</td><td>Assessment</td></tr>
<tr><td>LO 1: Scientific Investigation
AS: Plan investigation
AS: conduct investigation and collect data
AS: Evaluate data and communicate findings
LO2 :Scientific knowledge
AS: Recalls meaningful information when needed:</td><td>Activity: 1
Teacher asks questions like: Is electricity like food for TV sets and lights and stove? What do you think? What does a radio do for us?
Where does the radio get its energy to work?
1. Stating what do they see happening?
2. If they cannot see anything happening then they feel the steel – wool.
3. What happens when you touch only one wire on the steel – wool?
4. What gives the energy to the steel – wool?
5. Does the steel – wool burn or not why?
Activity:2
Learners do simple experiments using batteries, wires, steel wool etc.</td><td>Question and answer</td></tr>
</table>

<table>
<tr>
<td>AS: Categorizes information.
AS: Interprets information</td>
<td>Teacher raises guiding questions about the experiments and guide them where necessary
Asking learners to say what they know about the flowing of electrical current i.e. conductors and insulators.
Learners discuss their observations and communicate findings in different groups.
Activity: 3
An experiment about conductors and insulators.
Different objects will be tested to prove if an object is an insulator or conductor.
They will bring 2x1,5v cells, 2 connecting wires, a piece of plank(size of match box) 2 drawing pins, a socket, 2,5 v bulb.
Give learners an activity whereby they will find out which substances are conductors and which one are insulators.
They will record their finding in the table given to them viz:
<table>
<tr><th>Material</th><th>Conductor</th><th>Insulator</th></tr>
<tr><td>1. Wood
2. Nail
3. Glass
4. Copper
5. Cardboard
6. Rubber
7. Plastic</td><td></td><td></td></tr>
</table>
Activity: 4
They will get a project whereby they will be making an electric circuit</td>
<td>Practical activity to find conductors and insulators.</td>
</tr>
</table>

	individually. Each learner will explain how she/he made her/his electric circuit by following the instructions from the worksheet given to them with a rubric. For those who are grasping fast they will be making a series circuit (where you connect the bulbs in a kind of a chain – one after each other) following instructions from the worksheet given to them. **<u>Investigating safety rules for electricity</u>** Learners in different groups will choose six rules from the list given and state which are most important for working with electricity. They must be able to explain why? So out of these rules they will make a drawing or diagram so that someone who cannot read can understand that rule. They will colour their drawing then they will create posters about electricity and safety. Corrections will be done for projects.	Classifying conductors and insulators. Making an electric circuit individually. Investigation on safety rules
Resources	Textbooks, Internet, Newspapers, Magazines, Charts, Pictures, Worksheet , Human resource, Electric cells or batteries, Bulb wires, Bulb holders, Switches, Masking tapes, Copper wires, Bulbs.	
Expanded Opportunity	Research on other energy transfer systems	
Reflections	Teacher will reflect on: - How the lesson would have been presented differently Concepts that have not been dealt with effectively	