NEW AGE SCIENCE

FOR BASIC SCHOOLS

TEACHER'S GUIDE BOOK

3

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Preface

The teacher's guide has been written to assist the teacher to help learners to acquire the required skills and attitudes and also to help them understand the concepts as explained in the textbooks and workbooks.

The Teacher's Guides have been written to deliver the new curriculum for Basic Schools produced by the Ministry of Education for the National Council for Curriculum and Assessment (NaCCA). It has been developed by an expert team of Ghanaian teachers and educators and its aim is to achieve the content standards and indicators and exemplars of the curriculum and to support the teachers as they work with the learners throughout the six years.

The curriculum uses a learner-centered approach and works to develop the skills that the learner should acquire. The curriculum is designed to help learners acquire both scientific attitudes and process skills and cognitive ability and be able to apply them. The course is activity-based and proceeds on the knowledge that learners learn best when they are actively doing science and not just listening or reading about it.

The Teacher's Guide is designed to support teachers as they create the facilitating and learning opportunities and activities through which the learners will develop their science skills, their attitudes and cognitive abilities.

For each indicator in the learner's book the guide provide a list of key words introduced in the indicator, advice on lesson planning, materials and resources required for the indicator to enable the facilitator achieve his or her aim. Local materials of low or no cost are suggested.

The teachers are also provided with different kinds of assessments to enable them find out what the learners know already (diagnostic) and whether they are following the steps as the lesson progresses (progressive)

The answers to these assessment questions and those of study questions in the learners textbook as well as those in the workbook have all been provided in the teacher guide. These will help the facilitator to do his or her work effectively.

School-based Assessment (SBA) is an important feature of the new curriculum. The study questions at the end of each indicator in the learners book are written in the same line as the SBA. We hope that this will assist the facilitator in their assessment. We hope that you will enjoy using the guide and it will help in your work as a facilitator to help the learners develop their scientific abilities.

General Introduction
Science and Technology is the backbone of social, economic, political and physical development of a country. It is because of this realization that the Ministry of Education through the Ghana Education Service and the National Council for Curriculum and Assessment (NaCCA) has developed the curriculum for basic schools.

Aims and Objectives of Teaching Basic Science in the Primary School.

The curriculum is aimed at shaping individuals to become scientifically literate, good problem solvers, have the ability to think creatively and develop both the confidence and competences to participate fully in Ghanaian society as responsible local and global citizens. The Science curriculum is designed to help learners to;

- Develop the spirit of curiosity, innovation and critical thinking for investigating and understanding their environment;
- Develop skills, habits of mind and altitudes necessary for scientific inquiry;
- Communicate scientific ideas effectively;
- Use scientific concepts to explain their own lives and the world around them;
- Live a healthy and quality life;
- Develop humane and responsible altitude towards the use of all resources of Ghana and elsewhere
- Show concern and understanding of the interdependence of all living things and the environment in which they live;
- Design activities for exploring and applying scientific ideas and concepts
- Develop skills for using technology to enhance learning;
- Use materials in their environment in a sustainable manner.

Rationale for teaching Basic School Science.
Science forms an integral part of our everyday life, and it is a universal truth that development is hinged in science. Science consists of a body of knowledge which attempts to explain and interpret phenomena and experiences in rational terms. Science has changed our lives and it is vital to Ghana's future development.

To provide quality science education, teachers must facilitate learning in the science classroom. This will provide the foundation for discovering and understanding the world around us and lay the basis for science and science-related courses of study at higher levels of education. Learners should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave and analyse the origins, causes and effect of things in our environment.

Science is also concerned with the development of attitudes, and therefore, it is important for all citizens to be scientifically and technologically literate for sustainable development. Science has to be taught using hands-on and minds-on approaches, which learners will find as fun and adopt as a culture.

Philosophy

i. Teaching

Ghana believes that an effective science education needed for sustainable development should be inquiry-based. Thus science education must provide learners with opportunities to expand, change, enhance and modify the ways in which they view the world. It should be pivoted on learner-centred methodology and learning approaches that engage learners physically and cognitively in the knowledge-acquiring process in a niche and vigorous inquiry-driven environment.

ii. Learning

Science Learning is an active contextualized process of constructing knowledge based on learner's experiences rather than acquiring it. Learners are information constitutors who operate as researchers. Teachers serve as facilitators by providing the enabling environment that promote the continuation of learners own knowledge based on their previous experiences. This makes learning more relevant to the learner and leads to the development of critical thinkers and problem solvers.

Instructional Expectation(Role of the Facilitator)

1. Guide and facilitate learning by generating discourse among learners and challenging them to accept and share responsibility for their own learning based on their unique individual differences.
2. Select science content, adapt and plan lessons to meet the interests, knowledge, understanding abilities and experiences of learners.
3. Work together as colleagues within and across disciplines and grade levels to develop communities of science learners who exhibit the skills of scientific inquiry and the attitudes and social values conducive to science learning.
4. Use multiple methods and systematically gather data about learners' understanding and ability, to guide science teaching and learning with an arrangement to provide feedback to both learners and parents.
5. Design and manage learning environments that provide learners with time, space and resources needed for learning science.

Core Competencies

These describe a body of skills that learners at all levels should seek to develop in the learners. There are ways in which teachers and learners engage with the subject matter as they learn the subject. The competencies presented here describe a connected body of core skills that are acquired throughout the process of teaching and learning.

Critical Thinking

This skill helps to develop learners' cognitive and reasoning abilities to enable them analyse and solve problems. This skill enables learners to draw their own experiences to analyse situations and choose the most appropriate out of possible solutions. It requires the learners embrace the problem at hand and persevere and take responsibility for their own learning.

Creativity and Innovation
This skill promotes the development of entrepreneur skills in learners, through their ability to think of new ways of solving problems and developing technologies for addressing the problem at hand. It requires ingenuity of ideas, arts, technology and enterprise. Learners having this skills are also able to think independently and creatively.

Communication and Collaboration.
The competence promotes in learners the skills to make use of language, symbols and texts to exchange information about themselves and their life experiences. Learners actively participate in sharing their ideas. They engage in dialogue with others by listening to and learning from them. They also respect and value the views of others.

Cultural Identity and Global Citizenship
This competence involves developing learners to put country and service foremost through an understanding of what it means to be active citizens. This is done by inculcating in learners a strong sense of social and economic awareness. Learners make use of the knowledge, skills competencies and attitudes acquired to contribute effectively towards the socio economic development of the country and in the global stage. Learners build skills to critically identify and analyse cultural and global trends that enable them to contribute to the global community.

Personal Development and Leadership
This competence involves improving self-awareness and building self-esteem. It also entails identifying and developing talents, fulfilling dreams and aspirations. Learners are able to learn from mistakes and failures of the past. They acquire skills to develop other people to meet their needs. It involves recognising the importance of values such as honesty and empathy and seeking the well-being of others. Personal development and leadership enables learners to distinguish between right and wrong. The skill helps them to foster perseverance, resilience and self-confidence. This skill (PL) helps learners to acquire the skill of leadership, Self-regulation and responsibility necessary for lifelong learning.

Digital Literacy(DL)
The skill develops learners to discover, acquire knowledge and communicate through ICT to support their learning. It also makes them use digital media responsibly.

Scope of Content
The content standards in the curriculum have been carefully selected to introduce learners to the inquiry process of science as well as the basic ideas in science.

The Teacher's Guide are series of books written in a simple easy to read and understand language. Almost every scientific term used is simplified as much as possible. There are simple illustrations, examples, hands-on minds and eyes-on activities which are very necessary in teaching science.

Organisation of the Teacher's Guide

The Teacher's Guide has been organised to confirm with the Learners Text Book. It is made of strands, sub-strands, content standards, Indicators and examples. A unique annotation is used for numbering the learning indicators in the curriculum for the purpose of referencing. An example is shown in the table below.

Annotation	Meaning/Representation
B3	Year or class
2	Strand Number
4	Sub-Strand Number
1	Content Standard Number
2	Indicator Number

Strands – the broad areas/sections of the science content to be studied.

Sub-strand – the topics within each strand under which the content is organised.

Content Standard – the predetermined level of knowledge, skill and attitude that a learner attains by a set stage of education.

Indicator – a clear outcome or milestone that learners have to exhibit in each year to meet the content standard expectation. The indicators represent the minimum expected standard in a year.

Exemplar - support and guidance which clearly explains the expected outcomes of an indicator and suggests what teaching and learning activities could take to support the facilitators/teachers in the delivery of the curriculum.

The Teacher's Guide has also been organized along the same line. In addition it has an introduction , key words, materials and resources, additional information, diagnostic and progressive assessment and their answers as well as answers to text book study questions.

Role of the Facilitator (Before A Lesson)

- Collect materials around the school environment with the help of learners
- Plan the best way to teach the lesson.
- With the help of indicators and exemplars select and plan activities for the learners.
- Try out the activity to find out its suitability to the achievement of the indicators.

The Role of the Facilitator/Teacher (during the lesson)

- Introduce the lesson and give out the materials
- Supervise and guide learners as they perform the activity
- Move round and ask questions or provide clues at times
- Evaluate learners work
- Act as a co-learner
- Encourage learners when the need arises.

The Role of the Facilitator/Teacher (After the lesson)

- Organize a general class discussion with learners to concretize concepts, skills, altitudes and correct misconception.
- Assess learners by giving them assignment, exercises and quizzes.
- Work assignment, quizzes and exercises

The Role of the Learners.

1. Before the lesson.
    - They may be involved in the collection and gathering of materials necessary for the lesson.
    - They may be involved in the planning of the activities.

2. During the Lesson
    - Learners interact with the materials as they try to find out answers to their own question and that of the facilitator through the use of the materials.

Special Attention Learners

A class may consist of learners of different physical problems and mental abilities. Some of the learners may have high abilities whiles others may be slow learners, some may be dyslexic and not able to read or spell well as the others in the class. All these are special needs – learners and need special attention.

Ensure that you give equal attention to all leaners in the class to provide each of the equal opportunities for learning. Learners with disabilities may be hidden talents that can only come to light if you provide them with the necessary encouragement and support in class.

In the classroom, learners should

- Communicate among their group members and with the facilitator.
- Record their findings and observation by making models, sketches and drawings and writing.

After the lesson

- Learners participate in general class discussion with the facilitator
- Cause not their assignments
- Tidy up the classroom

Assessment

The facilitator must continuously assess himself or herself as well as the learners. This is a process of collecting and evaluating information about learners and using the information to improve their learning.

In this curriculum, it is suggested that the facilitator uses assessment to promote learning and so identifies the strengths and weaknesses of learners to enable him or her ascertain the learners response to instructions.

Assessment is both formative and summative. Formative assessment is viewed in terms of assessment as learning and Assessment for learning.

Assessment as Learning:
It relates to engaging learners to reflect on the expectations of their learning. Information that learners provide the facilitators form the basis for refining teaching-learning strategies.

Learners are assisted to play their roles and to take responsibility of their own learning to improve performance. Learners are assisted to set their own goals and monitor their progress.

Assessment For Learning
This is an approach used to monitor learners progress and achievement. This occurs throughout the learning process. The facilitator employs assessment for learning to seek and interpret evidence which serves as timely feedback to refine their teaching strategies and improve learners' performance. Learners become actively involved in the learning process and gain confidence in what they are expected to learn.

Assessment of Learning
This is summative assessment. It describes the level learners have attained in the learning, what they know and can do over a period of time. The emphasis is to evaluate the learners cumulative progress and achievement.

Which assessment the facilitator uses depends on its purpose. Try to select indicators in such a way that you will be able to assess a representative sample from a given strand. Each indicator in the curriculum is considered a criterion to be achieved by the learner. When you develop assessment items based on a representative sample of the indicator taught the assessment is referred to as a 'Criterion-Referenced Assessment'. A facilitator cannot assess all indicators taught in a term. The assessment procedure you use i.e. class assessment, homework, projects etc. must be developed in such a way that the various procedures complement one another to provide a representative sample of indicators taught over a period.

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STRAND 1: DIVERSITY OF MATTER

SUB-STRAND 1: LIVING AND NON-LIVING THINGS

LESSON 1: CLASSIFY LIVING THINGS BASED ON THEIR LIFE PROCESSES

We are surrounded by many materials. Some of the materials are living things and others are non-living things. The living things can also be classified further into certain groups. We can use the knowledge of the physical features and life processes of these living things to classify them.

Content Standard: B3.1.1.1 Show understanding of the physical features and life processes of living things and use this understanding to classify them

Core Competencies: Critical thinking and Problem Solving, Digital Literacy, Collaboration and Communication, Personal Development and Leadership, Creativity and Innovation

Expectations: At the end of this lesson you will be able to:

- Identify life processes of plants and animals
- sort and group living things into plants and animals

Subject Specific Practices: Observing, Classifying, Predicting, Analysing, Evaluating

Resources: Any young plant uprooted, any animal(e.g insect), cut-out pictures or flash cards of plants and animals such as mosquito, shea butter tree, termite, parrot, monkey, cocoyam, water melon, okro, tomato, pepper, scorpion and snake .

Reference: Learners Book 3 page 2 -7

Introduction

We are surrounded by many materials. Some of the materials are living things and others are non-living things. The living things can also be classified further into certain groups. We can use the knowledge of the physical features and life processes of these living things to classify them.

Indicators and exemplars: B3.1.1.1.1 Classify living things into plants and animals by their life processes

Key words: classify, plants, animals, life processes

Additional Information

There are many things in homes, schools and communities. These things are in two groups. These groups are living and non-living things. Life processes are used to determine whether something could be classified as living thing or non-living thing. A mouse and a stone are found

in communities. A mouse can manifest certain processes which show that it is a living thing. A stone cannot show those processes because it is not a living thing.
Living things: grow, move, breathe air, reproduce and feel
Non-living things do not grow, move, breathes air, reproduce and feel.

Starting the lesson
Start this lesson by drawing attention of learners to yourself and the chair or table he or she sits on. Ask learners to mention the things that he or she can do which the table or chair cannot do.

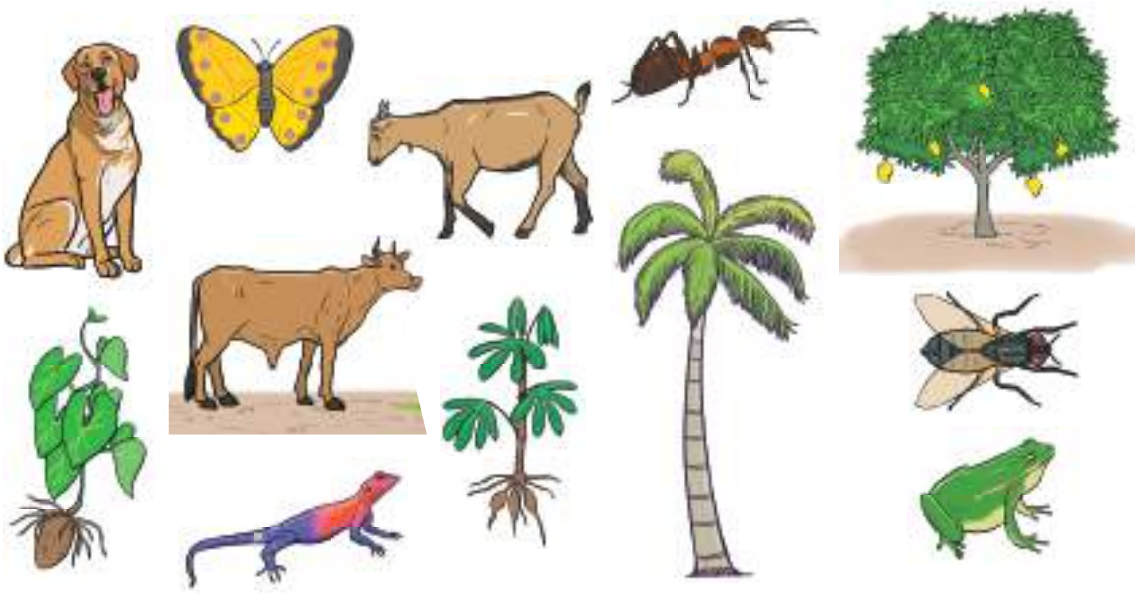
Activity: 1.1.1.1a: Sorting out living things into plants and animals

Materials/Resources (Low or no cost): Cut-out pictures or flash cards of plants and animals such as mosquito, shea butter tree, termite, parrot, monkey, cocoyam, water melon, okro, tomato, pepper, scorpion and snake .

Procedure
- Show to learners, pictures or videos on living things.
- Show and gives to learners cut-out pictures or flash cards of plants and animals.
- Tell learners to sort out the cut-out pictures or flash cards into plants and animals.
- Draw two large circles on your.
- Tell learners to look at the two large circles you have drawn on your table.
- Ask learners which circle has plants written in it.
- Again ask learners which circle has animals written in it.
- Tell learners to put the plants into the circle of plants and animals into the second circle of animals based on life processes.
- Produce more materials for different activities.

Plants and animals
Explain to learners based on the activity they have been engaged in that living things can be put into two general groups as plant and animals.

Explain to learners that animals move from place to place by themselves but plants do not move from place to place by themselves. Plants make their own food but animals do not make their own food but feed on plants.



Show pictures of living things on page 4 and 5 of pupils' textbook to learners and hence asks them, in groups of four or five, to discuss the things in the pictures .

Summary

- Living things: grow, move, breathe air, reproduce and die.
- Non-living things do not – grow, move, breather air, reproduce and die.

Diagnostic assessment

1. Animals and plants are all living things. Write one thing which animals do but plants cannot do.
2. Plants have roots but animal do not have.
   True or False

Progressive assessment

1. Why do animals move from place but animals do not.
2. Select living things from the following list: teddy bear, mouse, aeroplane, fish, kite, teddy bear, stone, goat, chicken

Answers to diagnostic assessment

1. Animals can move from place to place plants cannot
2. True

Answers to Progressive Assessment

1. Animals have legs to walk which make them move from place to place but plants have root fixed in the soil and cannot move.
2. mouse, fish, chicken

Answers to Study Questions

1. Monkey = animal, Mango tree= plant
2. Animals = termite, parrot, monkey, mosquito, scorpion and snake
   Plants = cocoyam, water melon, okro, tomato and pepper
3. They can feed, reproduce, respire feel and excrete (Any 3)
4. Termite, parrot, monkey, mosquito (Any 3)
5. Mango tree (Any correct name of plant)
6.

 Plant	 Animal	 Plant
 Plant	 Animal	 Animal

 Animal	 Plant	 Animal	 Plant

b) move
feed
excrete

STRAND 1: DIVERSITY OF MATTER

SUB-STRAND 2: MATERIALS

LESSON 1:`EVERYDAY MATERIALS, THEIR USES AND PROPERTIES

Content Standard: B3.1.2.1 Recognise materials as important resources for providing human needs

Core Competencies: Critical thinking and Problem Solving, Digital Literacy, Collaboration and communication, Personal Development and Leadership

Expectations: At the end of this lesson you will be able to:

- discuss the uses of materials using think-pair-share.
- identify uses of materials in relation to their properties, e.g. metals are used for making car bodies because they are hard, plastics are used for making bottles, buckets, bowls because they can be moulded into different shapes
- match some products such as buckets, cups, books, tables with their material sources such as metals, clay, glass, wood, plastics.

Subject Specific Practices: Observing, Classifying, Predicting, Analysing, Evaluating

Resources: Cotton wool, clay, pieces of paper, glass, wood, plastics, metal and leather.

Reference: Learners Book 3 page 8 -17

Introduction

The things we see around us are either living things or non-living things. In the previous lesson, learners were able to classify living things into plants and animals. Having been able to do this, they need to progress to identify materials in their environment which are used in their everyday life. Some of these materials derive their source from living things or non-living things. They have unique properties. They are used to make certain objects we use every day.

Indicators and exemplars: B3.1.2.1.1 Identify the uses of everyday materials and link the uses to their properties

Key words: properties, soft, hard, raffia, transparent, basketry, wood, plastics, paper, metals, leather, cotton, terrazzo

Additional Information

There are different materials around us. These materials have certain properties. These properties enable them to be used the way they are used to satisfy human needs. They are

therefore very important resources which human beings use to satisfy their needs. Some of these materials are either metals or non-metals. No two individual materials can have the same properties, though they may seem to have similar properties. A stone is hard. A metal is also hard but they cannot be used for the same purpose. A foam is soft and clay is also soft but they are used for different purposes. In considering the properties of materials, the purpose for which human beings want to use them is also taken into consideration. A metal is used to make aeroplanes but it is not every metal that can be used.

Properties of materials enable them to be used in making certain products. Some of them are:

- clay is used for making pots because it is soft and can be moulded without breaking.
- cotton wool is used to make pampers because it is soft and can soak water.
- leather is used to make shoes because it is soft, light, strong, it can be cut easily, and can be shaped into different shapes and forms
- raffia palm is used for making basket because it can bend easily.
- plastics are used to make bowls, buckets and bottles because they can be moulded into different shapes
- glass is used to make windscreen of cars because it is transparent (you can see through it).
- transparent plastics are used to make ballot boxes because you can see through them.
- wood is used to make furniture because it is hard.
- metals are for car bodies because they are hard.
- marbles are used to make terrazzo floors, tiles in some houses and also countertops in some stores because they are hard, smooth or rough.

Starting the lesson

You can capture the attention of learners to this lesson by asking them to stand up and sit down again. Teacher asks learners what they are sitting on. Proceed to ask learners the materials used to make what they are sitting on.

Having captured the attention of the learners, start the lesson by showing to them, video or the picture of common materials in the environment which include wood, plastics, paper, metals, leather and cotton. Teacher refers to page 9 of pupils' text book 3

Activity: 1.2.1.1a Collecting a variety of everyday materials from your environment (home, school and community)

Materials/Resources (Low or no cost): Cotton wool, pieces of paper, wood, plastics, metal and leather.

Procedure

- Tell learners to collect a variety of everyday materials from their home, school and community to the classroom. Give this instruction the day before this lesson.
- Tell learners to let the materials they collect include the following: Cotton wool, pieces of paper, wood, plastics, metal and leather.
- Tell learners to think critically about the materials they collected about their uses.
- Tell learners to pick a friend and tells him or her about the uses of the materials he or she collected.
- Tell learners to let their friends also tell them about the uses of the materials (Think-pair-share).
- Ask learners whether they all agree on the same uses of the material.
- Tell learners to think critically about the properties of the material they collected that make them to be used the way they are used (Brainstorming).
- Tell learners to discuss what they think with their friends. Use examples such as: metals are used for making car bodies because they are hard, plastics are used for making bottles, buckets, bowls because they can be moulded into different shapes to guide learners.
- Refer learners to page 10 - 13 of pupils textbook 3.

Activity: 1.2.1.1b Matching products and materials used to make them

Materials/Resources (Low or no cost): pencil, bucket, cups, books and tables

Procedure

- Give to learners the following product that are used in everyday life: pencil, bucket, cups, books and tables
- Give to learners the following materials: metal, clay, glass, wood, plastics
- Tell learners to write down the products in their exercise book
- Tell learners to write down the material used to make products on the right side of the products
- Tell learners to use arrows to match the products against the correct materials from which they are made.

An example is done for you in figure 1.2.1.1.1

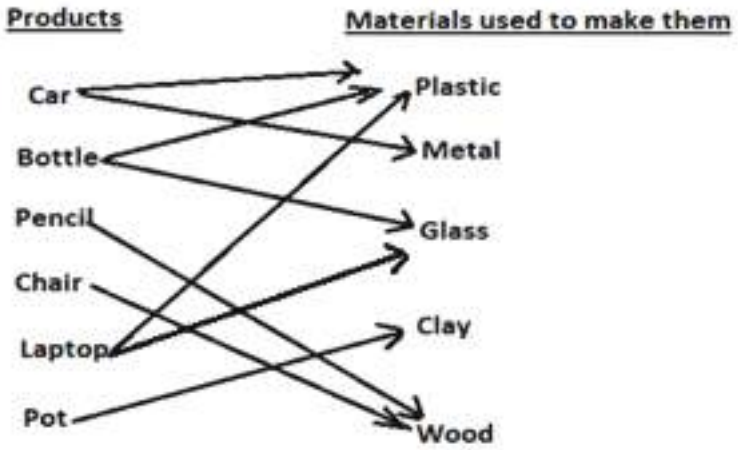


Figure: 1.2.1.1.1 Matching products and materials used to make them

Summary

- There are different materials around us which have certain properties.
- The properties of materials enable them to be used the way they are used to satisfy human needs.
- Glass, for example is used to make windscreen of cars because it is transparent (you can see through it).

Diagnostic assessment

1. Write down two materials
   i. in your home
   ii. in your school

2. Write down the materials used to make the following items and why those materials are used
   i. flower pot
   ii. bread knife

Answers to Progressive assessment

1. (a) A and B are ballot boxes
   (b) Plastic because they are hard and do not break easily
   (c) A
   (d) Plastic
   (e) (i) A= hard and transparent (ii) B= Hard and opaque

A

B

2. (i) It must have padlock and key so that it can be safe. Nobody should be able to see inside except the one who put the exam papers inside it
   (ii) Metal
   (iii) It is hard and nobody can break it. It is opaque and nobody can see inside

Answers to Study Questions

1. Fill in the blank spaces of the following with the correct words: Properties of materials enable them to be used in making certain products. Clay is used for making pots because it is soft and can be moulded without breaking. Metals are used for making car bodies because they are hard. Plastics are used to make bowls, buckets and bottles because they can be moulded into different shapes.
2. Your belt is made from leather because it can stretch.
3. Balloon is made from rubber because it can stretch
4. For each product in the pictures below, identify the material used to make it and write it under it

			
clay	metal	plastic	glass
			
Wood	metal	metal and rubber	

5. i) wood – hard
   ii) Plastic – moulded
   iii) Metal – hard
   iv) Fabric – soft
   v) Glass – transperant

STRAND 1: DIVERSITY OF MATTER
SUB-STRAND 2: MATERIALS

LESSON 2: MATERIALS USED FOR MAKING COMMON OBJECTS

Content Standard: B3.1.2.1 Recognise materials as important resources for providing human needs CONT'D

Core Competencies: Critical Thinking and Problem Solving, Collaboration and communication, Personal Development and Leadership

Subject Specific Practices: Observing, Analysing, Evaluating

Resources: computer, football, tennis ball, clothes, mobile phone, pencils, glass, plastics, wood, metals, clay, leather or pictures where a particular material or object is not available

Reference: Learners Book 3 page 18 -23

Introduction
Having been able to identify the uses of every day materials based on their unique properties learners need to understand that the objects that we use every day are not only made of one type of materials but more than one.

Indicators and exemplars: B3. 1.2.1.2 Demonstrate understanding that an object is made of one or more materials.

Key words: computer, football, clothes, mobile phone, pencils, glass, plastics, wood, metals

Additional Information
We are surrounded by many materials. Some of the materials are made of only one kind. There are others that are made of more than one kind of materials. For example laptop is of plastic, glass and metal. A car is made of metal, plastic, rubber, glass, fibre, foam. Every material has certain unique properties. These properties enable them to be chosen to make certain things. Two or more materials with their individual unique properties are combined to make a particular object.

Starting the lesson

You can capture the mind of learners to this lesson by telling them to bring out their exercise books and examine them to see what they are made of. Teacher guides learner to look at even the metal used to clip the individual sheets of paper together.

Proceed at this point to tell learners to look at the materials in the picture on page 17 of pupils textbook 3.

Shows to learners, materials displayed on his or her table.

Ask learners which of the materials in the picture they can identify from those that he or she has shown them.

Provide learners with glass, plastics, wood, metals, clay and any other relevant material.

Tell learners that these materials are used to make certain product as they have seen in the previous lesson.

Give learners an example a product and the materials used to make it.

Show to learners some products or pictures of products and tells them to identify materials used to make them as follows: Computer, Car, Mobile phone, Umbrella, Key, Pencil, Car battery.

Use the following as checklist to verify the responses of learners:
Computer: glass, plastic, metal
Car: metal, glass, plastic
Mobile phone: class, plastic, metal
Umbrella: plastic, metal, wood (not all of them)
Key: metal

Pencil: wood, graphite
Car battery: plastic, metal, water, acid

Affirm to learners what they have seen for themselves that most objects around them are made of one or more materials.

Engage learners in more activities to build the concepts of objects and materials

Summary

- Objects around us are made of more than one kind of materials.
- Every material has certain special properties that other materials do not have.
- To make some objects, you have to combine two or more materials before you can make them.

Diagnostic assessment

1. Write down two materials used to make
   i. bicycle
   ii. a table in your classroom
2. Write down the materials used to make the following items and why those materials are used
   i. Fanta bottle
   ii. pressing iron

Progressive assessment

1. Look at the picture below

   (a)Identify what is in the picture
   (b) What materials are used to make what is in the picture?
2. There is no running water in your school. You were asked to design a container to serve that purpose for your class

i. what will you think of in designing the container?
ii. what materials will you use to achieve your aim?
iii. what will you use each material for?

Answers to Diagnostic assessment

1. (i) metal and rubber
   (ii) wood and metal(for nail)
2. (i) Glass because it is hard and transparent. Metal (for the stopper) because it is hard
   (ii) metal because it is hard and heat can pass through it. Plastic because heat and electric current cannot pass through it

Answers to Progressive assessment

1. (a) bicycle
   (b) metal, rubber, plastic
2. (i) the container with a lid. A tap at the bottom of the container
   (ii) Plastic, metal and glue
   (iii) Plastic to make the container and the lid. Metal to make the tap. Glue to fix the tap to the container

Answers to textbook questions

1. clay = soft, rubber= bendable, wood= hard
2.

Object	Materials used to make it	Property of material
	Rubber, metal	bendable, Hard
	Metal, glass, rubber	Hard, transparent, bendable
	Plastic, metal, glass	Hard, transparent

	Glass, plastic, metal	Hard
	Wood, graphite	Hard(wood), soft(graphite)
	Clay	Soft, can be moulded
	Metal	Hard, can be moulded
	Plastic, acid, metal	Hard

3. metal, glass, rubber
4. glass / windscreen
5. metal or iron

STRAND 1: DIVERSITY OF MATTER
SUB-STRAND 2: MATERIALS

LESSON 3: HOW TO FORM AND SEPARATE SOLIDS AND LIQUID MIXTURES

Content Standard: B3.1.2.2 Understand mixtures, types, formation, uses and ways of separating them into their components

Core Competencies: Critical thinking and Problem Solving, Collaboration and Communication, Personal Development and Leadership, Creativity and Innovation

Expectations: At the end of this lesson you will be able to:

- Prepare solid-liquid mixtures by adding sand to water or any solid to a liquid.
- observe and come out with findings on the components of the mixture.
- describe solid - liquid mixtures
- separate components of solid-liquid mixtures
- discuss the uses of solid-liquid mixtures in everyday life.
- Do a project to separate solid-liquid mixtures, e.g. gari and water, sand and water, salt solution.

Subject Specific Practices: Observing, Classifying, Predicting, Analysing, Evaluating

Resources: samples of tea, fanta, coca-cola, "hausa koko", "asana", "sobolo", "blukutu", "pito" , beakers, funnel, filter paper or calico, water and sand.

Reference: Learners Book 3 page 24 -33

Introduction
The learners after realising that the objects we use in every day life is made up of more than one material, they should know that the materials which are combined to make other materials are not only solids. There are some materials which are liquids. A solid and liquid can also be combined to form a mixture and can be separated.

Indicators and exemplars: B3. 1.2.2.1 Describe solid-liquid mixture and explain how to separate the components

Key words: combination, component, mixture, solid, liquid, substances, water, sand, iron filings, charcoal

Additional Information
There are different materials in the environment. These materials can be combined to form a single object. An example is a metal and wood are used to make a chair. This object cannot be described as a mixture. Other materials can be combined to form a mixture. A mixture

is a physical combination of two or more substances. There are different types of mixtures. These depend on the materials that are combined. This means that there are also other types of mixtures apart from solid-solid mixtures. We have solid-liquid mixture as another type of mixture which is the focus of this lesson. A solid-liquid mixture is a combination of a substance which is solid and another substance which is liquid. If you added sugar to water in a cup and you stir it, the sugar will dissolve in the water. Though the sugar has disappeared, it is still there in the water. The sugar and water form a solid-liquid mixture.

Uses of solid-liquid mixture in everyday life

You use solid-liquid mixtures in everyday life. The tea you drink contains sugar dissolved in water. There are other examples.

Sugar solution: The following substances contain sugar solution: tea, fanta, coca-cola, “hausa koko”, “asana”, “sobolo”, “blukutu”, “pito”

Salt solution: the following contain salt solution: soup,

Water and gari also forms solid-liquid mixture used by many people. Students in boarding houses and hostels use this often. Water is the liquid and gari is the solid

Water and tapioca is also a solid-liquid mixture.

Iced kenkey contains water and sugar or water and kenkey.

Liquid soap contains water and chemicals.

In groups of four or five discuss the uses of solid-liquid mixtures in everyday life apart from the examples given you already in the book.

powdered chacoal

water

salt

sand

iron filings

It is possible to separate a mixture into its components. This depends on the components that are combined to form the solid-liquid mixture.

Starting the lesson

Capture the attention of learner for this lesson by asking them about the food they ate during breakfast. If some of the mention teacher, teacher asks learners what theyuse to prepare the teacher. Some learners will mention water, sugar, milo, tea leaf and milk. Teacher proceeds to select water (liquid) and sugar(solid) to start the lesson on solid-liquid mixture.

Activity 1.2.2.1a: Separating components of a mixture

Materials/Resources (Low or no cost): two beakers, funnel, filter paper, water and sand.

Procedure

- Tell learners to organise themselves into groups of four or five
- Give the following materials to each group: two beakers, funnel, filter paper, water and sand.
- Ask learners what the state of the water is
- Ask learners What is the state of the sand is
- Tell learners to pour the water into the beaker.
- Tell learners to add the sand to the water in the beaker.
- Tell learners to stir the water and the sand with a stick vigorously and allow it to stand.

Ask learners:

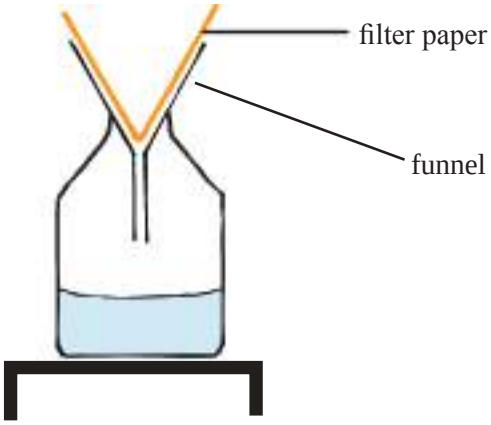
- what they have formed
- whether what they have formed is it a solid-liquid mixture and why
- whether they can they can separate the sand from the water

Tell learners to:

- fix the funnel in the second beaker as shown in the picture
- fold the filter paper and place it in the funnel
- pour what they mixed in the beaker into the funnel, a little at a time till they finish pouring all.

Ask learners:

- what substance is left on the filter paper
- what substance is collected in the beaker
- whether the water is separated from the sand
- to identify the method by which the water is separated from the sand



Give learners the following explanation: You are able to separate the water from the sand by filtration method because the water can pass through the filter paper but the sand cannot pass through it. You can also use calico instead of the filter paper.

Project: Describe how you will separate the following mixtures:

i. water and gari
ii. water and sand
iii. salt solution
iv. iron filling, sand and water

Summary

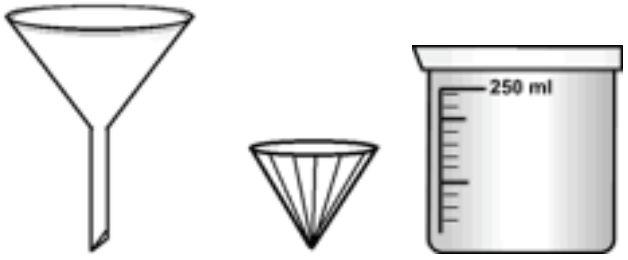
- solid-liquid mixture as another type of mixture.
- a solid-liquid mixture is a combination of a substance which is solid and another substance which is liquid.
- if you added sugar to water in a cup and you stir it, the sugar will dissolve in the water to form solid-liquid mixture

Diagnostic assessment

1. How will you separate a mixture of rice and water?
2. 2. State what makes the following solid–liquid mixtures:
   i. pito
   ii. sobolo
   iii. cocoa drink

Progressive assessment

1. Examine the picture below



A B C

   i. Identify the equipment in the picture
   ii. Write down two examples of mixtures that can be separated by using A, B and C
   iii. Name the method used in the above separation

2. Look also at the object in the picture below

Name one solid-liquid mixture that can be separated by the equipment in the picture

Answers to Diagnostic assessment

1. Fold filter paper. Place filter paper in funnel. Place beaker under the funnel. Pour mixture of rice and water into the funnel, a little at a time. Water passes through the filter paper in the funnel and collects in the beaker. The rice remains on top of the filter paper in the funnel.
2. (i) pito= It contains water which is liquid and sugar which is solid
   (ii) sobolo= It contains water which is liquid, sugar which is solid and some red substance which is also solid
   (iii) cocoa drink = It contains water which is liquid, sugar and cocoa powder which are solids

Answers to Progressive assessment

1. (i) A= funnel, B= filter paper, C= Beaker
   (ii) sand and water, saw dust and water
   (iii) Filtration
2. Iron filings sugar and water

Answers to Study Questions

1. A solid-liquid mixture is a combination of a substance which is solid and another substance which is liquid
2.
   i. salt solution

ii. sugar solution is used to soak gari, salt solution is used to make soup

3. It is a combination of salt and water
4. Yes. This is because it contains water and salts
5. i) Muddy water, chalk powder + water
   ii) Salt + water
   sugar + water
   iii) Gari and water
   rice grains in water.

STRAND 1: DIVERSITY OF MATTER
SUB-STRAND 2: MATERIALS

LESSON 4: HOW SUBSTANCES CHANGE STATE BETWEEN SOLID, LIQUID AND GAS

Content Standard: B3.1.2.3 Know that substances can exist in different physical state (solid, liquid, Gas). Many substances can be changed from one state to another by heating or cooling

Core Competencies: Critical thinking and Problem Solving, Digital Literacy, Personal Development and Leadership

Expectations: At the end of this lesson you will be able to:

- identify the physical states of the materials provided.
- observe how heated water changes to gas and cools down from gas to water (from liquid to gas and back to liquid).
- melt Shea butter and candle wax and let them observe how they change from solid to liquid and liquid to solid.
- explain how substances change state.

Subject Specific Practices: Observing, Manipulating, Analysing, Evaluating

Resources: candle wax or shea butter, beaker, water, beaker and a source of heat

Reference: Learners Book 3 page 34 - 40

Introduction
The substances (materials) which are combined to form mixtures are not found always in the same state. The physical state of any material can change. Learners therefore need explanation about how the physical state of these substances can change from one particular state to the other. Application of heat or cooling plays a vital role in the change in the physical state of substances.

Indicators and exemplars:B3. 1.2.3.1 Explain how substances change state between solid, liquid and gas

Key words: states, solid, liquid, gas, heat, temperature, evaporation, freezing, melting

Additional Information
Substances exist in three main states. These states are solid, liquid and gas. All substances can be made to change from one particular state to another state. At room temperature all substances are found to exist in a particular state and will continue to be in that state until there is a change

in temperature. There are some substances, however, which can change from one state to another even if there is no change in temperature. No new substance is formed when substances change from one state to the other. Substances can change from one state to the other when they gain heat. Heat causes solids to melt into liquid. When candle wax or shea butter is heated it melts. This is the same substance which has changed from solid state to liquid state. Substances can also change from one state to the other by losing heat. When water vapour (gas) loses heat, it changes into liquid (water). When water is put into refrigerator, it loses heat and becomes cold and finally freezes to form ice which is solid.

Examples of every occurrences in which no new substances are formed include:

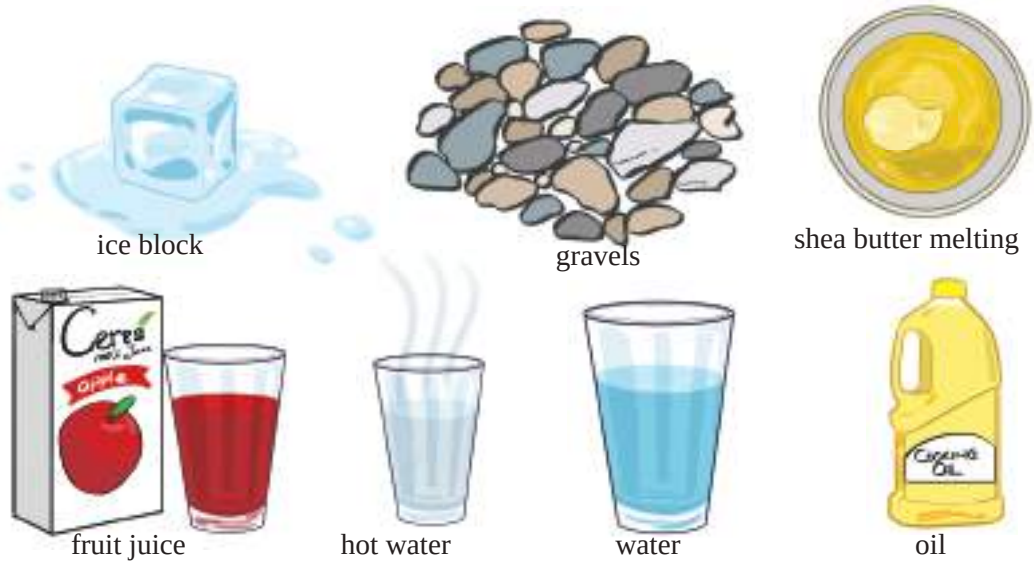
- freezing and melting of yoghurt and ice cream.
- freezing of water to form ice.
- melting of ice block into water.
- condensation of water vapour into liquid water.
- evaporation of perfume when sprayed on the body.
- blending of tomato in a blender.
- melting of gold by goldsmith.
- melting of iron by blacksmith.

Starting the lesson

Draw the attention of the learner to an experience he or she had the previous day when he or she bought yoghurts the previous day which was very hard. Teacher continues by saying he or she forgot the yoghurt on a centre table and went to sleep. He or she later found that it became water soft and watery. Teacher tells learners to explain what happened to the yoghurt.

Begins this lesson by showing to learners, pictures or videos of solid, liquid and gases. Teacher makes learners aware that the materials around them are solids, liquids or gases.

Proceed to show to learners samples of solid substances such shea butter, water in a cup, candle wax and ice block displayed on his or her table.
Tell learners to watch the physical state of each of these substances.
Ask learners whether the substances shown to them are are they solids, liquids or gases.
Refer learners to page 32 of pupils' textbook 3 for the picture.



Activity: 1.2.1.3a: Demonstrating the change of liquid to gas and gas to liquid

Materials/Resources (Low or no cost): water, beaker and a source of heat

Procedure

- Give to learners water, beaker and a source of heat
- Tell learners to pour water about 1/3 full into a beaker
- Assist learners to place the beaker of water on a source of heat to start heating.
- Tell learners to allow the water to heat till it begins to boil
- Tell learners to observe and discuss among their classmates
- Tell learners to cover the beaker with a clean dry lid for two minutes
- Tell learners to remove the lid, observe and discuss their observation with your classmates

Activity: 1.2.1.3b: Demonstrating the change of solid to liquid

Materials/Resources (Low or no cost): candle wax or shea butter, beaker and heat source

Procedure

- Give to learners candle wax or shea butter.
- Tell learners to write down the state in which the candle wax or shea butter is
- Tell learners to put the candle wax in a beaker
- Assist learners to place the beaker containing the candle wax or shea butter on a source of heat to start heating.

- Assist learners to continue heating till the candle wax or shea butter is no longer solid.
- Ask learners into what state the candle wax or shea butter changed to.
- Tell learners to allow the candle wax or the shea butter in the current state to cool.
- Ask learners into what state the candle wax or shea butter changes to after cooling.
- Tell learners to discuss the changes in state among their classmates
- Pay attention to learners discussion and finally elaborates their ideas on about how substances change from one state to the other

Summary

- No new substance is formed when substances change from one state to the other.
- Substances can change from one state to the other when they gain heat.
- Heat causes solids to melt into liquid.

Diagnostic assessment

1. What do you think will happen if ice cubes are heated for a long time?
2. Why do people put ice blocks into ice chest and cover it well?

Progressive assessment

1. How will you be able to change the following substances into liquid within five minutes?
   i. ice block
   ii. shea butter
   iii. rain water
2. How will you be able to change the following substances into solid within five hours?
   i. water
   ii. palm oil
   iii. shea butter

Answers to Diagnostic assessment

1. It will melt and change into liquid water. If the heating continues the liquid water will change into water vapour which is a gas
2. This is because heat does not easily enter the ice chest. The ice block will not melt easily to turn into liquid water.

Answers to Progressive assessment

1. i. By putting it in a container and applying heat to it
   ii. By putting it in a container and applying heat to it
   iii. It is already liquid and nothing can be done to it
2. How will you be able to change the following substances into solid within five hours?
   i. By putting it in a deep freezer
   ii. By putting it in a deep freezer
   iii. It is already solid and nothing can be done to it

Answers to Study Questions

1. (i) water to ice, liquid shea butter to shea butter
   (ii) steam to water
2. Copy and complete the following table by writing the state against the materials

Material	**Sate**
Key holder	Solid
Shea butter	Solid
Water vapour	Gas
Cube of sugar	Solid
Water	Liquid
Petrol	Liquid

3. i) liquid to solid
   ii) gas to liquid
   iii) liquid to gas
   iv) solid to liquid

STRAND 2: CYCLES

SUB-STRAND 1: EARTH SCIENCE

LESSON 1: SOME CYCLIC EVENTS THEIR INTERVALS/PERIODS

Content Standard: B3.2.1.1 Describe some cyclic events like day and night, wet and dry seasons and their intervals/periods.

Core Competencies: Collaboration and Communication, Personal Development and Leadership, Cultural Identity and Global Citizenship, Creativity and Innovation.

Expectations: At the end of this lesson you will be able to:

- find out cyclic events from their homes
- mention the importance of some cyclic events
- identify some activities associated with cyclic events.
- draw any of the cycles e.g. day and night, wet and dry seasons

Subject Specific Practices: Communicating, Analysing, Evaluating.

Resources: Globe, flashlight, charts of sun and earth

Reference: Learners Book 3 page 41 - 47

Introduction

The sun is in a fixed position but the earth moves round it. The earth also rotates about on its axis. It also takes the earth 365 ¼ days to more round the sun. Such events that repeat themselves are many in nature and in out everyday living. We wake up in the morning and see the sun. Later in the evening the sun appears to have gone away. We celebrate our independence day once every year. It repeats itself the following year. Such events are said to be cyclic and repeat themselves.

Indicators and exemplars: B3 2.1.1 Recognise that some events in our environment occur recurrently.

Key Words: Seasons, dry, wet, day, night, cycle.

Additional Information:

We wake up in the morning and see the sun appearing from the east. Sooner or later, it appears to have moved across the sky to the west and disappears. The same thing happens daily. It repeats itself. During the day, we work, and rest and sleep at night. It keeps on repeating itself. The earth moves round the sun. Sometimes it is close to the sun and other times it is far away

from the sun. This movement results in seasons. There are wet and dry seasons. We plant our maize when the rains start and harvest when the weather becomes dry. It repeats itself every year. These are referred to as cyclic events.

Starting the lesson

Materials/Resources (Low or No cost): Globe, flashlight, charts of sun and earth

Procedure
Start the lesson by asking learners to recollect the activity they performed in primary one when they sat in a merry-go-round. Ask them how it moved. Remind them that such movements are known as cyclic movements.
Explain that the sun is surrounded by planets which also move in a cyclic manner.
Remind them the earth is one of the planets and also rotates on its axis.

Activity B3.2.1.1.1 To demonstrate that the sun is at a fixed position. (Group work)
One pupil in each group stands at a centre and another pupil moves round the first one representing the sun.

Move and observes how the learners perform the activity.
Call the attention of the learners to the diagram illustrating Sun and Earth and the flashlight and the earth.

To demonstrate day and night
Lead the demonstration. Again in their groups, two leaners, one representing the sun which is fixed and the other, the earth which rotates around its axis.

Explain that apart from moving round the sun, the earth also rotates round its axis causing day and night.

Learner representing the earth rotates as well as moving round the sun. The side facing the sun is day and the other side is night. As one part of the earth experiences day, another part experiences night and there is no light but darkness.

Wet and Dry season.
Explain to class how the seasons are caused. As the earth revolves round the sun, winds either blow from the sea towards the land or from the dessert towards the sea. When the wind is blowing from the sea, we have the wet season but from the dessert towards the sea, causes the dry season. The continuous revolution of the earth causes dry and wet season and is repeated yearly.

Going to school is also a cyclic movement. Teacher explains to learners. Teacher explains that celebration of independence day repeats itself every year on the 6th of March. It is therefore a cyclic movement.

Summary

- There are several cyclic events in nature.
- Different activities occur during each part of a cycle.
- Day and night, wet and dry seasons, going to school, Independence day celebration all occur at certain times of the year.

Diagnostic assessment

1. Which body moves, the sun or the earth?
2. Which body is stationary?

Progressive assessment

1. The motion of the earth can be described as?
2. The path in which the earth moves round the sun is called its _____.

Answers to diagnostic assessment

1. The earth moves
2. The Sun

Answers to Progressive assessment

1. Cyclic
2. Orbit

Answers to Study Questions

1. (i) cycle (ii) day (iii) night (iv) wet (v) dry
2. (i) sunset (ii) orange or yellow (iii) day (iv) night
3. (i) earth sun (ii) rotation (iii) day and night (iv) dry and wet season
4. (i) true (ii) false (iii) true (iv)false

STRAND 2: CYCLES
SUB-STRAND 1: EARTH SCIENCE

LESSON 2: IMPORTANCE OF THE SUN TO THE EARTH

Content Standard: B3.2.1.2 Recognise the relationship between the Earth and the Sun

Core Competencies: Collaboration and communication Personal Development and Leadership, Cultural Identity and Global citizenship

Expectations: At the end of this lesson you will be able to:

- perform outdoor activities to illustrate the importance of the sun.
- outline everyday uses of the sun.
- draw a picture showing one benefit of the sun to life on earth (drying of clothes).

Subject Specific Practices: Communicating, Analysing, Evaluating, Observing

Resources: a biconvex lens, A4 sheet of paper and handkerchief.

Reference: Learners Book 3 page 48 - 52

Introduction

The sun is a ball of burning gases in space. Thermonuclear reactions take place in the sun. These reactions produce different types of radiations. The radiations are transmitted through space to the earth. Some of the radiations are beneficial to life on earth. Others are dangerous to life on the earth. Most of the dangerous ones are removed in the ozone layer of the atmosphere. The beneficial radiations include heat and light. Heat radiations keep the earth warm whilst light radiation enables animals with eyes to see and move about. It enables green plants to make their food which is also available to animals.

Indicators and exemplars: B3.2.1.2.1: Importance of the sun to the Earth

Key Words: sun, earth, uses of the sun, drying of clothes, warmth, radiation

Starting the lesson

Start lesson by revising what learners learnt in Basic 2 about the sun being fixed and the planets moving round them.

Emphasizes that the sun is the main source of energy on the earth.

Activity B3.2.1.2.1 (a) Outdoor activities to show the importance of the sun. (Burning of Paper)

In their groups, give each group a biconvex lens and an A4 paper.

Direct the learners to follow the steps in their textbook.
Move among the groups to observe the way they go about the activity.
Lead the learners to draw their conclusion and explain their observation. If done well the paper will not burn.

Activity B3.2.1.2.1 (b) Drying of washed clothes
Ask learners to bring water and a handkerchief per group to school the previous day for the activity.
One person in each group washes the handkerchief or a piece of cloth. The learners dry the handkerchief in the sun for about one hour and explain their observation.
Lead the discussion on the results of two activities. The learners should draw their own conclusions.
Everyday uses of the sun.
Lead the discussion on everyday uses of the sun by questions such as what do we use the sun's energy for?
Explain that plants use the sunlight in making their food which is made available to animals including man. Learners should see the importance of the sun from the discussion.

Summary
- The sun makes life on Earth possible by giving the Earth heat.
- The Earth would have been very cold but for the sun's heat.
- The sun also gives sunlight which enables plants to make their food and also animals to feed on plants.

Diagnostic assessment
1. The general name of bodies that move round the sun is ____
2. The path of these bodies is called?

Progressive assessment
1. State one benefit of the sun to living organisms on earth
2. Can there be life on earth without the sun?

Answers to diagnostic assessment
1. Planets
2. Orbits

Answers to Progressive assessment
1. Living things obtain all their energy from the sun.
2. No, there will be no life on earth without the sun

Answers to Study Questions

1. (i) fixed (ii) moves (iii) planet (iv) a star
2. (i) heat and light (ii) warm (iii) light, food (iv) planets
3.
    - Gives light to humans to see.
    - Makes the earth warm.
    - Green plants to make their food which is used by humans.

STRAND 2: CYCLES
SUB-STRAND 1: EARTH SCIENCE

LESSON 3: TYPES OF PRECIPITATION

Content Standard: B3.2.1.3 Show understanding of the roles of condensation, evaporation, transpiration and precipitation in the hydrological (water) cycle

Core competencies: Collaboration and communication, Personal Development and Leadership, Cultural Identity and Global citizenship, Creativity and Innovation

Expectations: At the end of this lesson you will be able to:

- mention the different types of precipitation
- to explain each terms rain, snow, hail, sleet
- tell the differences between rain, snow, hail, sleet
- build vocabulary on precipitation.
- match pictures showing different types of precipitation with their correct names.
- draw a picture showing a rainy day.
- do Project to create artificial rain in the school

Subject Specific Practices: Observing, Communicating, Analysing, Evaluating

Resources: video and the pictures or cut-out pictures of forms of precipitations

Reference: Learners Book 3 page 53 -58

Introduction

Rainfall is a common natural occurrence. There is a saying that the sun shines after the rain. Learners know of iced water, 'ice block' and rainfall in the previous lesson in B1.2.1.3.1. Rainfall is not the only phenomenon which involves water falling from the clouds. Water can fall from the sky in different forms apart the liquid water. Once the learner knows that water can exist in the form of ice blocks, he or she can also appreciates the fact that water falling from the sky can also be in different forms. This depends on the condition prevailing in the clouds.

Indicators and exemplars: B3.2.1.3.1 Identify the types of precipitation(rain, snow, hail, sleet) and describing the differences among them

Key Words: precipitation, snow, hail, sleet

Additional Information

The learners drink ice water. They also see ice block most of the time. They also see rain falling. It is not only rain that falls from the clouds. There are other things that fall from the clouds just like rain. They include snow, hail and sleet. Sleet is ice pellets that fall from clouds. Hail is a

small hard ball of ice that falls from the sky like rain. It usually falls during rainfall. Snow refers to forms of ice crystals that fall from the clouds in the atmosphere.
Rain is drops of liquid water that fall from the clouds when water vapour condenses to form liquid. Rain, snow, hail and sleet are all forms of precipitation. Some of these forms of precipitation do not occur in Ghana but in other places. In Ghana we only experience rainfall which occurs at certain seasons of the year. Rainfall can be in a form of drizzles or torrents. Drizzles are small drops of water from the clouds which results in slight rain. Torrential rains are heavy rains which can cause flooding.

Starting the lesson

- Start this lesson by preparing their mind with the following questions:
- Is it possible to see ice blocks falling during rainfall? Have you seen any other thing falling from the clouds like rain before? How does water become ice block? Can ice block form in the clouds like how it forms in a deep freezer in your home?
- Give to learners in groups of four or five flash cards of the various precipitations. Teacher tells learners to match the flash cards of the precipitations with their correct names.
- Show to learners the video and the pictures or cut-out pictures of forms of precipitations and tells them to tell their classmates what they have seen.
- Refer learners to page 54 of pupils' textbook 3

Tell learners to draw a picture of rainfall in their exercise book

Project: *Teacher assists learners to undertake an activity to create artificial rain in the school.*

Summary

- Rain is drops of liquid water that fall from the clouds when water vapour condenses to form liquid.
- Sleet is ice pellets that fall from clouds.
- Hail is a small hard ball of ice that falls from the sky like rain. It usually falls during rainfall.
- Snow refers to forms of ice crystals that fall from the clouds in the atmosphere.

Diagnostic assessment

1. Write down three types of precipitation
2. Which type of precipitation occurs in Ghana?
3. Which type of precipitation does not occur in Ghana?
4. Which type of precipitation can cause flooding?

Progressive assessment

1. The black clouds have gathered in the sky. It was in June.
   i. What do you think is likely to happen?
   ii. What is the general name given to what you think will happen?
   iii. Write down three types of what you think will happen

Answers to Diagnostic assessment

1. Rain, snow, hail
2. Rain
3. Snow, hail and sleet
4. Rain

Answers to Progressive assessment

i. It will rain
ii. Precipitation
iii. Rain, snow, hail

Answers to Study Questions

1. 

   Accept any appropriate drawing
2. Snow, Hail, Sleet
3. Snow
4. rain, slect, hail, snow
5. Rain – drops of liquid water
   Snow – small ico crystals
   Sleet – ice pellets
   Hail – small hard ball of ice.

STRAND 2: CYCLES
SUB-STRAND 1: EARTH SCIENCE

LESSON 4: THINGS THAT MAKE WATER IMPURE

Content Standard: B3.2.1.4 Recognise water and air as important natural resources

Core Competencies: Collaboration and communication, Personal Development and Leadership, Cultural Identity and Global citizenship

Expectations: At the end of this lesson you will be able to:

- observe the pictures and communicate their ideas on what makes water impure.
- observe littered parts of the school community
- identify things that make water impure.
- say what will happen if they drink impure water.

Subject Specific Practices: Observing, Communicating, Analysing, Evaluating

Resources: Cut-out picture of a community with a lot of rubbish littered around which should include empty sachet, goat droppings, dead and decomposing dog or any animal, empty insecticide container.

Reference: Learners Book 3 page 59 - 66

Introduction

Interacting and dealing with materials in our environment, you will recognise that water and air are also materials which are important natural resources. The learner, knowing this, has to be made to understand that the purity of these materials is also very important, especially in a country where we are battling with the problem of pollution. The learner at this stage has to be made to be able to identify things that make water impure.

Indicators and exemplars: B3.2.1.4.1 Identify things that make water impure

Key words: flooding, impure, mining, littering, pesticides, fertilizer, chemicals, improper, disposal, industrial, wastes

Additional Information

All living things need water. Human beings also need water since we are also living things. Water is therefore a very important natural resource. Most often water is not found in a pure state. Water is a universal solvent. This makes almost everything dissolve in it. It is therefore very important to make sure that you do not throw anything in any water body. The things that you throw into the water bodies will either dissolve in it completely or to some extent and they

come back to enter your body when you drink from those water bodies. If you destroy the water bodies by throwing anything into them, you will end up destroying yourself. You learnt about qualities of good drinking water in Basic two. There are certain things that make water impure. Most often water becomes impure through the following human activities:

Leakages: Pipes and storage tanks that carry petroleum product can develop cracks and the oil will leak into water bodies. Pipes which carry waste substance can also leak into water bodies to make them impure.

Flooding: Flooding during rainy season, carries waste substances which are deposited into water bodies. The water in Korle lagoon and Odaw river in Accra have been made impure because of this.

Industrial waste dumped into water: Some industries (factories) also produce waste substances which are discharged into water bodies. For example textile industries discharge dyes and other chemical into water bodies close to them. Some slaughter houses also discharge their waste into gutters which enter water bodies.

Mining: In order to get the fine metal out from the sand, chemicals are added which are washed into rivers and other water bodies. Illegal mining in Ghana (Galamsey) also discharge chemicals (mercury) into water bodies. River Pra and River Birim are examples of water bodis in Ghana that have polluted by illegal miners

Littering: People throw rubbish into their surroundings and gutters. When rain falls they are washed into rivers and water bodies. Some people throw the rubbish directly into the rivers and other water bodies which makes the water impure. We must learn to avoid these things. Pesticides application: Farmers apply pesticides to their crops to kill pests which destroy crops. The pesticides are washed into surrounding water bodies during rainfall.

Fertilizer application: Farmers also apply fertilizers to the soil in their farms to provide nutrients to the crops to make them grow well to increase their yield. These fertilizers are washed into surrounding water bodies during rainfall.

House hold chemicals: Some chemical are used in our homes. Some of these chemicals include shampoos, liquid soap, mosquito spray and many others. These chemical flow into gutters and finally end up in water bodies.

Improper disposal of animal wastes: Animal wastes from people who rear animals also dispose of the waste of those animals in an improper manner which finally ends up into water bodies. Examples are piggeries, poultry farms and cattle ranches.

Starting the lesson

- You can draw the attention of the learners by drinking pure water and telling them to watch. Then ask learners whether the water he or she is drinking is pure or impure.
- Start this lesson by telling learners to organise themselves into groups
- Show to learners cut-out pictures showing how water is polluted.
- Make sure that these cut-out pictures include leakages, flooding during rainy season which carries waste deposits into water bodies, industrial waste dumped into water, mining, littering, pesticides application, fertilizer application, house hold chemicals and improper disposal of animal wastes.
- Tell learners to observe the cut-out pictures shown to them very well in their groups.
- Proceed to ask learners what they think makes water impure.
- Lead learners out of the classroom to observe littered parts the community.
- Ask learners to identify things in that part of the community that can make water impure.
- Ask learners what they think will happen to them if they drink impure water.

Summary

- All living things need water.
- Human beings also need water since we are also living things.
- Most often water is not found in a clean state.
- There are certain things that make water impure.

Diagnostic assessment

1. Write down three things that will make water lose its qualities as good drinking water.
2. Name three household chemicals that can make water impure

Progressive assessment

Your hometown is sited close to a river which serves as a source of water to the community.

i. What do you think will happen to the water in the river?
ii. What single advice will you give to people in your hometown if you were given the chance to do so?

Answers to Diagnostic assessment

1. Tasteless, colourless, odourless, free from particles
2. shampoo, mosquito spray, liquid soap

Answers to Progressive assessment

i. Bad taste, coloured, particles present, smells
ii. To avoid dumping waste substances into the water bodies

Answers to textbook questions

1. Improper disposal of animal waste, mining, fertiliser application
2. The fertilizers are washed into surrounding water bodies during rainfall.
3. Yes. It enters gutters and when it rains they are washed into water bodies which makes them unclean.
4. The mining companies use chemicals which are washed into rivers and other water bodies to pollute them. When I drink water from the river, I will fall sick. When I eat fish from those water bodies I will also fall sick. When farmers use water from those water bodies to water their vegetables I will fall sick when I eat the vegetables.
5. River Pra, Korley lagoon etc (depending on teachers locality)

STRAND 2: CYCLES
SUB-STRAND 1: EARTH SCIENCE

LESSON 5: PROPERTIES OF AIR

Content Standard: B3.2.1.4 Recognise water and air as important natural resources

Core Competencies: Collaboration and communication, Personal Development and Leadership, Cultural Identity and Global citizenship

Expectations: At the end of this lesson you will be able to:

- perform a simple demonstration on the properties of air, e.g. air has mass, occupies space, made up of more than one gas, pulls and pushes objects.
- demonstrate how to make more air enter your classrooms in groups.

Subject Specific Practices: Observing, Communicating, Analysing, Evaluating

Resources: balloons of equal size, thread and a chemical balance, umbrella, water, matches, candle, gas jar, water trough, empty bottle, water

Reference: Learners Book 3 page 67 - 72

Introduction

Having established the fact that we need to identify the things that make water impure, we also need to consider air to as a very important resource which also has to be kept pure. Before we do that it is necessary to talk about the properties of air.

Indicators and exemplars: B3.2.1.4.2 Describe the properties of air

Key words: Environment, sweeping, weeding, scrubbing, clean, brooms, mops, dusters, detergents

Additional Information

Air is an important natural resource which all living things need. It is found everywhere in our environment. You cannot see air but it exists. Strong winds blow and remove the roofs of some building. You will only see the roof being ripped off but you will not see the wind doing it. This shows the air can apply a force on things. The air helps to lift things up. Aeroplanes are able to fly by the help of air. Birds also fly and soar in the sky by the help of air. The same applies to drones and kites in the sky. Air is also a mixture of gases. Oxygen in the air enables things to burn. Carbon dioxide in the air does not allow things to burn. The knowledge of this makes people make fire extinguishers to enable us quench fires.

Air has mass

All substance can be weighed. This means that all substances have mass. Air is a substance and has mass. When a balloon is inflated it becomes heavier than when it is deflated.

Air occupies space

Air is a substance. All substances occupy space. Since air is a substance, it also occupies space like any other substance. An empty bottle is actually not empty because it contains air

Air is made up of more than one gas

Air does not consist of only one gas. It is consists of other gases. These gases include oxygen, nitrogen, carbon dioxide, rare gases and water vapour.

Air pulls or pushes objects

Air particles move in all directions. Air in motion is called wind. Air in motion can push or pull objects. This is why when there is a strong it can push trees to fall down.

Starting the lesson

Start this lesson by using a card to fan himself or herself and draw learners attention to it ask them why he or she is doing that. Based on the response of the learner, the sub-strand is introduced.

Activity 2.1.4.2.1 Air has mass

Materials/Resources (Low or no cost): balloons of equal size, thread and a chemical balance

Procedure

- Give to learners in groups of four or five balloons of equal size, thread and a chemical balance.
- Tell learners to weigh the balloon and the thread and record your results.
- Tell learners to blow air into one of the balloons and tie its open end with a string.
- Tell learners to weigh the inflated balloon and record their results and discuss their observation with their group members.

Activity 2.1.4.2.2 Air occupies space

Materials/Resources (Low or no cost): water trough, empty bottle, water

Procedure

- Give to learners water trough, empty bottle, water
- Tell learners to turn the empty bottle upside down and dip it completely into water and hence turn the mouth of the bottle up quickly.
- Tell learners to observe what happens and hence discuss their observation with their classmates.

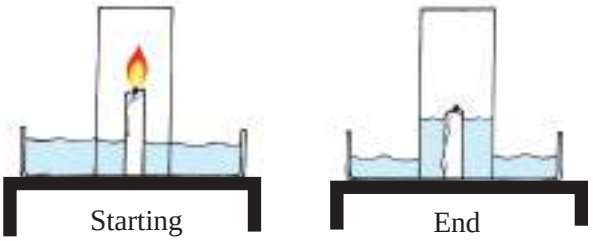
Activity 2.1.4.2.3 Air is made up of more than one gas

Materials/Resources (Low or no cost): Water trough, water, matches, candle, gas jar

Procedure

- Give to learners water trough, water, matches, candle and gas jar
- Tell learners to place the water trough on a table
- Tell learners to stick the candle in the water trough

- Tell learners to pour water to about 1/3 full into the water trough
- Tell learners to lit the candle
- Tell learners to turn the jar over the candle
- Tell learners to observe and discuss among their classmates

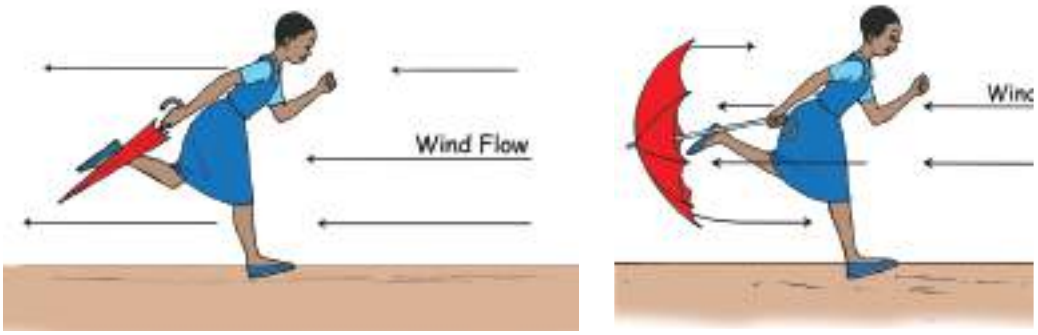


Thinking time: *A lorry tyre is inflated with air. What gases are in the lorry tyre?*

After the activity, teacher asks learners why the water did not rise up the gas jar to fill it completely during the activity. Teacher guides learners to draw conclusion that it is because there are other gases apart from the gas that causes things to burn. Oxygen is the gas that causes things to burn. Once the oxygen is used up to burn the candle, the fire goes off. They can finally conclude that air is a mixture of gases.

Activity 2.1.4.2.4 Air pulls or pushes objects
Materials/Resources (Low or no cost): umbrella
Procedure

- Tell learners to hold a closed umbrella behind them and run against the direction of the wind
- Tell learners to open the umbrella and run against the direction of the wind.
- Tell learners to compare the effect of the wind in both cases
- Tell learners to discuss their observations with their classmates



Direct leaders of each group to lead discussion about the activity carried out to establish the fact that when the umbrella was opened behind the pupil, he or she could run freely against the direction of the wind flow. The wind entered the umbrella and tried to pull it out of his or her hand. He or she could not run as fast as he or she would have done with the umbrella closed. The air was pulling the umbrella. Teacher guides learners to conclude that air can pull or push an object.
Explain to learners that tying one end of a piece of cloth around the waist and holding the other end with the hands and running against the direction of the wind flow will achieve the same purpose.

Guide learners to conclude that they cannot see air but it pulls or pushes objects.
Ask learners to state how they can show that there is air in their classroom. Teacher guides and expects learners to say it is by moving a sheet of paper across their face which will blow the air which hits their face and they feel its effect.

Activity 2.1.4.2.4 Demonstrating how to make more air enter classrooms in groups.
Materials/Resources (Low or no cost): no materials required
Procedure
Tell learners in groups of four or five, to discuss how to make more air enter their classroom.

After the discussion engages learners in the following activities and tells them to write down their observation in each case:

Teacher tells learners to:
- close all the windows and doors of their classroom.
- wait for five minutes.
- open one door of the classroom and wait for five minutes.
- open two doors of the classroom and wait for five minutes.
- open all the doors and one window of the classroom and wait for five minutes.
- open all the doors and all the windows of the classroom and wait for five minutes.
- take an exercise book or card and wave it across their face
- let each group now discuss how to make more air to enter the classroom
- let each group present their findings to the whole class.

Summarise the activity that they can make more air enter their classroom by opening all door and windows. They can also do so by making sure there is fan in the classroom.

Summary
- Air is a substance.
- Since air is a substance, it also occupies space like any other substance.
- You cannot see air but see its pull or push on objects.
- You can show that there is air in your classroom by moving a sheet of paper across your face.

Diagnostic assessment

1. Write down three properties of air
2. Which property of air enables vulcanisers to inflate lorry tyres?
3. Strong winds carry peoples' items away. Mention the property of air that enables air to do that

Progressive assessment

1. When you dip an open bottle into a bucket of water
   i. what happen to the water?
   ii. What happens to the air?
   iii. What property of air can describe?

Answers to Diagnostic assessment

1. Air has mass, air occupies space, air helps things to burn
2. Air occupies space
3. Air pulls or pushes objects

Answers to Progressive assessment

1. (i) Water rushes into the bottle
   (ii) Air rushes out of the bottle
   (iii) Air occupies space

Answers to Study Questions

1. Air exerts a push or a pull on objects. Air occupies space.
2. How to show that air can pull or push on an object.
   Hold a closed umbrella behind you and run against the direction of the wind. Open the umbrella and run against the direction of the wind. Compare the effect of the wind in both cases.
3. By opening the windows and doors.
   By removing all objects that block the air.
4. Experiment to show that air helps things to burn. Experiment to show that air has mass and occupies space

STRAND 2: CYCLES
SUB-STRAND 1: EARTH SCIENCE

LESSON 6: GERMINATION OF MAIZE AND BEAN SEEDS IN WATER

Content Standard: B3.2.2.1 Demonstrate understanding of life cycle of a plant

Core competencies: Collaboration and Communication, Critical Thinking and Problem Solving, Personal Development and Leadership, Creativity and Innovation

Expectations: At the end of this lesson you will be able to:

- predict whether it is possible for bean and maize seeds to germinate/sprout in water without soil.
- plant maize and bean seeds in water and without water in transparent glass or plastic containers.
- observe germination of maize and bean seeds planted in water and without water.
- compare maize and bean seeds planted in water with one planted without water.

Subject Specific Practices: Observing, Classifying, Predicting, Analysing, Evaluating

Resources: two transparent glasses or plastic containers,, cotton wool, water and viable maize and bean seeds.

Reference: Learners Book 3 page 73 - 77

Introduction

Air and water which are important natural resources plays important role in the life cycle of plants. The learner knows about the things that make water impure and the properties of air in the previous lesson. The learners will therefore appreciate the fact that the water and the air they learnt about are conditions necessary for germination.

Indicators and exemplars: B3.2.2.1.2 Observe the germination of maize and bean seeds in water.

Key words: ggerminate, viable, conditionss

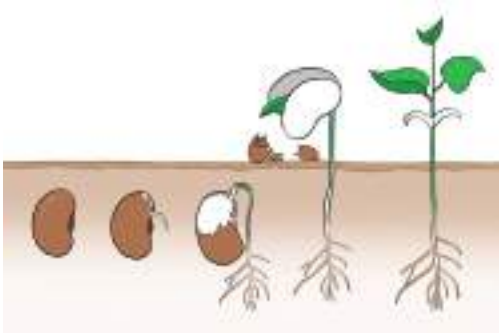
Additional Information

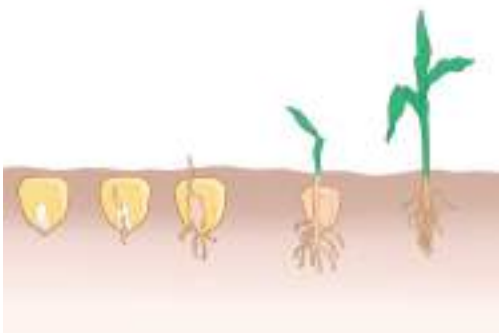
Germination is the coming out of the embryo (new developing plant) from a seed when some conditions are met. A seed will germinate only if it is viable (living). There are other conditions that must be met. In our environments, our parents plant maize and bean during particular seasons of the year. Usually the planting starts when the rain begins to fall. The rain provides the necessary conditions

- moisture or water in the soil

- suitable temperature (not too low or too high to kill the seed)
- presence of air

For maize and bean seeds to germinate the above conditions must be available. Maize and beans starts swelling before they germinate. This is because they first absorb water. The water is needed inside the maize grain or the bean seed to cause certain changes which are needed for germination to take place.





Starting the lesson

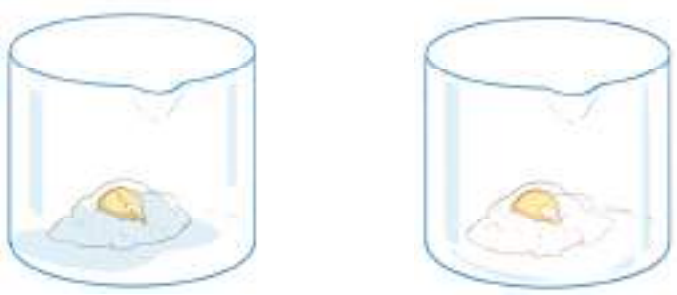
Start this lesson by challenging learners with question about whether it is possible for seeds such as beans and maize to germinate when there is only water available but no soil.

Activity 2.2.1.2 To show that viable seeds need water to germinate

Materials/Resources (Low or no cost): two transparent glasses or plastic containers (labelled A and B), cotton wool, water and viable maize and bean seeds.

Procedure

- Give to learners in groups of four or five the following items: two transparent glasses or plastic containers (labelled A and B), cotton wool, water and viable maize and bean seeds.
- Tell learners to pack container A with the cotton wool and push one of each of the different seeds through the side of the container but not to touch the bottom.
- Tell learners to pour a little water to soak the cotton wool.
- Tell learners to leave the set-up to stand for one week while keeping the cotton wool always wet.
- Tell learners to prepare container B using the same method but with a dry cotton wool.
- Tell learners to observe the set-up critically and record whatever they see.
- Ask learners what made the seeds germinate in set-up A.
- Ask learners why seeds in set-up B did not germinate.



Show to learners diagrams on page 75 of pupils' textbook which shows viable seeds placed in two containers under different conditions. In container A, the bean and maize seeds will germinate because all the conditions necessary for germination were present. Teacher explains that these conditions are:

- moisture or water
- air
- adequate (not high or low) temperature.

Explain that in container B, the cotton wool is not soaked in water. The bean seed will not germinate because there was no water available for its germination.

Guide learners to conclude that the experiments in containers A and B show that water is necessary for a viable seed to germinate.

Summary

- Germination is the coming out of the embryo (new developing plant) from a seed when some conditions are met.
- Seeds will germinate only if they are viable (living).
- Seeds also need the following conditions to germinate: moisture or water in the soil, suitable temperature (not too low or too high to kill the seed), presence of air

Diagnostic assessment

1. Can roasted maize germinate? Why?
2. Can maize grains left in your pocket for one week germinate? Why?

Progressive assessment

1. The polythene bag in which one olonka of beans bought from the market was torn on the way home and the beans scattered on the floor. Only some were collected. What are the conditions that they need to germinate?

Answers to Diagnostic assessment

1. No. It is dead and not viable
2. No. There is no moisture (water) in the pocket.

Answers to Progressive assessment

Air, moisture(water), adequate (not high or low) temperature.

Answers to Study Questions

1. Germination is the coming out of the embryo (new developing plant) from a seed when some conditions are met.
2. Viability, moisture or water, air and adequate (not high or low) temperature.
3. Conditions necessary for a seed to germinate are viability of the seed, moisture or water, air and adequate (not high or low) temperature only. Soil is not included
4. 

STRAND 3: SYSTEMS

SUB-STRAND 1: THE HUMAN BODY SYSTEM

LESSON 1: EXTERNAL PARTS OF THE HUMAN BODY AND HOW THEY WORK TOGETHER

Content Standard: B3.3.1.1 Recognise that different parts of the human body work interdependently to perform a specific function

Core Competencies: Critical thinking and Problem Solving, Collaboration and communication, Personal Development and Leadership

Expectations: At the end of this lesson you will be able to:

- engage pupils in songs on the various parts of the body, e.g. head, shoulders, knees and toes, show me your head, my head, my shoulders my knees, my toes.
- share ideas after thinking about how the various parts of the human body support each other to perform various functions.
- engage in various activities such as skipping), playing football and ampe
- explain how the various parts of the body contribute to undertake the activity successfully.
- mention the fact that fact that every part of the body is important and must be taken care of.

Subject Specific Practices: Observing, Analysing, Evaluating

Resources: A chart of the human body showing parts labeled

Reference: Learners Book 3 page 79 - 83

Introduction

Every living thing has a body. The body of every living thing has parts. Human beings have body. The body of human beings have parts. The parts of the body of living things work together (interdependently) to perform specific function. The parts of the body of human beings also work together (interdependently) to perform specific functions.

Indicators and exemplars: B3.3.1.1.1 Explain that the external parts of the human body work interdependently to perform a function.

Key Words: head, neck, eyes, ears, feet, hands, abdomen, nose, mouth

Additional Information

The human body has both internal parts and external parts. You cannot see the internal parts even though they exist. The internal parts work interdependently to perform a certain function. The human body has both internal parts and external parts. You cannot see the internal parts even though they exist. The internal parts work interdependently to perform a certain function. The external parts also work interdependently to perform a particular function. Without the internal parts, the external parts cannot work. Each external part of the body performs a specific function. The legs are used for walking, jumping, running, swimming, kicking football and many other activities. The arms are also used for holding things, lifting things, pushing and pulling things.

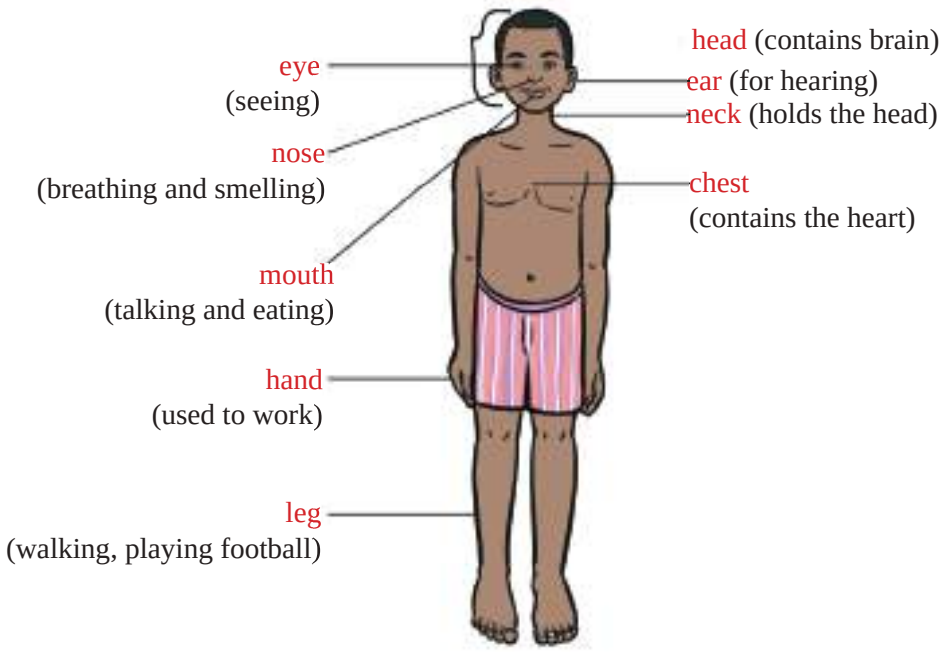
If you are going to school, it is not only the legs that help you to wall to get to the school. The eyes see the way to enable you walk to school. Your arms help you to carry the bags to school. The nose helps you to breathe air to enable you get to school. You will realise that each part of the body performs a specific function, they must all act together to perform a particular function. In playing football, with your nose you breath air, with the eye you see the ball, with your legs you run towards the ball, with your hands you throw in the ball into play, with your ear you hear the whistle or your team members calling you to pass the ball , with your leg you kick the ball.

Starting the Lesson

Start the lesson by engaging learners in songs on the various parts of the body. The learners points to the various parts of the body as they sing.

An example of the song is as follows:
I am a human being.
I have a head, neck and two hands.
I am a human being
I have a chest, abdomen and two ears.
I am a human being.
I have mouth, a nose, two eyes and two legs.
These are the parts of my body.
My abdomen contains my stomach. I cannot see it.

Continue to engage learners to brainstorm on how the various parts of the human body support each other to perform various functions, for example assuming a dog is barking towards you, how do the eyes, ears, feet help you to recognise danger and escape?
Teacher shows to learners pictures on page 80 in pupils' textbook 3



Teacher tells learners to mention the parts of the body involved in the following activities.

- thinking
- hearing
- carrying the head
- eating
- working
- seeing
- containing the heart
- breathing
- containing the stomach
- walking

Teacher tells learners in groups of four or five to discuss with their group members the roles that the parts of the body play in

- playing football
- playing ampe
- skipping rope
- playing computer game

After the above discussion, help learners to conclude that

- every part of your body play an important role.
- many parts of your body work together in whatever you are doing?

Summary

- Every part of the human body is important.
- The various parts of the body include the head, shoulders, the hands, the chest, the abdomen, the legs, the knees and the toes.

- Various parts of the human body support each other to perform various activities.
- Examples of activities that parts of our body can act together to do include skipping, playing football, basketball, ludoo and ampe.

Diagnostic assessment

1. The human body has how many sense organs?
2. Write down the names of the sense organs the human body has.

Progressive assessment

1. To determine the sweetness of a substance which of the following activity will you perform?
   a. look at it.
   b. smell it.
   c. taste it.
2. The ear is one of the sense organs.
   a. False b. True

Answers to diagnostic assessment

1. Five (5)
2. a The eye – sight
   b. the tongue-taste
   c. the nose – smell
   d. the skin – touch and feel
   e. the ear – hearing

Answers to progressive assessment

1. Taste it
2. True

Answers to Study Questions

1. nose, eyes, legs throw in the ball into play, hear, legs.
2. ear, eye, legs, arm
3. Mention the functions of the following parts of the human body
   i. It supports the head
   ii. thinking and learning
   iii. walking and playing football
   iv. writing, clapping, holding things
4.
   i. The ear
   ii. The mouth
   iii. The hand
   iv. The arms and legs
   v. eyes

5.

i. ear, eyes (to read), nose(to breathe), the head(to think), the hand(to write)
ii. The legs because you do not have to move about. The mouth because you do not have to talk.

6. i) The ear (to hear instruction), the eyes (to read), nose(to breathe), the head(to think), the hand (to write)
ii) The legs because you do not have move about. The mouth because you do not have to talk.

STRAND 3: SYSTEMS

SUB-STRAND 2: SOLAR SYSTEM

LESSION 1: THE SUN, EARTH AND MOON AS PARTS OF THE SOLAR SYSTEM

Content Standard: B3.3.2.1.1 Know the sun, earth and moon as part of the solar system.

Core Competencies: Critical Thinking and Problem Solving, Communication and Collaboration, Personal development and leadership.

Expectations: At the end of this lesson you will be able to:

- watch pictures of parts of the solar system containing the sun, earth and moon.
- engage in a recital of the poem "I see the moon, and the moon sees me".
- identify the sun, moon and earth in the pictures.
- mention the uses of the sun and moon.
- say that the earth moves around the sun, and the moon moves around the earth.
- engage in an activity to role play the movement of the earth around the sun, and the moon around the earth.
- make a model of the solar system showing only the sun, earth and moon.

Subject Specific Practices: Observing, Classifying, Predicting, Analysing, Evaluating.

Resources: Charts of the solar system, Charts showing phases of the moon, Chart of planets arranged.

Reference: Learners Book 3 page 84 - 90

Introduction

We walk to school everyday. In the school garden, we grow plants. In the evening we see the moon and stars. In the morning we see the sun. The solid material we walk on and grow our crops is called the earth.

The earth, sun and moon together with other planets are called the solar system.

Indicators and exemplars: Show understanding of the orderliness of the sun planets and satellites in the Solar System as well as the important role of the sun in the Solar System.

Key words: Component, Solar system, satellite, Venus

Additional Information:
The solar system is made up of the sun at the centre and the planets in their different orbits moving around it. The moon and planets in the solar system do not produce their own light. An object can be seen when it reflects light or it is a source of light but the moon reflects light. Other planets such as Venus that can be seen also reflects sun's light. A satellite is a smaller heavenly body that moves around a planet. The stars can be seen because they produce their own light.

Starting the lesson
Materials And Resources (Low or no cost): Charts of the solar system, Charts showing phases of the moon, Chart of planets arranged.

Procedure:
Begin lesson by showing learners drawing or charts of solar system, sun earth and moon. Finds out which of the components move and which one does not move.
Let learners describe the structure of the solar system.

Activity B3 3.2.1.1 Observation of bodies in the day and night skies.

- Leads learners out to observe bodies in the day sky. Teacher advises them not to look at the sun directly.
- Tell learners to go out in the night and observe the night sky. They should write down their observations for a discussion the following day.
- Teache learners a poem entitled I see the moon and the moon sees me.
- Describe the moon and its movement round the earth.
- Show learners different shapes of the moon; ¼ , ½, ¾, and full moon and explains that it is the part of the moon that reflects the light is what we see. The moon moves in a cyclic manner. Emphasize the importance of the sun to life on earth and also its importance to other planets by holding them in their orbits.
- Tell learners to learn the names of the planets according to their distance from the sun.
- Inform learners about the visibility of some planets in June 2017 and asks them to find out the planets involved.

Activity B3 3.2.1.1 (a) To observe Venus, the brightest planet.
Discuss with learners when they can observe Venus and what to look out for , for a discussion the next day.

Activity B3 3.2.1.1 (b) Role play the sun and planets.
Leads learners out to an open place. One of the learners should be selected to represent the sun at the centre. Eight other learners representing the planets each in an orbit to move round the sun. The learners should wear tags representing the planets. Teacher explains that the natural satellites are also called moons.

Activity B3 3.2.1.1 (c) Ask learners to discuss folktales or stories told them by their parents about the moon

Summary

- The solar system is made up of the sun at the centre and smaller bodies called planets move round it.
- The sun holds all the planets in their individual orbits round itself in an orderly manner.
- The sun is the only source of energy to the planets.
- It is the sun that keeps the planets warm and also gives light to them.
- On earth, which is the third planet from the sun, the sun's heat enables living things to exist there.
- The moons are smaller heavenly bodies called satellites which move round the planets.

Answers to Study Questions

1. 1. sun, planets, orbits. The moon
2. (i) A – sun B. Earth C. moon
   (ii) sun
   (iii) earth
   (iv) moon
3. Any 2 – Venus, Mercury, Mars, Jupiter, Saturn, Uranus, Neptune
4. 365¼, sun, 28, earth
5. i) Venus, Mercury, Earth, Mars, Jupiter etc (Ang one)
   ii) moon
   iii) sun

STRAND 3: SYSTEMS

SUB-STRAND 3: ECOSYSTEM

LESSON 1: ORGANISMS IN A HABITAT AND WHY THEY LIVE THERE

Content Standard: B3.3.3.1 Show understanding and appreciation of the interactions and interdependencies of organisms in an ecosystem

C**ore Competencies**: Digital Literacy, Cultural Identity and Global Citizenship, Critical Thinking and Problem Solving, Personal Development and Leadership

Expectations: At the end of this lesson you will be able to:

- go on field trip (or a tour of the school environment) to study about some ecosystems.
- identify some observable features that enable organisms to live successfully in their habitat e.g. tilapia has fins to help it swim in a pond.
- plan, design and draw posters showing organisms in their natural homes

Subject Specific Practices: Observing, Classifying, Analysing, Evaluating, Generating

Resources: Pictures or videos of organisms in their various habitats

Reference: Learners Book 3 page 91 - 98

Introduction

Human beings live in homes. Fowls live in coops. The coop is their home. The natural home of a group of living things or a single living thing is called a habitat. Living things living in their habitats do not live in isolation. They interact with each other, with other living things and with the physical environment in which they live. It is possible to identify organisms in a habitat and describe why they live in such habitats. We need to understand why fishes live in water but not on dry land.

Indicators and exemplars: B3.3.3.1.1 Identify organisms in a habitat and describe why they live in a particular place.

Key words: ecosystem, interactions, community, habitat, fish, birds

Additional Information

The world can be divided into a number of different regions, each with its own characteristic plants and animals. The natural home of a group of living things or a single living thing is called Habitat. Small habitats can be found within large habitats. The group of plants and animals found in one habitat is called community. They all interact with each other and their

environment. The community of plants and animals in a given habitat, together with non-living parts of the environment (e.g. air or water) is called Ecosystem.
An ecosystem consists of a group (community) of animals and plants which interact with each other and their environment to produce a self-contained ecological unit. The drawing shows organisms in their various homes (habitats). Every living thing has certain features which enable it to survive in its habitat. Animals which live on land need to have lungs to breathe. The lungs are not needed in water. This is the reason why fish can survive in water but goat cannot.

Starting the lesson

- Show to learners videos of organisms in their various homes – habitats.
- Lead learners in groups of four or five, to tour their school environment to study about some ecosystems, for example, birds and insects on a tree, frogs and fish in a pond, grasshoppers, insects in a grass field, different plants on a farm.

During the tour teacher assists learners to identify some observable features that enable organisms to live successfully in their habitat e.g. tilapia has fins to help it swim in a pond. It also has gills to help it to breathe. Birds have wings to help them fly from a tree.

Guide learners in groups to discuss the following:

1. Is a frog a fish?
2. Why can't a fish live on land?

Tell learners, in their groups, to plan, design and draw posters showing organisms in their natural homes.

Inspect the posters each group of learners has drawn and make comments

Summary

- The natural home of a group of living things or a single living thing is called Habitat.
- A fish has fins to help it swim in a pond and gills to breathe.
- Birds have wings to help them fly from a tree.
- The plants have roots which they use to absorb water and nutrients from the soil

Diagnostic assessment

1. What is the name of the natural home of group of animals and plants?
2. Frogs and fish live in a pond or stream? What is the name of where they live?

Progressive assessment

1. Tilapia lives in its habitat. What is the name of its habitat?
2. Why is tilapia able to live in its habitat?

Answers to diagnostic assessment

1. habitat.
2. Aquatic habitat.

Answers to progressive assessment

1. pond/stream.
2. It has fins to help it swim.

Answers to Study Questions

1. habitat…….
2. community
3. i. water (pond, river, stream, lake)
   ii. on trees which have flowers.
   iii. in the bush.
4. gills, breathe.
5. gills, breathe
6.

Living things	Where living things live	Why they live there
	water	It has gill to breathe. It has fins and can swim
	Land	It has lungs and can breathe
	In the air. On trees	It has wings to fly

7. 

   i. Aquatic(pond)
   ii. fish, snail, bird, insect, frog and plant (any three)
   iii. stone, sand

STRAND 4: FORCES AND ENERGY

SUB-STRAND 1: SOURCES AND FORMS OF ENERGY

LESSON 1: LIGHT IS A FORM OF ENERGY

Content Standard: B3.4.1.1 Know that light is a form of energy

Core Competencies: Personal Development and Leadership, Critical Thinking and Problem Solving, Creativity and Innovation.

Expectations: At the end of this lesson you will be able to:

- talk about light and where light comes from.
- do activities such as closing and opening the windows and doors of your classroom, switching on torch or lighting a candle to look for an object in a dark room, switching on the light in the classroom etc.
- talk about your experiences based on activities you have performed.
- say what will happen if there were no light on the earth.
- say that light is a form of energy that helps us to see.

Subject Specific Practices: Analysing, Observing, Evaluating, Classifying

Resources: Flashlight, candles and books.

Reference: Learners Book 3 page 100 -104

Introduction

Light is a form of energy because it has the ability to do work. This type of energy enables us to see. Our eyes are sensitive to light. Without light everything will be dark and we cannot see. There are natural and artificial sources of light. When a candle is lighted, it produces light. In a dark room a flashlight will enable you to see your way easily.

Indicators and exemplars: Demonstrate the understanding of the concept of energy, its various forms, sources and the ways in which it can be transformed and conserved.

Key words: Light, Window, Door, Torch, Candle, Dark

Additional Information:

Light is a form of energy. The mammalian eye is sensitive to this energy. There is no light at night since the earth turns away from the sun which is the main source of light energy to earth. Similarly, when doors and windows of the classroom are closed the room becomes dark. Switching on the light or opening the windows will bring light into the room.

Starting the lesson
Materials And Resources (Low or no cost): learners, Classroom, Flashlight, Candles, Books.

Procedure:
Begin lesson by performing the activity 4.1.1.1 (a) To demonstrate that light is a form of energy. Lead learners to perform the activity by instructing them. In their groups, they should perform the activity. They should discuss with the whole class.

Activity 4.1.1.1 (b) Class activity
Instruct learners to perform the activity. They should close all doors and windows of the classroom and open their science books to read. Ask them whether they can see clearly. Their responses will lead to further discussion.

Activity 4.1.1.1 (c) Using other sources of light
In groups in the dark room switch on the flashlight and or candle light. Can they see clearly? Ask them to name sources of light.

Summary
- Light is a form of energy which enables us to see.
- Naturally, light is produced by the sun.
- There are natural and artificial sources of light.

Diagnostic assessment
1. What enables us to see?
2. Which part of the body is sensitive to light?

Progressive assessment
1. Can we read our books when windows and windows are closed?
2. Name the major source of light energy

Answers to diagnostic assessment
1. Light energy
2. The eyes

Answers to Progressive assessment
1. No, because there will be no light
2. The Sun

Answers to Study Questions

1. energy, see
2. (a) sun, candle, torch
   (b) candle, torch
   (c) sun
   (d) bucket of water
3. (a)
   - There will be no light.
   - There will be no green plants
   - There will be no heat.

   (b)
   - Absence of light means there will be no food for living things.
   - Absence of heat means the earth will be too cold for life.
4.

Natural Sources	Artificial Sources
sun	candle
firefly	lantern
glow worm	lighted match stick
star	

5. You cannot see
   You cannot walk
   You cannot read

STRAND 4: FORCES AND ENERGY
SUB-STRAND 1: SOURCES AND FORMS OF ENERGY

LESSON 2: HEAT AS A FORM OF ENERGY AND SOURCES OF HEAT ENERGY

Content Standard: B3.4.1.2.1 Know heat as a form of energy and identify some sources of heat

Core Competencies: Personal Development and Leadership, Critical Thinking and Problem Solving.

Expectations: At the end of this lesson you will be able to:

- do activity by rubbing your palms together vigorously for a while and after that touch your cheeks with their palms.
- describe how you feel in your palms when you touch you cheeks after rubbing your palm.
- mention other processes that can generate heat.
- talk about heat as a form of energy.
- mention some sources of heat energy. e.g. the sun, a lighted stove, lighted charcoal.

Subject Specific Practices: Observing, Manipulating, Analysing, Communicating

Resources: Palms of the hand, fire, laptop, mobile phone bulb, lighted stove, lighted charcoal

Reference: Learners Book 3 page 105 - 110

Introduction

Heat is another form of energy. Heat makes things warm and hot depending on how long the body is exposed to it. The sun is the main source of natural heat. How hot a body is, is a measure of the temperature of the body. Heat can also be generated by rubbing palms together as well as when things burn. There are several other ways by which heat can be produced.

Indicators and exemplars: Show understanding of the concept of heat in terms of its importance, effects, sources and transfer from one medium to another.

Key words: Heat, energy, sun, fire, sun lighted stove, lighted charcoal.

Additional Information:
When we visit the hospital sick of malaria, one common thing said is one has temperature. One feels warm and shivery. Our mothers will say one is hot. Pour cold water on him or her. All these show that there is a form of energy known as heat. It makes things hot. In the absence of hot heat things become cold. What is heat then? In this lesson we will learn about heat, its meaning and sources.

Starting the lesson
Materials And Resources (Low or No cost): Palms of the hand, fire, laptop, mobile phone bulb, lighted stove, lighted charcoal

Procedure:
Begin lesson with activity 4.2.1.1.1
Ask learners in the classroom to rub their palms together and use them to touch their cheeks. Solicit answers from them what they feel.
Explain to them why they feel warm. Friction causes some of their stored energy to be converted into heat energy.
Lead learners to brainstorm the meaning of heat.

Ask learners to discuss among themselves and come out with what heat is. Lead them to understand how heat is generated by asking them what things are normally hot.

Sources of heat energy
Ask learners to mention the hot things they have come across before.
Ask learners why the following activities will produce heat

- Lighting a fire
- Changing a laptop
- Charging a mobile phone

Ask learners to mention sources of heat used at home.
Listen to their answers and agree or disagree with them.

Summary

- Heat is a form of energy and flows from a place of higher to lower temperature.
- When palms are rubbed together they generate heat energy.
- Other processes that generate heat include lighting a fire, charging a laptop, charging a mobile phone and lighting a bulb for a long time.
- Sources of heat include sun, lighted stove and lighted charcoal fire.

Diagnostic assessment

1. What does heat do to bodies when it asks in them
2. How does heat move?

Progressive assessment

1. Name two sources of heat energy
2. What energy conversion takes place when one charges a mobile phone?

Answers to diagnostic assessment

1. It makes them hot
2. Yes, it moves from a hotter body to a colder body

Answers to Progressive assessment

1. Sun, fire, lighted bulb etc.
2. 2. Electrical energy to heat energy

Answers to Study Questions

1. (i) heat (ii) warm (iii) friction
2. friction, lighting a fire, charging a mobile phone/laptop
3. (a) (i) heat (ii) sun (iii) sun
4. hotter, colder, higher

STRAND 4: FORCES AND ENERGY
SUB-STRAND 1: SOURCES AND FORMS OF ENERGY

LESSON 3: EVERYDAY USES OF HEAT

Content Standard: B3.4.1.2.2 Know everyday uses of heat

Core Competencies: Personal Development and Leadership, Critical Thinking and Problem Solving.

Expectations: At the end of this lesson you will be able to:

- cite everyday uses of heat energy in the home.
- carry out think-pair-share activity to mention one application of the use of heat energy by the following professions: farmers, nurses, hair dressers, blacksmiths, tailors and seamstresses.
- explain why farmers need heat.
- observe safety measures whilst dealing with hot substances.

Subject Specific Practices: Observing, Manipulating, Analysing, Communicating

Resources: Pressing iron, burning stove, heater, hair dresser.

Reference: Learners Book 3 page 111 - 118

Introduction

Heat is a form of energy. The main source of heat energy on earth is the sun. Without the sun's energy the earth would have been very cold and we cannot stay on it. There are several other sources of heat energy. They include a plugged pressing iron, a charging laptop or mobile phone, charcoal fire and a burning stove. All these sources of heat energy are used for one thing or the other. In this lesson, we are going to study everyday uses of heat energy.

Indicators and exemplars: Show understanding of the concept of heat in terms of its importance, effects, sources and transfer from one medium to another.

Key words: Ironing, food preparation, food preservation, heating of water

Additional information

In our day-to-day activities we use heat for different purposes. We can convert electrical energy into heat energy. That is why when we charge a mobile phone or a laptop they become hot. When we plug iron or a water heater they become hot. Fire for cooking including a stove and charcoal fire are very hot and that is what is used in cooking of food.
We are going to learn about everyday uses of heat.

Starting the lesson
Materials And Resources (Low or no cost): Pressing iron, burning stove, heater, hair dresser.

Procedure:
Begin lesson by asking learners what they use heat for at home. Learners will mention the following uses: Ironing, Food preservation, Food preparation and heating of water among other uses.

Demonstrate how a pressing iron becomes hot when plugged. (Do not allow the learners to perform this experiment)

In some homes charcoal is used in the pressing iron as the source of heating.
Other uses of heat include food preparation and food preservation in frying and boiling of food. The following activities are also performed using heat. Nurses sterilise some equipment by boiling water. Ask learners to be in pairs and each says an activity that is performed using heat. For example heat is used for hair dressing, blacksmiths use it for meting metals, seamstresses and tailors use irons to press their sewing.

Emphasize that hot things can burn the hands so learners should be care ful when touching hot bodies.

Summary
- Heat is a form of energy which makes things hot.
- Heat energy is used in everyday life in the home for ironing clothes, cooking and food preservation.
- Heat energy is also used in many professional duties such as , farming, nursing, sewing, hair dressing and black smithing.

Diagnostic assessment
1. Name one source of heat
2. What does heat do to bodies on which it falls

Progressive assessment
1. How does a tailor use heat energy?
2. Does a farmer use heat energy and for what?

Answers to diagnostic assessment
1. Sun, charcoal fire, plugged mobile phone
2. They become hot

Answers to Progressive assessment
1. He uses heat energy to iron his sewing
2. Yes, and for drying farm produce

Answers to Study Questions

1. True, False
2. Food preparation, heating of water
3.
    - Soften the metal for easy shaping
    - To dry the hair
    - To iron clothes for sewing.
4. (i) drying cocoa beans
   (ii) heat
   (iii) for food

STRAND 4: FORCES AND ENERGY

SUB-STRAND 2: ELECTRICITY AND ELECTRONICS

LESSON 1: DIFFERENT SOURCES OF ELECTRICAL ENERGY

Content Standard: B3.4.2.1.1: Identify different sources of electrical energy

Core Competencies: Digital literacy, Cultural Identity and Global citizenship, Critical Thinking and Problem Solving

Expectations: At the end of this lesson you will be able to:

- investigate to find-out where you get electricity for your home and school.
- tell a story or narrate the history of how electricity was first produced.
- demonstrate how to produce electricity from simple sources such as dry cells (batteries) to light a torch or a lamp.
- discuss with your friends the sources of the electricity your use at home

Subject Specific Practices: Observing, Analysing, Predicting

Resources: Switch, Flashlight, Cells/Battery

Reference: Learners Book 3 page 119 -124

Introduction

There is electricity in almost all homes. In the classrooms and on the streets, there is electricity. Without electricity most activities that we perform cannot be done. We charge our phones and laptops, we iron our clothes, women dress their hair and several other activities are performed with the use of electricity. Where do we obtain electricity from and how does it get to us? In Ghana, electricity is obtained from several sources, in this lesson we will learn about these sources of electricity.

Indicators and exemplars: Demonstrate knowledge of generation of electricity, its transmission and transformation into other forms of energy.

Key Words: Aboadze, Thermal plant, Akosombo, Bui, Hydroelectric plant, electricity, generator, dry cells, torch lamp

Additional Information:

Electricity is generated at a source and carried by electric conductors to where it is used. To generate electricity, one form of energy is converted to electrical energy. The forms of energy that are converted could be thermal where heat is generated and use to boil water and the steam

is used to turn a coil in a magnetic field. Another source is where the potential energy of water raised to a high level is allowed to fall and used to turn the coil in the magnetic field. Generator in the homes which we use fuel to run can also be used. In Ghana these are the main sources of electrical energy.

Starting the lesson
Materials and Resources (Low or no cost): Switch, Flashlight, Cells/Battery

Procedure:
You should have asked learners to find out from their parents and elders the source of electricity they use in their homes.

Ask learners how they obtain electricity at home. Expect answers such as frim Akosombo, Kpong and Bui where there are hydro plants. Aboadze and Asogli plants at Kpone are thermal plants.

Explain to learners how these sources work or show them a video on how hydro plants work.

At Akosombo there is a river which has been dammed and the water raised to a height. The water is allowed to fall. At the height the water has potential energy and as it falls the energy is used to rotate a coil in a magnetic field. This generates electricity.

Lead the discussion on how thermal plants generate electricity or show the learners a video on how a thermal plant works to generate electricity. Explain that gas, diesel or other petroleum products can be used to boil water. The steam produced is used to turn the coil.

Tell the learners of how electricity was first generated. Lead learners to understand that there are other sources of electricity such as cells and batteries. The sun can also be a source of electricity. The sun's energy is converted into electrical energy in solar cells.

Activity 4.2.1.1 To produce electricity from cells(battery)
Ask learners to bring a flashlight per group to school. They should also bring torchlight cells and a light emitting diode.

Instruct them to place the cells in the torch light connected to the light emitting diode. They should switch on and explain how the light they will see came about. Ask learners the energy conversion that took place.

Summary
- electricity is produced by the conversion of any form of energy to electrical energy.
- In a hydro-electric power plant, potential energy of water in a dam raised to a high level is converted to kinetic energy as the water falls and finally is converted into electrical energy as the water turns the turbine below.

- hydro-electric power plants are found in Ghana at Akosombo, Bui and Kpong.
- Another form of energy conversion is burning fuels to produce heat which is used to boil water to produce steam. The steam under pressure will turn the turbines to generate electricity.
- conversion of thermal energy into electrical energy is used at Aboadze to generate electricity.
- gas, diesel or any other petroleum product can be heated in a thermal plant to generate electricity.

Diagnostic assessment

1. Name two sources of hydroelectric power in Ghana
2. What happens to a hydro source if it does not rain for a long time?

Progressive assessment

1. Why is a river dammed to generate electricity?
2. What is a thermal plant?

Answers to diagnostic assessment

1. Akosombo, Kpong, Bui
2. The level of water in the dam goes low and power cannot be generated efficiently again.

Answers to Progressive assessment

1. To raise the water to a high level so that it can fall to turn the coil.
2. It is a plant in which fuel is burnt and the heat generated is used to boil water and steam used to turn the turbine to generate electricity.

Answers to Study Questions

1. (i) converting, energy, electrical
   (ii) solar and chemical
2. (a) Aboadze (b) Bui (c) Kpong
3. (i) Hydro, Thermal
   (ii)

Akosombo		Aboadze	
Kpong	Hydro		Thermal
Bui		Kpone	

4. (i) Chemical, Hydro
   (ii) Solar, Thermal

STRAND 4: FORCES AND ENERGY

SUB-STRAND 3: FORCES AND MOVEMENT

LESSON 1: HOW FORCE CAUSES MOVEMENT

Content Standard: B2.4.3.1.1: Explain force and demonstrate how it causes movement

Core Competencies: Cultural identity and Global Citizenship, Critical Thinking and Problem Solving, Personal Development and Leadership,

Expectations: At the end of this lesson you will be able to:

- define a force.
- describe a force.
- say what forces you observe in everyday life.
- do simple demonstrations on how forces cause movement.

Subject Specific Pratices: Manipulating, Analysing, Observing, Evaluating

Resources: Pen (plastic), tissue paper, magnet, iron pins and nails, toy car, water, bucket and stones.

Reference: Learners Book 3 page 125 - 131

Introduction

We have learnt that a force is a push or pull. When a force acts on matter, different things can happen to the bodies. When a force acts on a body, the body can change its position. It is said to have moved. Other things can also happen to the body. An elastic body when acted upon by a force will change its shape. If the body is moving a force can cause it to move faster or slow it down. It can also stop the body from moving. The direction of motion can also be changed when a force acts on it.

Indicators and exemplars: Know that movement is caused by applied forces due to the release of stored energy.

Key words: Force, push, pull, movement, rubbing magnet, iron nails, rubbing, toy.

Additional Information:

Force is a push or a pull and causes a body to change its position or direction of movement. There are different kinds of forces. They include electrostatic, magnetic, force that will cause movement of water in a bucket when a stone is thrown into it. The electrostatic force will cause pieces of tissue paper to be attracted whilst the magnetic force will cause little pins and nails made of iron to be attracted.

Starting the lesson

Materials and resources (Low or No cost): Pen(plastic), tissue paper, magnet, Iron pins and nails, toy car, water, bucket, stones.

Procedure:

Begin lesson by asking learners what a force is and the effects of forces on a body. For example, when a ball is kicked what happens to it. The learners give their responses.

Activity 4.3.1.1 (a) Rubbing a pen in the hair and using it to pick pieces of paper.

In their groups one member should rub his or her pen vigorously through the hair and send the pen towards the tissue paper and observe what happens. Members of the group should discuss among themselves.

Lead the discussion.

The pen becomes charged by picking up electrons from the hair. The hair becomes positively charged and the pen negatively charged. When the pen is sent towards tissue paper, it repels the electrons in the tissue paper and attracts the positive charges and then picks up the tissue paper. Explain to learners.

Activity 4.3.1.1 (b) Using a magnet to attract iron nails or pins.

Give each group a bar magnet and some office pins or small nails.

Instruct the learners to perform the activity by sending the magnet towards the pins and state their observation after a discussion among themselves. The magnet induces the opposite pole in the pin or nail and attracts it.

Summary

- A force is a push or pull.
- A force causes bodies to move, stop moving, change direction of movement, speeds up movement or slows down movement.
- A force can also change the shape of an elastic object

Diagnostic assessment

1. What is a force?
2. When a body is pulled, what is the direction of movement?

Progressive assessment

1. List two effects of a force on a body.
2. Explain how a magnet will attract a pin.

Answers to diagnostic assessment

1. A force is a push or pull that causes movement
2. It moves towards the one who is pulling

Answers to Progressive assessment

1. starts movement, stops movement, changes shape if elastic, changes direction of movement.
2. When one pole of magnet is sent towards a pin, it induces the opposite pole in the pin and attracts it so it moves.

Activity 4.3.1.1 (c) Throwing stone into water in a bucket

This activity should be performed outside the classroom. Obtain buckets, one for each group. Half fill the bucket with water. Ask learners to stand about 1 metre away round the bucket of water. The learner should pick up some pebbles and throw them continuously into the water. They should discuss their observation. Move from group to group to look at how learners go about the activity.

Listen to each group as they explain what they do. The stone(pebble) falls into the water and makes it to move up. The stone exerted a force on the water and it made it move.

Activity 4.3.1.1 (d) Push a toy car down on the floor

Ask learners to bring toy cars to school the previous day. One toy car per group.
Ask learners to push their toy cars down on the floor and observe what happens. learners observe what happens and discuss among themselves.
The toy car moves along since it was pushed down. Explain that pushing is exertion of a force and causes movement.

Answers to Study Questions

1. (a) ii (b) net
2. (i) attract (ii) moves (iii) move
3. (i) away from (ii) towards

STRAND 4: FORCES AND ENERGY
SUB-STRAND 3: FORCES AND MOVEMENT

LESSON 2: MAINTAINING AND CARING FOR SIMPLE MACHINE

Content Standard: B3.4.3.2.1: Demonstrate how to maintain and care for simple machines.

Core Competencies: Cultural Identity and Global Citizenship, Critical Thinking and Problem solving, Personal Development and Leadership.

Expectations: At the end of this lesson you will be able to:

- see simple machines commonly used in the community.
- identify the simple machines provided and talk about their uses.
- mention how simple machines are maintained and stored in their homes.
- undertake some basic maintenance practices.

Subject Specific Pratices: Observing, Manipulating

Resources: Pair of scissors, Knife, Bottle opener, Tin cutter, hammer, grease or oil, piece of dry cloth.

Reference: Learners Book 3 page 132 - 139

Introduction
The human hand is the part of the body used in manipulation of devices. It is the hand that is used to do all work. However, the extent to which the hand can be used is limited. It cannot be used to remove, for example, tight bolts or to open a tightly closed bottle. For these reasons, humans have made tools that they use to make work easier and faster than hands. These are called simple machines. This lesson discusses simple machines and how they can be used to make work easier and faster.

Indicators and exemplars: Recognise some simple machines used for making work easier, analyse their advantages and know their uses e.g. levers, inclined planes and pulleys.

Key words: Simple machines, pair of scissors, bottle opener, knife, hammer, tin cutter, oiling, greasing.

Additional Information:
Simple machines help humans to work faster and easier. The hands do a lot of work but with simple machines humans can achieve more. There are different types of simple machines and they are specific. They can do a particular job and therefore there are different types. Since they are made mostly of metal, they have to be kept safely and prevented from atmospheric gases as they can easily corrode.

They are mostly made of iron or steel which can rust. They are therefore oiled or greased and placed in a cool dry place.

Materials and Resources (Low or No Cost): Pair of scissors, Knife, Bottle opener, Tin cutter, hammer, grease or oil, piece of dry cloth.
Request learners bring the machines they could get or a picture of them

Procedure:
Assemble the simple machines learners have brought to school on a table. Those they could not bring should be looked at in pictures. Learners use some of the machines in the community. Ask learners to name the machines he has assembled. Listen to the names as the learners mention them. Correct those they do not know.

What activities are the simple machines shown used for? Ask learners to match the simple machines with the activities they are used to do faster and easier.

If there are enough of the simple machines, then put the learners in their groups and see how they use the simple machines for their purpose. If not call the learners one by one to demonstrate how the machines are used.
Help learners to use the simple machines.

Activity 4.3.2.1 To maintain simple machines
Ask learners to bring along some simple machines to school.
Bring machine oil and grease.
Demonstrate to learners how to oil the parts or how to grease the joints.
With a dry piece of cloth, demonstrate how to remove dirt from the machine.
Show how simple machines should be stored in a dry and safe place.

Summary
- Simple machines are used for specific work. They are mostly made of metals such as iron. Iron can easily rust.
- Simple machines used for specific works must be cleaned and dried after the work.
- Some simple machines are oiled and greased and kept away from moisture and dirt.

Diagnostic assessment
1. Look at the diagram below

i. Name the simple machine in the diagram
ii. Why is it called a simple machine?

Progressive assessment

1. Can human hands perform all activities?
2. How do humans perform their activities fast and easily?

Answers to diagnostic assessment

1. A pair of scissors
2. Because they are used to do work easier and faster

Answers to Progressive assessment

1. No, because they are not very efficient
2. By the use of simple machines.

Answers to Study Questions

1. (i) I. Pair of scissors II. Bottle top opener III. Tin cutter IV. Hammer
   (ii) I. cutting materials e.g. cloth
   II. opening tight bottle tops
   III. opening tins
   IV. nailing wood

2. knife
3. (i) learners to draw the diagram

(ii) a. The metal part is oiled to prevent rusting
b. wash and keep it dry after use

STRAND 5: HUMANS AND THE ENVIRONMENT

SUB-STRAND 1: PERSONAL HYGIENE AND SANITATION

LESSON 1: KEEPING THE ENVIRONMENT CLEAN

Content Standard: B3.5.1.1 Recognise the importance of personal hygiene

Core Competencies: Critical Thinking and Problem Solving, Collaboration and Communication, Personal Development and Leadership, Digital Literacy

Expectations: At the end of this lesson you will be able to:

- say what do you do to keep the home and school clean.
- say the different ways of keeping the home and school clean.
- see and handle items that are used to clean the environment.
- compose a song on cleanliness.
- say different ways of keeping the environment clean.
- draw pictures showing ways of keeping the environment clean.
- do an activity to clean selected parts of the school environment.

Subject Specific Practices: Communicating, Generating, Classifying

Resources: Charts on clean and unclean environment, brooms, mops, dusters and detergents, hand gloves and nose masks.

Reference: Learners Book 3 page 141 - 148

Introduction

In the previous lesson, learners were able to demonstrate how to maintain and care for simple machines. The importance of this practice is very relevant to the personal hygiene, not only of the learner, but to everybody. If we are able to maintain and take care of simple machines, then we can also do same our bodies and our environment.

Indicators and exemplars: B3.5.1.1.1 Describe ways of keeping the environment clean

Key words: Environment, cleanliness, brooms, mops, dusters and detergents, hand gloves and nose masks.

Additional Information

The learner is familiar with tools such as brooms, mops, dusters and detergents, hand gloves and nose masks in everyday life. The learner may not know the usefulness of all this especially in relation to the cleanliness of the environment. The things that help us clean our environment

also need to be kept clean just like the simple machines that the learner learnt about how they can be maintained and cared for. It is to our benefit if we keep our environment clean. If we destroy our environment, our environment will finally destroy us. If we keep our environment clean, we can be sure of long and healthy life.

Starting the lesson
Start this lesson by displaying items such as broom and duster on the your desk and ask learners how important they are.

Shows to learners some equipment on page 141 of pupils textbook

Begin this lesson by asking learners what they will do to keep the home and school clean after showing them common cleaning equipment such as brooms, mops, dusters and detergents.
Tell learners, in their groups, to think about the different ways of keeping the home and school clean. Tell learners to present their ideas to the class.
Ask learners, in their groups, to compose a song on cleanliness.

Song
Clean, clean, clean
Keep your body clean
Clean, clean, clean
Keep your classroom clean
Clean, clean, clean
Keep your houses clean
Clean, clean, clean, clean

Sweep, sweep, sweep
Sweep, your classroom clean
Sweep, sweep, sweep
Sweep your homes clean
Sweep, sweep, sweep, sweep

Sweep your gutters clean
Sweep, sweep, sweep, sweep
Tell learner to refer to pictures on page 143 of learner's textbook 3 and hence ask them to state the different ways of keeping their environment clean.






Ask learners to draw pictures that show the ways of keeping the environment clean in their exercise book.

Activity: 5.1.1.1.1 keeping your environment clean

Materials/Resources (Low or no cost): brooms, mops, dusters and detergents, hand gloves and nose masks.

Procedure

- Tell learners to organise themselves in groups of four or five,
- Tell learners to select part of the school compound which is dirty.
- Tell learners to identify the ways by which you can keep the part you select clean.
- Give to learners the necessary equipment they will need to keep the place clean: brooms, mops, dusters and detergents, hand gloves and nose masks.
- Tell learners to use the appropriate equipment to keep the place they have selected clean.

Summary

- Personal hygiene and sanitation play very important role in our lives.
- If we keep ourselves and our environment clean, we can be sure of healthy lives.
- We use brooms, mops, dusters and detergents, hand gloves and nose masks to help us clean the environment.

Diagnostic assessment

1. Name three equipment that can help you clean your environment
2. Which equipment can help you clean oil which has pour on the corridor of your classroom
3. What will you use the following equipment for in cleaning your environment?
   i. cutlass
   ii. hoover
   iii. shovel

Progressive assessment

1. When your school reopened there were cobwebs in your classroom. What equipment will you need to remove them?
2. Which of these activities do you need to do everyday in order to keep your environment clean: mopping the floor of your toilet, clearing the bush in the surroundings, sweeping the classroom, cleaning the water closet or the KVIP

Answers to Diagnostic assessment

1. Broom, mop, shovel
2. Mop
3. (i) to clear the bush in the environment
   (ii) to clean room carpet
   (iii) to clean the gutters

Answers to Progressive assessment

1. Ceiling brush
2. mopping the floor of your toilet, sweeping the classroom, cleaning the water closet or the KVIP

Answers to Study Questions

1. **Personal** and **sanitation** **role** and our environment clean, we can be sure of **healthy** lives.
2. Broom, hand gloves, rake, mop, dustbin
3. Sweeping, clearing bush(weeding)
4. Standing broom, rake, cutlass
5.

		
Dustbin	Broom	Mop
		
Hoe	Disinfectant	Hand gloves
		

Shovel	Rake	Wellington boot

6. To clean
   i. gutter: shovel, hand gloves, Wellington boots, rake
   ii. kitchen: mop, broom
   iii. classroom: broom, mop, disinfectant
   iv. toilet: hand gloves, disinfectant, wellington boots.

STRAND 5: HUMANS AND THE ENVIRONMENT

SUB-STRAND 2 : DISEASES

LESSON 1: COMMON SKIN DISEASES AND HOW THEY CAN BE PREVENTED.

Content Standard: B3.5.2.1 Know common diseases of humans, causes, symptoms, effects and prevention

Core Competencies: Critical Thinking and Problem Solving, Collaboration and Communication, Personal Development and Leadership, Digital literacy

Expectations: At the end of this lesson you will be able to:

- act a play on how you bath
- talk about how regular bathing can prevent skin diseases.
- name some common skin diseases i.e. rashes, eczema, ringworm.
- share your personal experiences or stories on getting skin infections.
- say how common skin diseases can be prevented
- say that it is good to seek medical attention to stop the spread of skin diseases.

Subject Specific Practices: Observation, Communicating, Generating, Classifying, Planning, Analysing, Evaluating

Resources: Charts on skin diseases

Reference: Learners Book 3 page 149 - 155

Introduction

If we do not keep our environment clean, it can affect even our skin. The germs that cause skin diseases are living in our environment. The learner needs to know common diseases of humans, especially those that affect the skin. It is not enough just knowing this but the causes, symptoms, effects and how these diseases can be prevented. Anything that has a cause can be prevented.

Indicators and exemplars: B3. 5.2.1.1 Know how common skin diseases can be prevented.

Key words: prevention, skin diseases, rashes, eczema, ringworm, bathing

Additional Information

Diseases can affect part of the human body. Skin diseases affect only the skin. This is the reason why they are called skin diseases. The germs that cause these diseases are found in our environments. Some common skin diseases include rashes, eczema and ringworm. Once we know these common skin diseases and what causes them we are in a better position to prevent them because prevention is always better than cure.

Ringworm

Ringworm is caused by fungus. It comes as a result of improper cleaning of the body (personal hygiene). People infected by ringworm experience itching and pain in the skin. They have patches on the head and body which is painful and itch them.

Eczema

Eczema is also caused by fungus. The fungus produces tiny spores. The spores of fungus are always in the air. When they fall on the skin which is not clean (favourable condition for their growth) they start growing and spreading. Those infected by eczema experience some colouring on the skin and leave spots on the skin.

Rashes

Rashes are a disease which affects the skin. There different types of rashes. The common type of rashes mostly affecting babies is skin rashes. It is caused by heat. It is there called heat rashes. When the weather is hot and wet and babies sweat, the sweat pore is blocked and the sweat is trapped under the skin of the baby. The rashes appear on the skin like blisters or red lumps. There are other rashes which are not caused by heat by some disease conditions. When the skin makes contact with some substances which makes the skin to itch, it develops rashes. When people take some medicines which is not good for them, they develops rashes on the skin.

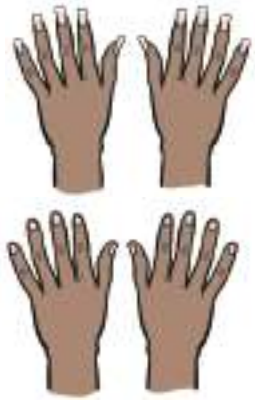
(a)

(b)

What is the girl in (a) and the boy in (b) diagrams above doing? Why should they do what they are doing? Do you do what they are doing in the morning before coming to school? Do you do what they are doing before you go to bed in the evening?
We bath because there is the need to wash away the dirt which sticks to our skin. We use soap, sponge and water to help remove dirt from our skin.

We can prevent common skin diseases in many ways. Some of these ways include:

- Keep your body clean by removing germs
- Avoid wearing the same clothing with people without washing them very well.
- Wash hands with soap and water after shaking hands with people and visiting the toilet.
- Keep finger nails short and clean
- Wash (bath at least two times a day) to remove bacteria, fungus and viruses which may grow on the sweat secretions on the skin
- Keep your clothing clean and change them frequently.



Note: You need to seek medical attention to stop the spread of skin disease. Doctors will prescribe and give you medicine to drink or apply to the skin to cure the skin disease so that it can no longer spread.

Starting the lesson

- Prepare the mind of the learners by asking the following questions:
- Have you ever had some experience about skin infection?
- Have you heard a story about people infected by some common skin disease?
- Tell learners to discuss with their classmates in each group about how they felt when they had the skin infection and about the story they heard about people infected by the common skin disease.
- Proceed to tell learners to act a play on how bathing is done.
- Ask learners how regular they have to bath to prevent common skin disease. Teacher tells learners to discuss it with their classmates.
- Show to learners videos or pictures of common skin diseases. Picture are found on page 151 of pupils textbook 3

Based on the videos or pictures learners have watched, teacher asks them whether they know the name of common skin diseases. Teacher tells learners to discuss with their classmates in each group some common skin diseases that they know and their names. These should include rashes, eczema and ringworm. Teacher tells learners to share their personal experiences or stories on getting skin infections.

Activity: Ways of preventing common skin diseases
Materials/Resources (Low or no cost): no material required

Procedure
- Tell learners to form groups of four or five and appoint a leader.
- Tell the leader in each group to lead a discussion about the different ways of preventing skin diseases.
- Tell learners to record what they discuss in their book and shows it to you (the teacher).
- Re-shape learners' ideas, stressing that it is good to seek medical attention to stop the spread of skin diseases.

Summary
We can prevent common skin diseases in many ways which include
- Keeping your body clean by removing germs
- Avoiding wearing the same clothing with people without washing them very well.
- Washing hands with soap and water after shaking hands with people and visiting the toilet.
- Keeping finger nails short and clean
- Bathing regularly
- Keeping your clothing clean and change them frequently.

Diagnostic assessment
1. Both Cholera and eczema are skin diseases. True or false?
2. Write down three ways of preventing skin diseases

Progressive assessment
1. All the following practices can prevent eczema except
   a. eating three times a day
   b. wearing clean clothes and changing frequently
   c. keeping finger nails short and clean
   d. bathing regularly

Answers to Diagnostic assessment
1. False
2. Keeping the body clean by removing germs

Avoiding wearing the same clothing with people without washing them very well.
Keep your clothing clean and change them frequently.

Answers to Progressive assessment

a. eating three times a day

Answers to Study Questions

1. Fungus. The fungus spores. spores fungus. Skin (favourable condition for their growth) growing.
2. i. fungus
   ii. fungus
   iii. heat or skin infection
3. Eczema
4.
   - Keep their body clean by removing germs
   - Avoid wearing the same jersey with other team members without washing them very well.
   - Wash their hands with soap and water after shaking hands with people.
   - Keep their finger nails short and clean
   - Wash (bath at least two times a day) to remove bacteria, fungus and viruses.

STRAND 5: HUMANS AND THE ENVIRONMENT
SUB-STRAND 2 : DISEASES

LESSON 2: AIR-BORNE DISEASES

Content Standard: B3.5.2.1 Know common diseases of humans, causes, symptoms, effects and prevention

Core Competencies: Critical Thinking and Problem Solving Collaboration and Communication. Personal Development and Leadership Digital Literacy

Expectations: At the end of this lesson you will be able to:

- sing a song, rhyme or poem on air-borne diseases.
- discuss some common air-borne diseases.
- give the meaning of the term 'air-borne disease'
- say the effect of unclean/contaminated air.
- investigate the effects of smoking cigarette on the health of a person and tell your friends about what you have found out .

Subject Specific Practices: Observing, Communicating, Generating, Classifying, Planning, Analysing, Evaluating

Resources: Charts on air-borne diseases

Reference: Learners Book 3 page 156 - 162

Introduction

Among the common diseases that affect humans which have specific causes, symptoms and effects, there are those that are caused by germs that are air-born. These can also be prevented. The learner needs to know examples of these air-born diseases after they have been made to understand what the term means.

Indicators and exemplars: B3.5.2.1.2 Explain the term air-borne diseases and give examples

Key words: air-borne, cold, cough, measles, chicken pox and rashes.

Additional Information

There are different types of diseases depending on what causes them. The germs that cause some diseases can be found in the water we drink, the food we eat and the air we breathe. An air-born disease is one that is caused by germs which are carried in the air. These germs are very tiny and cannot be seen by the naked eye. They are like your enemies which are coming to your house to attack you but you cannot see them until they start attacking you.

They are carried by dust particles or tiny water droplets in the air. Air-borne diseases are also common diseases of humans. We need to know what cause these diseases, what their symptoms are and their effects and how to prevent them.

Meaning of the term 'air-borne disease'

There germs that cause diseases can be carried by a number of things. Some germs can be carried by water. Some can carried in food. Others can be carried in the air. Those that carried in the air are called air-borne diseases. Air-borne diseases are diseases which enter the body through the breathing of air which contains the germ of the disease.

Cold: It is caused by virus which affects the nose and throat. Its symptoms include runny nose, sneezing, stuffy nose, sore throat, generally feeling unwell, congestion.

Cough: It is an uncontrollable (reflex) action that occurs to clear the throat of mucus (phlegm) or any foreign materials that irritates the throat. It is caused by an infection of the respiratory tract which may last for some few days or a week. This infection can be caused by a virus. Tuberculosis which is caused by bacteria can also cause people to cough. If coughing for along time it is advisable to see the doctor.

Measles: Measles is caused by a germ called virus. This virus is also found in the air. When measles virus falls on the skin, it begins to grow and increase in number. Rashes appear on the neck and behind the ears. These rashes later spread all over the body. The rashes usually itch and scratched they burst and spread to other parts of the body. If not detected early and treated, measles can be fatal.

Chicken pox: It is caused by virus. The virus can enter your body when you breathe in air which contains the virus. When a person infected by the disease breathes, the viruses come out in the tiny droplets of water than floats in the air which people close to him or her can breathe in. You can also be infected by the disease when your body touches an infected person. Fever, aching muscle, loss of appetite, generally not feeling of well, rashes, spots which develop in clusters, blisters develop on top of spots

Effect of unclean/contaminated air

Unclean or contaminated air can have the following effects on the health of people:

- irritation of airways into the lungs.
- finding it difficult to breath
- coughing.
- spreading of germs that cause air-borne diseases.
- make the condition of people with asthma worse.

Effects of smoking cigarette on the health of a person




Smoking can have the following effects on the health of people who smoke:

- lung cancer.
- tooth decay
- bad breath
- make the condition of people with asthma worse.
- can affect a child in the womb if a pregnant woman smokes.

Starting the lesson

- Start this lesson by deliberately coughing for a while to draw learners' attention.
- Ask learners what they think may be the cause of his coughing.
- Ask learners if they have coughed before.
- Ask learners whether they know any song, rhyme or poem on air-borne diseases.
- Tell learners one poem if none of them is able say any poem:

I have a little cough,
Cough, cough, cough
Ah, ah, ah, my chest is paining me
I cough, I cough, I cough
I cover my mouth and cough
With my handkerchief, I cough
I cough, I cough and cough
Ah, ah, ah my cough syrup I drink
Okay, okay, okay I am now okay
Now I feel good, now I feel strong
No longer quaho, quaho, quaho, quaho

Activity 5.2.1.2: Naming and discussing some common air-borne diseases
Materials/Resources (Low or no cost): no materials required

Procedure

- Tell learners in groups of four or five to name and discuss some common air-borne diseases such as cold, cough, measles, chicken pox and rashes.
- Refer learners to pictures on page 157 – 159 of learner's textbook 3
- Guide learners to brainstorm to bring out the meaning of the term 'air-borne disease'. Teacher shapes learners opinion about "air-borne diseases" to reflect the true meaning as in page 157 of learner's textbook 3
- Guides learners in a class discussion, to find out the effect of unclean/contaminated air.
- Tells learners to investigate the effects of smoking cigarette on the health of a person and communicate their findings. Refers learners to page 160 of learner textbook 3 to see pictures of the teeth of smokers.

Summary

- Air-borne diseases are diseases which enter the body through the breathing of air which contains the germ of the disease.
- Smoking can cause lung cancer, tooth decay, bad breadth, make the condition of people with asthma worse, can affect a child in the womb if a pregnant woman smokes.
- Some common air-borne diseases include cold, cough, measles, chicken pox and rashes.

Diagnostic assessment
Why do you think smoking is not good?

Progressive assessment
People who live near a landfill site which catches fire frequently complained that their lives are in danger. Explain why you think their lives are in danger from the lesson you have learnt.
Answers to Diagnostic assessment
Smoking is not good because it can cause lung cancer, tooth decay and bad breath. It also makes the condition of people with asthma worse. It can affect a child in the womb if a pregnant woman smokes.

Answers to Progressive assessment
The people who live there can have irritation (itching) of their airways into the lungs. They will find it difficult to breathe. They will be coughing. It will also make the condition of people with asthma worse.

Answers to Study Questions

1. Air-borne diseases are diseases which enter the body through the breathing of air which contains the germ of the disease.
2. measles, chicken pox .
3. diarrhoea, malaria, HIV-AIDS

4. lung cancer, tooth decay
5. Irritation of airways into the lungs, finding it difficult to breath, coughing, makes her condition worse if she has a respiratory disease.

LESSON 1: WAYS FOODS GET SPOILED

Content Standard: B3.5.3.2 Exhibit knowledge of food processing and preservation

Core Competencies: Thinking and Problem Solving, Collaboration and Communication, Personal Development and Leadership, Digital Literacy, Creativity and Innovation

Expectations: At the end of this lesson you will be able to:

- do an activity to show how food gets spoilt.
- discuss ways by which food gets spoilt.
- mention what will happen if you eat spoilt food.

Subject Specific Practices: Observing, Communicating, Generating, Analysing, Evaluating

Resources: pieces of food items such as bread, kenkey and fish

Reference: Learners Book 3 page 163 - 170

Introduction

It is not only humans that germs in the air can attack. These germs can also find their way into the food items that we use everyday. The food items get spoiled by these germs. In order not to let the food spoil, we need to know the ways by which they get spoiled and how they can be processed and preserved.

Indicators and exemplars: B3. 5.3.2.1 Ways foods get spoiled

Key words: Processing, preservation

Additional Information

Food items are obtained from plants and animals. When these plants and animals from which food items are obtained are alive, they remain fresh. When these plants and animals are dead or parts of them are removed as food, they are no more capable of living. They look fresh at the beginning but as they stay a little longer something begins to happen to them. Generally, if food is kept for a long time and it is not stored properly, it spoils. Food which is spoilt looks rotten and smells bad. Some do not smell but it is still spoilt. When this happens you cannot eat such food. If you eat it you will fall sick.

Some of the things that can make food spoiled easily could be physical damage. For example, yam tuber which is whole does not easily spoil but the one which has part of it damaged gets spoiled within a short time.

Some insects also attack food items and they spoil, for example weevils which attack maize, beans and rice. Some food items also spoil if they are wet.
At higher temperatures food items spoil easily

Effect of eating spoilt food
If a person eat spoilt food, he or she is likely to fall sick.

Nausea
The person who eats spoilt food may feel like vomiting (nausea)

Vomiting
The person who eats spoilt food becomes ill and may vomit

Diarrhoea
The person who eats spoilt food may develop diarrhoea (frequent watery stooling)

Stomach pains and cramps
The person who eats spoilt food may have severe stomach pains and cramps

Starting the lesson
Begin this lesson by asking learners

- if they have you seen food which was spoilt before.
- what happens to food before it gets spoilt.

Show video or pictures to learners about ways in which food get spoilt.

Activity:5.3.2.1.1a Ways food gets spoilt
Materials/Resources (Low or no cost): a piece of bread or kenkey or fish.

Procedure

- Gives to each group of learners a piece of bread or kenkey or fish.
- Tell learners to put the piece of bread or kenkey or fish in one corner of the classroom and leave it there for three days.
- Tell learners to put another piece of bread or kenkey or fish in a refrigerator leave it there for three days.
- Tell learners to lets each group inspect the piece of bread, kenkey or fish at the corner of

the classroom and the ones in the refrigerator.

- Ask learners what the appearance of the piece of bread, kenkey or fish is.
- Ask learners what the colour of the piece of bread, kenkey or fish is
- Ask learners to how the piece of bread, kenkey or fish smells.
- Ask learners whether the smell of the piece of bread, kenkey or fish the same as at first.
- Tells learners to discuss their findings with their group members.
- Tell learners to write a report on the activity and present it to you (teacher).
- Tell learners to present their report to the whole class after he or she approves of them.
- Tell learners, in their groups of four or five to discuss ways by which food gets spoilt. Tells leaders of each group of learners to present their work to the whole class.
- Ask learners what they think will happen to them when they eat spoilt food.
- Refers learners to a story on page165 of learner's textbook 3

Story: Once upon a time. There lived a certain boy called Aligbato in a small school in a small village. Aligbato came from school one day and realised his parents had not returned from the farm since morning. Being very hungry, Aligbato ate groundnut soup and banku which was left in the kitchen cupboard the previous day without heating it. After eating the food Aligbato started feeling discomfort in his stomach. Not long after that Aligbato developed diarrhoea and was rushed to the clinic by a neighbour. Aligbato's parents came back from the farm late in the evening to hear what had happened to him. His parents found out that Aligbato had eaten the groundnut soup which was spoilt.

Tell learners in their group to let each person talk about how food is prepared in his or her home.

Ask learners in groups of four or five how they will process the following food items for consumption: yam, plantain, fish, ginger, rice, meat

Tell learners to let each person in the group talk about how food is preserved in his or her home so that it does not spoil.

Activity 5.3.2.1.1b Ways food gets spoilt: using bread
Materials/Resources (Low or no cost): two pieces of bread.

Procedure

- Gives to each group of learners two pieces of bread.
- Tell learners to make the piece of bread moist by sprinkling water on it.
- Tell learners to keep it in a warm place in a corner of the classroom.
- Tell learners to put another dry piece of bread in another corner.
- Tell learners to leave the pieces of bread in the corners for 3 to 4 days
- Ask learners whether the pieces of bread look the same in appearance.
- Tell learners to describe the appearance of each piece of bread.
- Tell learners to discuss their observation with members of their group.

Activity 5.3.2.1.1c: Ways food gets spoilt: using mango
Materials/Resources (Low or no cost): ripe mangoes

Procedure

- Gives two ripe mangoes to each group of learners in the class

Tell learners to:

- put one ripe mango in a fridge
- put another ripe mango in one corner of the room.
- leave the two mangoes for 3 to 4 day.
- observe the two mangoes critically.

Ask learners whether the mangoes look the same in appearance.

- Tell learners to describe the appearance of each mango
- Tell learners to discuss their observation with members of their group.

Activity5.3.2.1.1c: Ways food gets spoilt : using groundnut soup
Materials/Resources (Low or no cost): two beakers and groundnut soup for each group of learners

Procedure

- Give learners in groups two beakers and groundnut soup.
- Tell learners to pour half of the groundnut soup in one beaker.
- Tell learners to pour the other half of the groundnut soup in the second beaker.
- Tell learners to cover each beaker and leave each in one corner of the classroom.
- Tell learners to heat some of the groundnut soup each day and leave the other one without heating it for 3 to 4 days.
- Tell learners to observe each soup and discuss what they observed with class classmate
- Asks learners which of the soup they could describe as spoilt.

Activity5.3.2.1.1d Ways food gets spoilt: using fresh fish
Materials/Resources (Low or no cost): fresh fish

Procedure
Tell learners to:

- put one fresh fish in the sun at a safe place.
- put a second fresh fish in one corner of the room.
- leave the two fishes for 3 to four days.
- observe the two fishes critically.

Ask learners if the fishes look the same in appearance.

- Tell learners to describe the appearance of each fish.
- Tell learners to discuss their observation with members of their group.

Summary

- If food is kept for a long time and it is not stored properly, it spoils.
- Food which is spoilt looks rotten and smells bad. Some do not smell but it is still spoilt.

Diagnostic assessment

1. If you ate groundnut soup which is spoiled, state three things that are likely to happen to you
2. A fish in Ghana called "Kobi" does not easily get spoilt but fresh fish does. Why?

Progressive assessment

1. When there is light off in your home for three days
   i. state what will happen to the fresh fish your mother bought from the market and why?
   ii. what should your mother do to the fresh fish?

Answers to Diagnostic assessment

2. You are likely to have Stomach pains and cramps, nausea, vomit and diarrhoea
3. The "Kobi" is preserved by adding salt to it and drying. The fresh fish is not preserved

Answers to Progressive assessment

1. (i) It will spoil and get rotten because it can no longer be preserved
   (ii) She should smoke it, fry it or add salt to it and dry it

Answers to Study Questions

1. (i) A
   (ii) It was left for a long time without preserving it
   (iii) Nausea, diarrhoea, vomiting
2. i) You will fall sick
   ii) It was left for a long time without preserving it
   iii) No
   iv) It should be buried in the soil
   v) It should be preserved (by refrigeration)
   vi) Nothing will happen to you
3. The food item are spoilt or the food item have gone bad or the food item is mouldy
4. (a) Nausea
   (b) Diarrhoea

STRAND 5: HUMANS AND THE ENVIRONMENT

SUB-STRAND 4: CLIMATE CHANGE

LESSON 1: HUMAN ACTIVITIES THAT POLLUTE THE ATMOSPHERE

Content Standard: B2.5.4.1.1 Human activities that pollute the atmosphere

Core Competencies: Critical Thinking and Problem Solving, Collaboration and Communication, Personal Development and Leadership, Digital Literacy

Expectations: At the end of this lesson you will be able to:

- explain that "atmosphere" refers to the air around us.
- tell stories or talk about scenarios that pollute the atmosphere i.e. burning of waste and bush, exhaust fumes from moving cars etc.
- play a simple game or do activity on how the atmosphere gets polluted by human activities., e.g. smoke from mosquito coils, burning of pieces of paper.
- mention human activities that pollute the atmosphere.

Subject Specific Practices: Observing, Predicting, Analysing, Planning, Evaluating.

Reference: Learners Book 3 page 171 - 175

Introduction

The atmosphere is the area around the earth. It contains a mixture of gases called air. It is this air that all humans and other living things breathe. Oxygen is the component of air that living things use for respiration. There are other gases which combine to make air. Nitrogen is the major component of air. It also has carbon dioxide and rare gases. All these are in fixed proportions. If other gases are introduced into the atmosphere, they become pollutants and have dangerous effects on living things. Even an increase of carbon dioxide in the atmosphere affects living things. Humans burn material, cut down forests and introduce other poisonous materials into the atmosphere. This causes pollution of the atmosphere.

Indicators and exemplars: B3.5.4.1.1: Identify human activities that pollute the environment

Key words: Pollution, Atmosphere, Air, Burning waste, Climate

Additional Information

Plants use carbon dioxide to make their food. It is this food that animals live on. Carbon dioxide in the atmosphere has a fixed volume of about 0.03% of air. Human activities of cutting down forests, burning bush cause a decrease in plant population.

At the same time, humans burn fuel, pieces of paper and other carbon containing materials which introduce both carbon dioxide and carbon monoxide into the atmosphere. Carbon dioxide above a certain concentration become poisonous. Carbon monoxide can cause diseases. Other gases are also produced when we burn material. All these are causing atmospheric pollution.

Starting the lesson
Materials and Resources (Low or No cost): Charts and videos of activities such as bush burning, burning of refuse at site, car exhaust.

Procedure:
Begin lesson by showing learners either a chart or video on bush burning and another on deforestation. Ask learners what the fires produce and where does it go.
Explain what the atmosphere is and discusses briefly the gases in the atmosphere.
Lead learners to appreciate the effect of the increase of these gases in the atmosphere.

Activity 5.4.1.1(a) Story telling about scenes learners have seen about atmospheric pollution.
In groups, discuss what you have experienced on acts that can pollute the atmosphere. Share your experiences with other members of the class.

Activity 5.4.1.1(a) Burning materials
This activity should be performed outside the classroom. Learners should bring a box of match, mosquito coil and some paper to the classroom. In their groups, they should burn the materials. They should observe where the smoke goes. They should discuss among themselves.

Summary
- Exhaust fumes from moving vehicles result in air pollution.
- In pollution the atmosphere which is made up of different gases become contaminated with the smoke from burning materials.
- Vehicles that move on rough roads throw a lot of duct into the atmosphere. Dust pollution is similar to smoke pollution.

Diagnostic assessment
1. What is the atmosphere?
2. Name the gas used by humans for respiration.

Progressive assessment
1. What is smoke?
2. Where does smoke move to?

Answers to diagnostic assessment

1. The atmosphere is the area around the earth
2. Oxygen

Answers to Progressive assessment

1. Smoke is produced when materials burn
2. Smoke moves into the atmosphere

Answers to Study Questions

1. (i) bush, rubbish, pollution
   (ii) smoke
   (iii) smoke, pollution
2. It causes atmospheric pollution.
3. (i) smoke (ii) dust (iii) fumes
4. Tell her smoke from the coil will cause pollution and can lead to breathing difficulties whilst you are sleeping, so she should not do it again.

APPENDIX

ANSWERS TO WORKBOOK

STRAND 1 : DIVERSITY OF MATTER
SUB-STRAND 1: LIVING AND NON-LIVING THINGS

LESSON 1: CLASSIFY LIVING THINGS BASED ON THEIR LIFE PROCESSES

B3.1.1.1.1 Classify living things into plants and animals by their life processes

1. i) Plants: yam, carrot, coconut, lettuce, cucumber, tomato
   ii) Animals: camel, horse, parrot, mouse, mosquito, housefly, guinea fowl.
2. i) Feeding
   ii) Respiration(Breathing)
   iii) Excretion
3. i) Goat ii) sheep iii) cat iv) mosquito v) fish (any 3 correct animals)
4. Mango tree, pawpaw tree, coconut tree(any other correct plants)
5. (a) Four(four)
   (b) Five(5)
   (c) (ii) = Pepper, (v)= Tomato, (vii)= okro,
   (ix) = cocoyam
   (d) (i)=scorpion, (ii) Cat, (iii) Termite, (iv) Tsetsefly , (v) = frog
   (e) Feeding, breathing(respiration), reproduction(produce babies)
6. (a) Six(6)
   (b) Four(4)
   (c) Monkey, ant, man, goat
   (d) Cocoa, mango, tomato, okro , rice, carrot

SUB-STRAND 2: MATERIALS

LESSON 1:`EVERYDAY MATERIALS, THEIR USES AND PROPERTIES

B3.1.2.1.1 Identify the uses of everyday materials and link the uses to their properties

1. (a)

Products	Properties of materials
	It can be moulded into different shapes and is light in weight
	It is hard
	It is transparent(you can see through it)
	Heat can pass through it easily
	It is soft when wet and can be easily moulded

   (b) A and E..
   (c) B
   (d) D
   (b) C
2. objects, propertise, transparent, metal
3. i) plastic ii) wood iii) textile iv) metal v) clay
4. i) hard
   ii) smooth
   iii) bendable
   iv) can be moulded when hot and soft
   v) hard

LESSON 2: MATERIALS USED FOR MAKING COMMON OBJECT

B3. 1.2.1.2 Demonstrate understanding that an object is made of one or more materials.

1.

Products	Materials used to make the products
Table	Metal, glass, rubber
Car	Wood, nail
Mobile phone	Wood, graphite
Pencil	Glass, plastic, metal

2. (a) A = Umbrella
   B = Hut
   (b) Metal, textile or rubber
   (c) clay, hatch, wood
3. i) wood, metal
   ii) wood is hard
   metal is hard

LESSON 3: HOW TO FORM AND SEPARATE SOLIDS AND LIQUID MIXTURES

B3. 1.2.2.1 Describe solid-liquid mixture and explain how to separate the components

1. Solid, liquid, sugar, sand, filtration
2. i) The sugar will dissolve in the water.
   ii) a mixture
   iii) Heating to evaporate the water to leave the sugar behind
3.

Table A	
Solid	Liquid
Sand	Water
Salt	Kerosene
Sugar	Vinegar
Iron filing	Oil

Table B	
Mixture	Method of separation
Sand and water	Filtration
Sugar and water	Heating to evaporate the water, leaving the sugar behind
Iron filing and water	Filtration
Salt and oil	Filtration

4. i) Heating to evaporate the water, leaving behind the saltpetre
   ii) Filtration to get the iron filings
   iii) Pour the water out (decantation)
   iv) Heating to evaporate the water leaving the salt behind.

LESSON 4: HOW SUBSTANCES CHANGE STATE BETWEEN SOLID, LIQUID AND GAS

B3. 1.2.3.1 Explain how substances change state between solid, liquid and gas

1. (a) i) liquid to solid
   ii) solid to liquid
   iii) solid to liquid
   iv) liquid to gas
   v) gas to liquid
   (b) It melts and become liquid
   (c) What has caused the change in the hausa koko when
   (i)It has lost heat
   (ii) It has gained heat
2. i) rice, banku, pepper, chair, table, ice block(any 2 and any other correct solid in the home)
   ii) water, vinegar, soup, porridge, perfume(any 2 or any other correct two liquids)
3. i) melting
   ii) freezing
   iii) condensation
   iv) boiling
   v) boiling
   vi) condensation
4.

Material	Sate
Kenkey	Solid
Ice block	Solid
Kerosene	Liquid
Vinegar	Liquid
Air	Gas
Wind	Gas

5. (a) A = ice.
   B = liquid water
   C = water vapour
   (b). (i) = melting
   (ii) = evaporation
   (iii) = condensation
   (iv) = freezing
6. (a) Ethanol, ice , oil, water, gun powder, rubber, salt
   (b) Heating, boiling, melting, freezing, condensation, evaporation

STRAND 2 : CYCLES
SUB – STRAND 1 : EARTH SCIENCE

LESSON 1: SOME CYCLIC EVENTS THEIR INTERVALS/PERIODS

B.3.2.1.1 Describe some cyclic events like day and night, wet and dry seasons and their intervals/periods.

1. (a) cyclic
   (b) day
   (c) wet and dry
   (d) rain
2. A. False
   B. True
   C. False
   D. False
   E. True
3. (a) Wet season
   (b) Dry season
      i) It rains
        The weather is cold
        There is aboundant food
      ii) The weather is dusty
        The weather is windy
        The sun is very hot

LESSON 2: IMPORTANCE OF THE SUN TO THE EARTH

B3 2.1.2.1 Importance of the sun to the Earth.

1. i) light and heat
   ii) day
   iii) sunlight
   iv) light
2. i) Provides us with light and heat
   ii) Enable plants make their food using sunlight
   iii) Animals feed in plant food
3. Accept any correct diagram
4. i) light ii) Heat iii) Heat iv) Light v) Light

LESSON 3: TYPES OF PRECIPITATION

B3.2.1.3.1 Identify the types of precipitation (rain, snow, hail, sleet) and describe the differences among them

1. i) Snow
   ii) Sleet
   iii) Hail
   iv) Rain
2.

	Description of precipitation	**Name**
1	This occurs when precipitation falls from the clouds as liquid water.	Sleet
2	This occurs when precipitation falls from the clouds as cold, flaky solids.	Hail
3	This is precipitation that falls from the clouds to the surface as balls of ice.	Snow
4	This is a mixture of snow and rain	Rain

   Accept any correct diagram of rainfal and snow storm
3. i) snow
   ii) Hail
   iii) Sleet
4. Clouds, rain, liquid, snow, ice

LESSON 4: THINGS THAT MAKE WATER IMPURE

B3.2.1.4.1 Identify things that make water impure

1.

 Leaking petroleum pipe	 Pipes carrying waste emptying into water bodies
 Minning chemicals are washed into water bodies	 Rubbish being thrown into the river

(b) They make water impure.
(c) It makes the water dirty and cannot be used.
(d) Animal faeces make water dirty and harmful
(e) i) seal all leaking pipes
ii) Do not empty pipes carrying waste into rivers and water bodies
iii) Do not wash animals into water bodies

2.

- Improper disposal of animal wastes
- Dumping of waste substances into gutter which cause flooding and the floods carry the waste substances into water bodies
- Dumping of Industrial waste into water bodies by some industries
- Farmers apply fertilizers and pesticides to their crops which are washed into surrounding water bodies during rainfall.
- Household chemical such as shampoos, liquid soap, mosquito spray and many others flow into gutters and finally end up in water bodies. (Any 4)

(b) flooding
(c)

- Improper disposal of animal wastes

- Dumping of waste substances into gutter which cause flooding and the floods carry the waste substances into water bodies
- Dumping of Industrial waste into water bodies by some industries
- Farmers apply fertilizers and pesticides to their crops which are washed into surrounding water bodies during rainfall.
- Household chemical such as shampoos, liquid soap, mosquito spray and many others flow into gutters and finally end up in water bodies.
- (Any 2)
- (d) If Kofi's father also dispose of the waste of the cattle in an improper manner and it gets into water bodies they become impure.

3. (a) application of fertilizer.
   (b) When it rains, the rain washes the fertilizer into water bodies to pollute them
4. In order to get the fine metal out from the sand, chemicals are added which are washed into rivers and other water bodies.
5. (a) False [√]
   (b) False [√]
   (c) True [√]

LESSON 5: PROPERTIES OF AIR

B3. 2.1.4.1 Describe the properties of air

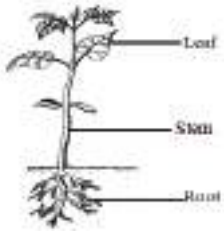
1. (a) pull or push
   (b) i) has a taste
   ii) has good smell
   iii) has a nice colour
2. (a) Air helps things to burn
   (b) Air has weight/mass
   (c)Air pulls or pushes things (Air exerts pressure)
3. i) air occupies space
   ii) (b) air can push objects
   iii) (c) air supports burning
   iv) air has mass

   To demonstrate that air helps things to burn (Air supports combustion)

LESSON 6: GERMINATION OF MAIZE AND BEAN SEEDS IN WATER

B3.2.2.1.2 Observe the germination of maize and bean seeds in water

1. Germination is the coming out of the embryo (new developing plant) from a seed when some conditions are met.
2. (i)Air, temperature, water(moisture), viability of the seed (any 3).
3. It must germinate and continue to grow when it continues to get air, water, light, and nutrients from the soil.
4. (a) False [√]
   (b) False [√]
   (c) True [√]
   (d) False [√]
5. (a) Germination
   (b) Root, stem and leaves
   (c) Air, water, adequate temperature
   (d)



STRAND 3: SYSTEMS
SUB-STRAND 1: THE HUMAN BODY SYSTEM

LESSON 1: EXTERNAL PARTS OF THE HUMAN BODY AND HOW THEY WORK TOGETHER

B3.3.1.1.1 Explain that the external parts of the human body work interdependently to perform a function.

1. nose, eyes, mouth
2. (i). legs and hands
   ii) legs and hands
   iii) legs
   iv) Arms
   v) legs and arms
3. i) To see ii) Walk iii) To carry your books
4. (i) the hand, the ear and the eyes
   (ii) Hand= to throw football, Eyes= to see the football, ear= to hear the referee when he or she blows the whistle and to hear the team members when they call

SUB – STRAND 2 : SOLAR SYSTEM

LESSION 1: THE SUN, EARTH AND MOON AS PARTS OF THE SOLAR SYSTEM

B3.3.2.1.1 Know the sun, earth and moon as part of the solar system

1. i) sun ii) earth iii) moon iv) sun v) moon
2. i) (c) sun
   ii) (a) moon
   iii) 28 days
   iv) (b) 365 days
   v) (a) sun
3. Accept any correct diagram

SUB-STRAND 3: ECOSYSTEM

LESSON 1: ORGANISMS IN A HABITAT AND WHY THEY LIVE THERE

B3.3.3.1.1 Identify organisms in a habitat and describe why they live in a particular place.

1. i) The natural home of living things.
   ii) Yes.
   iii) This because cockroaches and mice can live there if it is not always kept clean
2. Where do the following organisms live?
   (a) Water.
   (b) land
   (c) land
   (d) Land
   (e) Land
3. i) it has gills thta enables it breathe
   ii) On trees because it has wings to fly
   iii) Rat on land because it has lungs to breathe
   iv) Monkey on land because it has lungs to breathe
   v) Frog water and land because the tape pole has gills and the mature one has lungs
4. i) Human beings do not have lungs to breathe in water but fish has lungs to breathe in water.
   ii) Bats have their fore limb in the form of wings and can therefore fly.
5. i) Fish, frog, water snail, some insects, some plants (any 2 and any other two correct living things)
   ii) frog iii) Rat iv) fish v) fowl

STRAND 4 : FORCES AND ENERGY
SUB – STRAND 1: SOURCES AND FORMS OF ENERGY

LESSON 1: LIGHT IS A FORM OF ENERGY

B3.4.1.1.1 Know that light is a form of energy

1. energy, see, sun, day, artificial
2. (a) i) sun ii) firefly, glowworm (any 2)
   (b) i) candle light
   ii) flashlight etc.
3. i) You cannot read your books
   ii) You cannot walk easily
   iii) You cannot write
4. i) Light enable me to read
   ii) Light enable me to walk easily
   iii) Light enable me to write

LESSON 2: HEAT AS A FORM OF ENERGY AND SOURCES OF HEAT ENERGY

B3 . 4.1.2.1 Know heat as a form of energy and identify some sources of heat

1. i) A lighted stove
   ii) sun
   iii) Lighted charcoal
2. hot, cold, sun, lighting a fire, charging a laptop, switching on a bulb for a long time.
3. Accept any correct diagram

LESSON 3: EVERYDAY USES OF HEAT

B3 4.1.2.2 Know every day uses of heat.

1. i) Drying of clothes
   v) cooking of food
   vi) Melting of ice
2. i) Hair dressers
   ii) Blacksmith
   iii) Tailor or seamstress
3. i) Fish
   ii) Bread
   iii) Meat pie

SUB -STRAND 2: ELECTRICITY AND ELECTRONICS

LESSON 1: DIFFERENT SOURCES OF ELECTRICAL ENERGY

B3 4.2.1.1. Identify different sources of electrical energy

1. i) Hydro
   ii) Thermal
   iii) Soar
2. i) Lemon
   ii) Zinc + copper strips
   iii) copper wire
   iv) light emitting diode
3. i) Akosombo
   ii) Bui
   iii) Kpong

SUB – STRAND 3 : FORCES AND MOVEMENT

LESSON 1: HOW FORCE CAUSES MOVEMENT

B3. 4.3..1.1 Explain force and demonstrate how it causes movement

1. push, pull, work, stop, shape
2. i) stationary object to start moving
   ii) moving object to stop moving
   iii) moving object to change its direction
3. i) Kick a ball
   ii) Throw a stone
   iii) Stop a moving ball

LESSON 2: MAINTAINING AND CARING FOR SIMPLE MACHINES

B3.4.3.2.1 Demonstrate how to maintain and care for simple machines

1. faster, easier, hand, damaged
2. cutlass, hoe, knife, Rake, pick axe
3. i) Bad ii) Good iii) Good iv) Good v) Bad
4. i) (a) Greasing
      (b) oiling
   ii) knife

iii) Tin cutter
iv) Because water with air are materials that cause iron to rust and most simple machine are made of iron.

STRAND 5: HUMANS AND THE ENVIRONMENT
SUB-STRAND 1: PERSONAL HYGIENE AND SANITATION

LESSON 1: KEEPING THE ENVIRONMENT CLEAN

B3.5.1.1.1 Describe ways of keeping the environment clean

1. i) Sweeping ii) mopping iii) cleaning, hovering (any 3)
2. i) sweeping the classroom
   ii) weeding the enviroment
   iii) Mopping the ground
3. i) broom
   ii) mop
   iii) rake etc.
4. i) To sweep
   ii) To weed
   iii) Put refuse in it
   iv) Collect together materials
   v) To mop the we floor
5. (a) Rake
   Hand glove
   Broom
   Dust bin
   Wellington boot
   (b) Toilet, classrom, gutter
   (c) sweep, clean
   (d) Good health

SUB-STRAND 2 : DISEASES

LESSON 1: COMMON SKIN DISEASES AND HOW THEY CAN BE PREVENTED.

B3. 5.2.1.1 Know how common skin diseases can be prevented

1. (i) chickenpox.
   (ii) ringworm
   (iii) heat rashes

2. (iii) bathing regularly [√]
3. (i) virus
   (ii) fungus
   (ii) fungus
4. Ringworm
5.
   Keep your body clean by removing germs
   Avoid wearing the same clothing with people without washing them very well.
   Keep your clothing clean and change them frequently.
   Keep finger nails short and clean
   (Any 2)

LESSON 2: AIR-BORNE DISEASES

B3.5.2.1.2 Explain the term air-borne diseases and give examples

1. An air-borne disease is a disease which enters the body through the breathing of air which contains the germ of the disease.
2. Measles and chickenpox
3. Measles
4. (a) smoking
   (b)
   - lung cancer.
   - tooth decay
   - bad breadth
   - makes the condition of people with asthma worse.
   - can affect a child in the womb if a pregnant woman smokes.
5. (a) Burning of vehicle tyres.
   (b)
   - Irritation of airways into the lungs.
   - Finding it difficult to breath
   - Coughing.
   - Spreading of germs that cause air-borne diseases.
   - Makes the condition of people with asthma worse.

SUB-STRAND 3: SCIENCE AND INDUSTRY

LESSON 1: WAYS FOODS GET SPOILED

B3. 5.3.2.1 Ways foods get spoiled

1. (b)Exposing food flies [√]
   (d) Keeping the food always in water [√]
2. (b) Cooking the food [√]
   (d) Frying the food [√]
3. (i) Diarrhoea
   (ii) Stomach pains and cramps
4. (a) It will spoil and be smelly
   (b) It will not spoil if it was fried well
5. i) She can smoke it
   ii) She can fry it
   iii) She can cook it
6. i) Putting it in a refrigerator
   ii) drying it
   iii) drying it
   iv) frying or putting it in a refrigerator

SUB – STRAND 4 : CLIMATE CHANGE

LESSON 1: HUMAN ACTIVITIES THAT POLLUTE THE ATMOSPHERE

B3. 5.4.1.1. Human activities that pollute the atmosphere

1. i) earth
   ii) mixture
   iii) dust
   iv) asthma
   v) burning
2. i) respiratory tract disease
   ii) Inability to breathe in
3. i) Smoke from burning of bush
   ii) dust on untarred road
   iii) smoke from vehicles
   iv) rotting vegetation, which has been cut down.