Teacher's Guide

Part C:
Teaching Basic Science and Technology (P 4-6)

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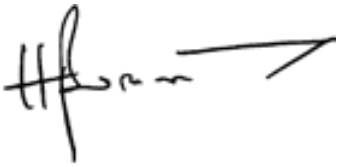
Foreword

One of the biggest challenges Nigeria faces is how to ensure that the tuition provided in schools is of good quality such that pupils' learning outcomes improves significantly and those who complete primary school possess the requisite competences prescribed in the national curriculum. The current situation in which pupils' mean score in English, Mathematics, and Life Skills is only 30%-40% is a matter of concern to UBEC and all stakeholders.

To improve mean scores in the core subjects requires significant changes in the way teachers plan and deliver their lessons. It means building the capacity of teachers to make the transition from teacher centred methods to activity-based learner centred approaches. Teacher's Guide on Pedagogy, Literacy, Numeracy and Science & Technolgy has been developed by the Teacher Development Programme (TDP) seek to facilitate the adoption and use of active learning approaches in our classrooms.

UBEC is delighted to collaborate with TDP to make the Teacher's Guide available to schools in all parts of the country. Our expectation is that teachers will adapt and contextualise the Teacher's Guide to their local situation and use them to enhance the quality of teaching and learning in the classrooms. As soon as the Teacher's Guides are distributed to schools, teachers will be trained to use them as part of the UBEC-funded Teacher Professional Development programme.

I must thank DFID/UKAid and TDP for collaborating with us to improve the quality of teaching and learning in primary schools.



Dr Hamidu Bobboyi

Executive Secretary,

Universal Basic Education Commission,

Abuja.

6th March 2017

Contents

Acronym Table

Acronym	Full Title
AV	Audio-Visual
CM	Cluster Meeting
DFID	Department for International Development
ESSPIN	Education Sector Support Programme in Nigeria
HT	Head Teacher
LPL	Lesson Plan Light
TDP	Teacher Development Programme
TDT/SSIT	Teacher Development Team/State School Improvement Team
TF/SSOs	Teacher Facilitators/School Support Officers
TG	Teacher's Guide

Welcome and Introduction

Welcome to Teacher's Guide Part C.

There are five modules in this guide: Science Process Skills, Basic Science, Basic Technology, Information Technology and Health Education. It should be used with Teacher's Guide A – General Pedagogy. Both guides will improve the way that you teach science.

Have a look at the information about lesson plans in Annex 1. Also read the pages about using everyday materials to teach science and technology. This will give you plenty of ideas!

Like the other Teacher's Guides (Parts A and B), these modules include activities and exercises for teachers, audio-visual clips, questions to reflect upon and suggestions for classroom activities. The activities are simple and basic and can also be used with pupils in the class. We strongly encourage you to study this material together with your partner in school and to try out the different activities when you teach. You can reflect after class on your challenges and successes.

Difficult words and their meanings have been translated into Hausa for easier understanding (Annex 2 - 'Scientific terms'). In addition, the answers to each section's questions are in Annex 3. Do not hesitate to ask your LGA Trainer or Teacher Facilitator (TF) questions about the module contents during school support visits or cluster training.

Enjoy your own learning!

Module 7:
Science Process Skills

Module 7:
Science Process Skills

Science is about doing activities in a fair and accurate way to find out what happens. Primary children enjoy learning by being active and trying things out. In this way they will also develop and practice science process skills. You have these skills too. They include; observing, communicating, classifying, measuring, inferring (concluding) and predicting. Science is a core subject in our schools because these skills are important for our pupils. It is also most interesting because it enables pupils to find out about how the world works.

Science knowledge and skills are used in technology to discover and invent new things which can make our lives even better.

In this module we will be thinking about how to teach these science process skills.

Objectives

By the end of this module, you will be able to:

- Understand and apply the six science process skills.
- Create activities that teach specific science process skills.

Scientific terms used in this module

- Observing
- Communicating
- Classifying
- Measuring
- Inferring (concluding)
- Predicting

Section 1:
Observing

Have you paid close attention to the way it rains? Drops fall into pools of rainwater in a specific way. They run down glass, but not in a straight line, and join with other drops to form winding trickles. Paying close attention like this is known as ***observing***. Observation raises questions in our minds about why things happen, and also helps us to work out an answer.

Observing is an important science process skill to develop. Our pupils can use this skill effectively to learn about the world around them. Observing is a deliberate act to gather important information. For example? What kind of trees are in the village/town? What birds are near the school? These questions can be answered by looking at the clouds to find out their shape and size and colour, and listening to and inspecting the birds.

Observing uses our senses of sight, smell, taste, touch, and hearing to pay close attention to something in other to gather information about it. We will discover new information. For example, by paying close attention to the height and weight of Jamila, we can discover that she is a healthy size for her age. Similarly, by observing Musa's coloured drawings, we may discover that he has a good understanding of shape but is mixing his red and green colours up. Observing is very important in Science.

Think

1) Think about the last time you paid close attention to something outdoors?
2. Why did you have to observe this?
3. What did you find out from your observation?

Look at the photographs below and write down what you observe about each one. You may use the following questions to guide your observations..

1. What is happening in the picture?
2. How many people are involved?
3. Are they active or passive? Are they enjoying themselves or not?
4. In what kind of environment is the picture taken?

Reflect

1) Think about 5 objects you can observe (see or hear) in the classroom or out of the window of the classroom. Write a suggestion for each one. (*E.g. This object is tall, brown at bottom and green at the top = the tree outside*). You can test these clues with your class.

2) What would you observe to be able to judge your pupils' understanding of a topic you have taught them? Why?
   - pupils talking in a group
   - pupils copying from the board
   - pupils answering questions
   - pupils watching a teacher's demonstration

Work with your partner in school

Observe each other in a science lesson, write down your observations and give constructive feedback to each other on

1. What two things were good about the teaching method?
2. How involved were pupils in the lesson?
3. What one thing would improve the teaching method?

Section 2:
Communicating

When you think of communicating what comes to mind? We can say it is a way of getting information across to another person, or a means of sharing our experiences. You already know many ways of communicating. We communicate by talking on the phone, writing e-mails, chatting face-to-face etc. In science, communicating is used to pass on what we've done and what we've learned to other people. This can be done by discussing, writing and drawing. Ideas and discoveries should be shared and that is why communication is an important science process skill.

As a good science teacher, you will need to develop these different communication skills so that you can get learning across to your pupils effectively..

Think

1. In which ways do you communicate in your science classroom?
2. Have you taught communication before? What teaching activities were most effective with pupils?
3. How did you organize your class?

The scenario below and decide how you would ask the pupils to communicate the method and results of their activity (remember that communication may be verbal, written or through a poster of diagrams and drawings). You can write and explain your decisions in your Teacher's Journal.

Now prepare a short written or diagram report about the pupils' experiment.

A pupil group wants to perform an experiment to find out if objects float or sink. They gather everyday objects (stone, spoon, paper, leaf) and fill a bucket with water. Each pupil drops an object into the bucket.

What happens?

Reflect

Match the ways of communicating with the right activities

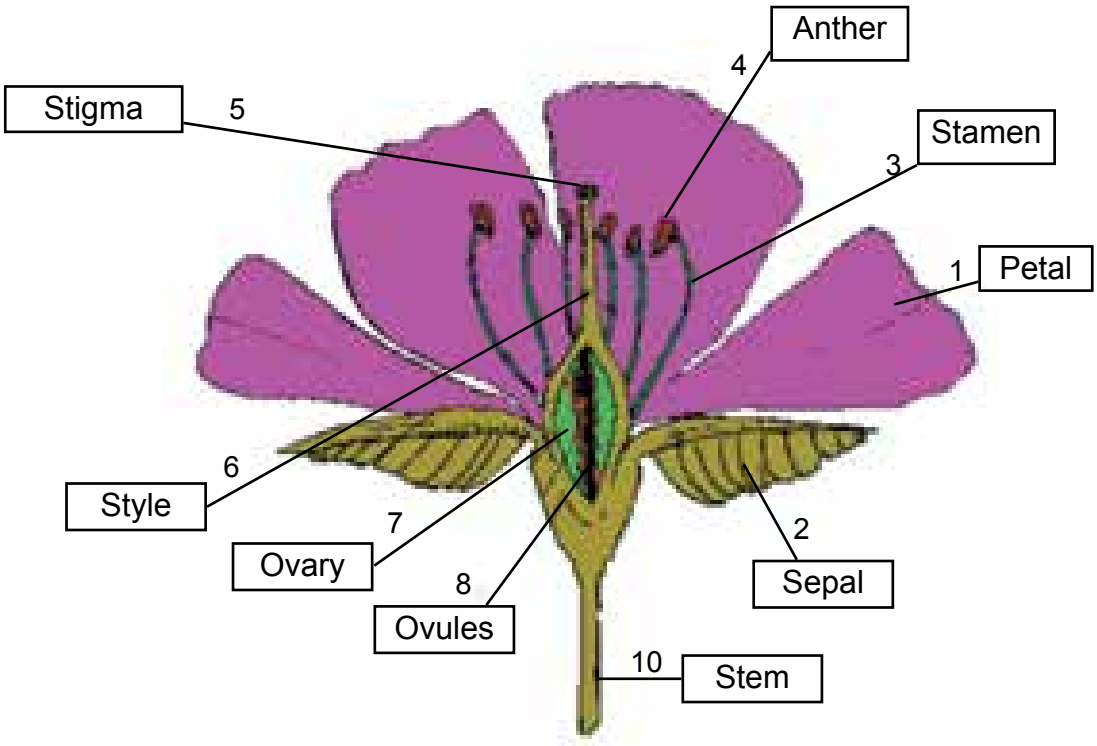
Ways of communicating	Activities
Drawing	Acting out an event
Writing	Looking at images
Discussion	Illustrating an event
Drama	Giving an opinion
Pictures	Noting what you see

Work with your partner in school

With your partner, study the diagram below. Cover up the diagram and communicate the information in it to each other verbally. Now try to communicate it by drawing or writing.

You may use your Teacher Journal for this.

Parts of a Flower



Section 3:
Classifying (Grouping)

Classification in science is used to sort things such as materials, plants and animals into groups, based on observable similarities. For example, living things can be observed to be different from non-living things. Classification is one of the basic science process skills which is also useful in other subjects such as Maths, and English. It would be difficult to remember everything about every animal in the world. Therefore classification helps us to organise and remember our knowledge. For example, if an animal is classified as a cat, we already know that it has a backbone and that it eats meat.

After observing, it is useful to organize the information to better understand it. Classifying will help you do that.

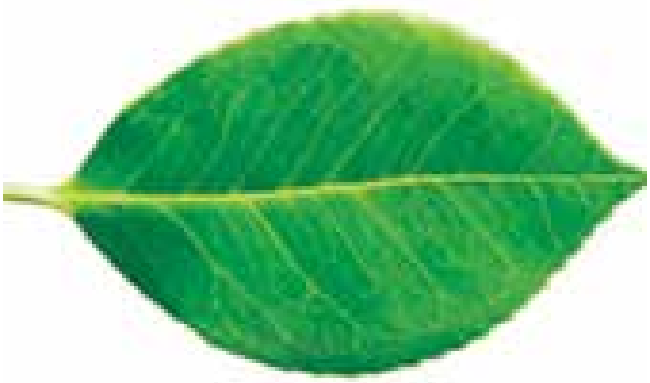
Think

1. When did you last teach classifying (or grouping) in the class?
2. In what way do your teaching activities for grouping encourage pupil's participation?
3. A child might think that a car is alive because it moves. What other observations could you ask a child to make to find out whether or not a car is alive?

Read

1. Answer True or False to the following statements about classification.
   a. Classifying can only take place after gathering of information or objects?
   b. Classifying is one of the basic science skills?
   c. Classifying cannot be done in the class?
   d. Classifying can be according to colour or size?
   e. Classifying cannot be done in a science lesson?
2. There are some photographs of objects in the next page. Classify them into alive or not alive objects by completing the table below. Add 3 more objects to each column of your table.

Cup



Leaf

Balloon

Pillow

Apple

Bag

Part of a plant	Not part of a plant

Reflect

You are given the following objects. Think of **two** different ways of classifying them. Draw a table with headings to show the best way of classifying these objects.

carrots, coke, apple, Fanta, mango, tomatoes, grapes, orange juice, onions, sprite, pear, banana, water, peppers, oranges, water..

Work with your partner in school

With your partner, plan a science lesson on classification. You may think about the following as you plan:

1. What do you want the pupils to classify?
2. What everyday objects will you have your pupils use?
3. How will you organize your class? How will you make the lesson fun?

Section 4: Measuring

Measuring is a very important part of science as it helps us to compare data. You can measure the volume of water in a container, the weight or length of an object, the temperature in degrees Celsius and so on. In science, we use non-standard measurements to estimate and describe objects and events. We use standard measurements to determine precisely, such as centimeters on rulers and tape measures for solids and milliliters on graduated cylinders or beakers for liquids. By measuring, we obtain accurate observations which help us to make better conclusions. For example, which of two different sized bottles holds most water? This might be difficult to estimate. A glass with a standard amount marked on the outside would allow you to measure each bottle's contents.

Think

1. What types of things could you ask your pupils to measure in class?
2. How would you help them to find out which bottle holds the most?

Look at the table below. Think about what measuring instrument will be appropriate to measure each of the items listed in the table.

Measuring Cylinder Ruler Weighing Balance Thermometer

Items	What to use
Height of a small plant	
The temperature of hot water	
The amount of sugar that is in a cake recipe	
The amount of rainfall in a month	

Reflect

1. In the reflect section of your Teacher Journal, write down some science topics which will require the pupils to use measuring skills.
2. What measuring tasks could you give to your pupils to improve their skills?

Work with your partner in school

With your partner, discuss and determine what to do in the following scenarios:

1. A teacher has three different cups of water in class. She wants to know which is hottest. Describe what she can do and what she can measure to find out.
2. Each pupil in the group brings in a container. Describe what the pupils can do and what they can measure to find out which one holds the most.
3. A pupil has been growing a plant over the last two weeks. Describe what the pupil can do and what they can measure to find out.
4. How would you plan a lesson to let your pupils measure things about the weather?

Section 5:
Inferring (concluding)

Inferring describes the skill of drawing conclusions based on our observations. Observations are direct evidence about something; inferences are the interpretations or explanations we make from this evidence. For example, if your dog always barks every time somebody opens your gate, you may infer that somebody is opening your gate when the dog barks. But our inferences may not always be right; they have to be tested. Perhaps the dog also barks when he is hungry.

A good science teacher will understand the importance of inferring correctly, based on information gathered through observing. To help your pupils to think about the meaning of their observations, you can ask 'open' questions. These are questions that don't have an obvious 'right' answer. Questions like…. What did you observe? Why do you think that happened? How would you find out more about this? These also assist pupils in linking what they have observed to past experiences to enable them to draw meaningful inferences.

Think

1. What inferences (conclusions) based on observations have your pupils made whilst learning science in the past?
2. What inferences have you made about how pupils learn best (in Science or in any other subject)? What observations were important for you to make these inferences? What impact did your inferences (conclusions) make on your teaching?

Below is a table. For each statement in column A, write an inferences in column B.

A. Outside the school, children	B. To learn well, my pupils should
Love being active	
Are strong verbal communicators	
Enjoy drawing	
Respond well to positive praise	

Reflect

Fatima wants to practice inferring in class. Put the steps for the *'Solve the black bags mystery'* activity into the correct order.

1. Before class the teacher hides different objects inside 4 black plastic bags. (chopped onions, metal staples, pebbles, chopped apple.
2. Pupils test their inferences by opening the bags.
3. Teacher guides the pupils in how they can use senses of smell and touch to investigate the contents of the bags.
4. Pupils use their observations to draw conclusions about what is in the bag.

Work with Your Partner in School

With your partner, plan a lesson on inferring that also uses objects or materials that are hidden from the pupils' view. To do this, think about the following:

1. The materials you will use.
2. How will the pupils infer (e.g. by smelling, touching or hearing)?

Section 6: Prediction

Another important science process skill that science pupils and teachers need to develop is prediction. Have you ever heard of the term prediction? Are there times in your life and work when you have predicted that certain things will happen? Did it happen? Why did you make the prediction? A prediction refers to a forecast

or guess about something that may or may not happen in the future. In science, predicting is based on evidence, on observations and knowledge; it is more than a guess.

A good science teacher therefore needs to be able to teach pupils how to make predictions. Predicting is based on careful and detailed observations and the conclusions drawn from these observations. When we make predictions in science, we process data (information) from what we have observed as well as

from our past experiences. This is why we say that predicting is more than just guessing. In this section, we will consider ways that the science process skill of predicting can help to make our science lessons more fun and interactive.

Think

1. Think about an activity you have used with your pupils in the past that required them to predict. What was the activity?
2. How did you pupils respond to the lesson?
3. Did they show an understanding of predicting? How could you assess their understanding at the end of the lesson?
4. What would you do differently if you were to teach the same lesson to your pupils now?

   Record your thoughts in your Teacher Journal.

Look at the photographs. What more information do you need (from observations or your own past experience) to be able to predict what will happen next?

A football game between two football clubs

Cloudy weather

A pregnant woman

An over loaded motorcycle

1. What predictions can you confidently make about your own science teaching based on your experience of reading this and other teacher's guides?
2. How do you think pupils practicing the skill of prediction can be included in your Science lessons?

Reflect

1. Identify three science topics that will require the use of predicting skills.
2. How would you ensure that your science pupils acquire predicting skills?

Work with your partner in school

With your partner, plan a Science lesson that requires the use of predicting skills. You may think about the following questions as you plan:

1. What will your pupils **be** predicting?
2. How will you organize your class to ensure active participation of every pupil in the lesson?

Summary of the Module

Science should be fun for your pupils because it is ACTIVE. For effective teaching and learning of science in schools it is important that pupils practice the six science process skills in this module by doing the science lessons' activities. Teachers themselves also need to master these process skills so that they can help their pupils to develop them and can model their use in the classroom. Pupils who are taught science content with the accompanying science process skills will enjoy the experience and also be creative and thoughtful about the subject. They are likely to become more interested in science and to have more positive attitudes towards science subjects.

Experiencing change in your classroom

In your Teacher Journal, write about your experiences of trying out some of the suggested activities from this module in your classroom. To guide your writing, think about:

1. Which activities did you try out in your classroom?
2. Which ones went well? Why?
3. What will you do differently next time you teach the same topic?

Suggestions for the next cluster meeting

Find some time to discuss areas that you would like to share and discuss in your next cluster meeting with your partner. Think about the following issues as you prepare for your next cluster meeting:

1. What challenges have you been faced with in the course of trying out the contents of your science process skills module?
2. Were you able to overcome such challenges? If yes, how? If no, seek the advice of other teachers or Teacher Facilitators at your next cluster meeting.
3. How easy or difficult is it for you to teach your pupils to use the science process skills?

Module 8:
Basic Science

Module 8:
Basic Science

When we say science, what comes to your mind? - you might say something about living and non-living things or facts about the Earth's weather or about gravity. Primary Science means different things to different people. You teach Science to help children know and understand the world that they live in. Science includes knowledge, practical skills and thinking skills. We worked on those skills in Module 7 – can you list them?. These basic scientific skills are important in developing your pupils' thinking and creativity. It also helps them to undertake scientific investigations.

The aims of your teaching must include helping children:

- to be aware of their own ideas and those of others;
- to apply ideas to a problem or situation;
- to test the strength and effectiveness of ideas;
- to reflect critically on how ideas have been tested and used by others.

Most important of all is that your pupils enjoy DOING active Science and carry out simple classroom experiments using locally available materials.

Objectives of the module

By the end of this module, teachers should be able to:

- Distinguish between temporary and permanent changes.
- Identify the different types of teeth and their functions.
- Demonstrate knowledge of erosion, its danger and control measures.
- Explain the rotation and revolution of the earth.
- Describe applications of air pressure in our everyday life.

Scientific terms used in this module

- Temporary
- Permanent
- Molars, premolars, canines and incisors
- Erosion
- Air pressure
- Mixtures
- Gases
- Rusting
- Melting, axis
- Sphere/spherical

Section 1:
Temporary and Permanent changes

We investigate changes in Science in order to explain what is happening. Something changes when it shifts from one condition to another. For example, ice in your warm hands melts to form water; iron left outside in the rainy season will corrode to form rust; you can use heat to bake dough into bread. Such changes occur around us every day. A change can be temporary or permanent. Temporary changes can easily be reversed – the new form will change back to the original one if the conditions are right. For example, water can be refrozen to change it back to ice. Permanent changes cannot be easily reversed. The new form is fixed. For example, the rust cannot be easily changed back to iron.

Think of other examples of temporary and permanent changes?

Think

1. How have you taught about temporary and permanent changes in your class before?
2. What materials and examples did you use to teach the topic? (Children often need a lot of different examples to understand the concept).
3. What kind of science skills (see the list in Module 7) did you develop with pupils whilst teaching the topic? How did you do it?

Watch the video clip 8.1. Think about the following questions as you watch. You can write your answers in your Teacher Journal.

1. Draw a table to represent all the temporary and permanent changes seen in the video.
2. Circle the science process skills that you saw in the video

   Prediction observation measuring classifying
3. What activities were the pupils asked to do in the clip?

   How could the teacher have involved the children more?
4. Can you spot the mistakes that the teacher made when identifying permanent and temporary changes?

Reflect

Based on the video clip you watched, complete the following tasks. Use your Teacher Journal to write down your answers.

1. Between the use of simple classroom experiments and lecture methods which do you consider as the most appropriate for teaching temporary and permanent? Give reasons for your answers.

2. In the blank space below, suggest some other teaching materials that can be used to teach temporary and permanent changes, apart from the ones used in the clip.

_____

_____

_____

_____

_____

Work with your partner in school

1. Study the lesson plans for next week and identify what teaching aids you will need to develop for your lessons.
2. Discuss the relevant science skills (refer to module 1) that you are planning to emphasize in your next lesson.

   Keep note of your discussions and plans in your Teacher Journal.

References

Look at the P4 Science and Technology lesson plans to see another lesson on temporary and permanent changes.

Section 2:
Human body (teeth)

The human body has various parts, the head, eyes, arms, legs and so on. In this section, we will be learning about the part of the human body called

'the teeth'. Have you ever looked at your teeth in the mirror? Have you observed the size and shape of your teeth carefully? We have different kinds of teeth. Have you ever wondered when you eat an apple why you always bite it at the front of your mouth, while if you are chewing gum you put it to the back? This is because we have different kinds of teeth for different roles depending on the type of food we eat. Adults have 32 permanent teeth which replace the 20 milk teeth of young children. This section will help you understand the role of each type of tooth..

Think

1. What kind of teaching aids would you ideally use for teaching about "the teeth"?

2. Use a mirror to identify 4 different types of teeth in your mouth. Molars are large, flat and wide; premolars are smaller, flat and wide; canines are pointed; incisors are like chisels. How many of each do you have?

   How would you alter this activity to use it with pupils?

Watch the video clip 8.2 and observe the way the teacher involves the pupils in the activity. As you watch the clip, take note of the following statements and decide whether they are true or false.

1. The teacher made good use of the teaching aids to show pupils the different types of teeth.

2. The girl in the video tore the meat with her canine teeth.

3. The teacher allowed individual pupils to locate the positions of the different types of teeth themselves.

4. The teacher wrote "incisors" next to "apple" on the chalk board.

   Complete this sentence "The lesson can be improved by……"

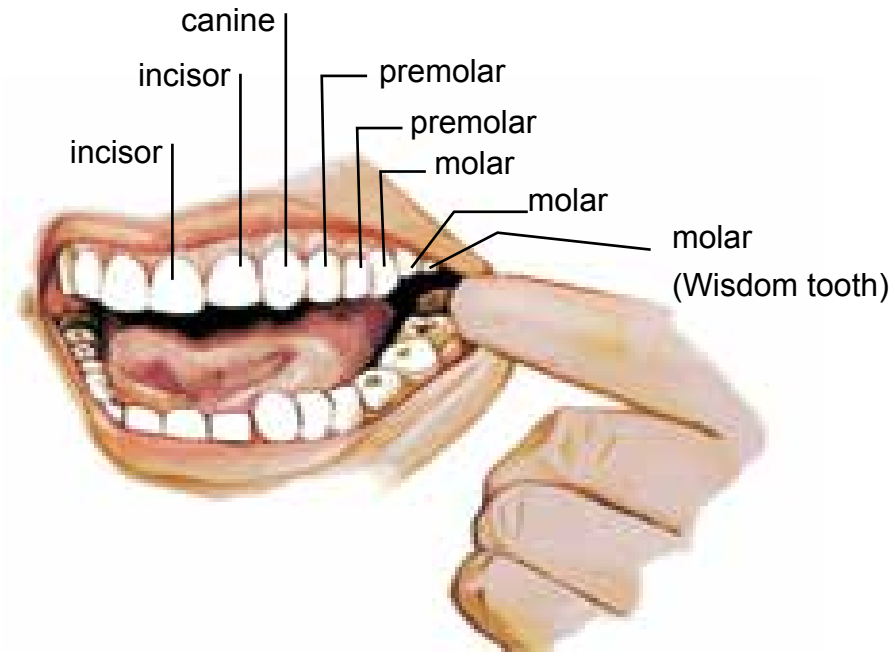
Reflect

In the reflect section of your Teacher Journal, write down your thoughts on the following questions.

1. 1. How will you encourage pupils' participation in a larger class?
   a. Putting pictures all around the classroom
   b. Asking open questions like why, how, and what
   c. Inviting pupils to the front of the class to contribute to the lesson d. All of the above..
2. 2. Make a list of five common foods/fruits you eat and write the part of your teeth you usually use in eating each of them (observe that, for some you need to use your canines for tearing, others require you to use your incisors for cutting or biting, while some require you to use your pre- molars and molars for chewing).

Work with your partner in school

1. Study the diagram of the teeth below and identify the positions of the different types of teeth in your mouth.



2. Share some food together. Now discuss the following questions with your partner and record your answers in your Teacher Journal..
   a) a) In the human teeth, the ……..are located at the …….. They are used for biting.

b) In the human teeth, the …… are located next to the incisors and are used for tearing off pieces of food.

c) In the human teeth, the …… and …… are found at the sides of the jaws. They are used for ----------.

References

Look at P4 lesson plans to see another lesson on teeth.

Section 3:
Wind erosion: its dangers and control measures

Erosion is when small pieces of rock are transported by wind, water and gravity. For example, the top layer of soil is worn away by the wind.

Erosion is an example of change in the environment. There are many others such as rivers that dry up in the dry season and overflow during the rainy season.

The wind can blow loose soil away. Do you know what causes wind erosion? Human activities, such as road construction, farming, building of houses and grazing of farm animals, etc. break the soil into smaller pieces. These are very light and when the wind blows, the top layer of the soil is blown away. The land suffers erosion.

Think

1. How have you taught erosion to your pupils in the past?
2. What challenges (if any) did you face when you taught wind erosion to your pupils?
3. Put some sand and soil on the palm of your hand and blow over it. Can you see any pieces moving? How could you use this simple experiment to involve your pupils in investigating wind erosion?

Watch the video clip and 8.3 and think about the following questions as you watch. You may use your Teacher Journal to make note of your answers.

1. What was responsible for the movement of the soil in the clip?
2. The teacher claimed that the soil moved because it was loose. Yet the stones are loose and they didn't move. What conclusions (or inferences) can you make about why the soil moved?
3. How do farmers reduce or prevent the displacement of top soil by wind in our environment? (You can research this question in books or on the internet.)

Reflect

Based on the video clip you saw, some materials were used to model what happens in real life. Match the right material with its purpose.

Material in the model	**represents**
Sand	the wind
Branches and stones	plants and ground cover
Cardboard	the soil
Paper	the hard ground underneath

Apart from the activity used by the teacher in the clip, what other simple activities can you use to teach soil erosion?

List other factors that can cause erosion?

Work with your partner in School

1. Discuss together how wind erosion is a problem for our country and share your research on how it is reduced.
2. Review your lesson plan for the lesson and make preparations to include practical demonstration or pupil activities related to the topic.

References

Look at the P5 lesson plans for more lessons on erosion.

Section 4:
The earth and its movement (rotation and revolution)

The earth is the planet in the universe where humans are found. The earth is spherical and rotates around its axis thereby causing day and night. When one half faces the sun it is day-time there. The other half will face away from the light and it will be night-time there. One rotation takes 24 hours, a day plus a night.

The earth also moves round the sun. It takes just over 365 days, one year, for the earth to go around the sun once. This is called one revolution of the earth. The revolution causes the different seasons.

Think

1. How have you taught this lesson in the past?
2. What materials did you use to teach this topic? How did you include pupil activities?
3. How did you make sure the pupils knew the difference between the two types of earth movements (i.e. rotation and revolution)?

Watch the video clip 8.4. Think about the following questions as you watch. Circle the correct answer.

1. The teacher used the following materials in her model
   a. ball and torch light
   b. globe and torch light
   c. all the above
2. The earth's movement is known as
   a. revolution and rotation
   b. movement and rotation
   c. revolution and turning
   3. What did the girl in the video do with the globe:
   a. shook the globe
   b. bent the globe
   c. rotated the globe
4. When the light shines on the earth those countries have their
   a. daytime
   b. night time
   c. evening

5. Which type of classroom management did the teacher use in the video?
6. How could she have involved all the pupils in the activity? What factors will she need to take into consideration to try this?
7. The teacher pointed to the right of the globe and said that was East. Why would this confuse her pupils?
8. Did you spot the mistake that the girl made when rotating the globe?

Reflect

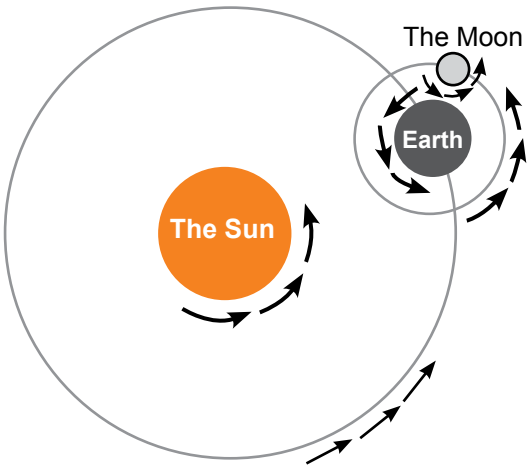
Write 'true' or 'false' in front of the following statements:

1. The earth rotates on its axis.
2. The movements of the Earth are called revolution and rotation.
3. One revolution is quicker than one rotation.
4. The earth moves round the sun in 365 days.
5. The earth's orbit is a perfect circle.

What other teaching aids will you use to teach the Earth's movement?

Work with your partner in school

With your partner, study the diagram about rotation and revolution below, then do some research about rotation and revolution by reading text books or checking the internet. You may use your Teacher Journal to record findings.



References

Look at the P6 lesson plans for more lessons on the earth and its movement.

Section 5:
Air Pressure

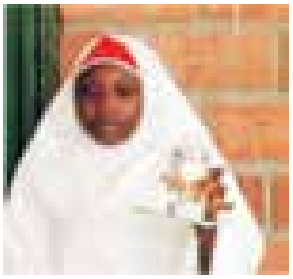
The air around you has weight, and it presses against everything it touches. That pressure is called atmospheric pressure, or air pressure. Air pressure changes with temperature. In fact, it's one of the most important factors that determine what the weather is like. Changes in air pressure, especially quick changes, can also affect your body. The most obvious of these are the discomfort or even pain that you feel in your ears when you gain or lose altitude rather quickly, e.g. in an aircraft. There are many fun activities that can be done in the class to teach air pressure to your pupils. This section will help you to understand the concept of air pressure and also show you some simple techniques that can help you teach the topic.

Think

1. What everyday examples can you use to demonstrate applications of air pressure in the classroom?
2. In what ways can you involve the pupils as learning resources in teaching the concept of air pressure?

Watch the video clip 8.5 and complete the following task.

1. Re-order the following photographs to show the experiment that happens in the video clip. Please also describe the actions happening in each picture. In the final one add a sentence to explain why the water does not fall out.

Reflect

Based on the video clip you watched, think about three things you liked about the way the teacher taught the lesson and three things you think could be improved, then complete the table below.

Things I like that the teacher did	Things I think that could be improved

Work with your partner in school

1. Together with your partner, try to perform the experiment in the video.
2. Discuss with your partner how air pressure is used in our everyday life. (One example would be to inflate a car tyre).

   Can you name some things that depend on air pressure?

References

Look at the P6 lesson plans for more lessons on air pressure.

Summary of the Module

The purpose of teaching basic science to primary school pupils is to develop knowledge and skills and ways of investigating things. In this module, you have been introduced to teaching selected science topics by using locally available materials. The basic science process skills of observation, communication, classification, measuring, inferring and prediction were also practiced. To successfully teach science to your pupils, you need to think about including opportunities to develop these skills in all your lessons so that pupils learn to think scientifically as well as to learn information and understanding.

Experiencing change in your classroom

In your Teacher Journal, write about your experiences of trying out some of the suggested activities from this module in your classroom. To guide your writing, think about:

1. Which activities did you try out in your classroom?
2. Which ones went well? Why?
3. What will you do differently next time you teach the same topic?

Suggestions for the next cluster meeting

Find some time to discuss these areas with your partner before your next cluster meeting.

1. What challenges have you been faced with in the course of trying out the contents of your basic science sessions?
2. Were you able to overcome such challenges? If yes, how? If no, seek the advice of other teachers or facilitators at your next cluster meeting.
3. How easy or difficult is it for you to carry out simple activities in your Basic science class?

Module 9:
Basic Technology

Module 9:
Basic Technology

Imagine if there were no cars, bicycles and trains; how would you move from one place to the other? Now think if there was no cup, plate, pot or other kitchen utensils; how would you cook or eat your food? What do you think would happen if there were no clothes to wear? Children often don't know how clothes are made, cars are built or cups and plates are made.

Science and technology are not the same thing. In Science, we generate reliable knowledge by collecting and interpreting evidence. Technology makes use of some of that knowledge to solve problems and meet human needs. Examples of technology help children to understand the science. But a car or a cell phone is not 'science'. It's just that its operation relies on scientific knowledge. Modern technology includes complicated machines like airplanes but also designs that humans invented many years ago, such as pot making and use of fire. In this module, we will focus on understanding technology.

Objectives of the module

By the end of this module, teachers will be able to:

- Construct the shapes of different objects using paper, wood or metal
- Use charts and pictures to identify and name various sources of energy
- List and identify the internal parts of a motor vehicle
- Discuss the differences between heat and temperature

Scientific terms used in this Module:

- Thermometer
- Motor vehicles
- Light energy
- Electrical energy
- Heat energy
- Work
- Energy
- Instruments
- Temperature
- Heat
- Shape construction
- Technology

Section 1:
Shape construction

We use different shapes to construct houses and bridges and objects like cars. Can you think of some? Common shapes of objects around us include squares, circles, triangles, rectangles, cubes, cylinders. A pipe is a cylinder because that is a strong shape for carrying liquids. A roof will often be curved, also for strength. A car has a box-like structure. To make solid objects from different shapes is known as shape construction. Solid objects of different shapes can be made from materials such as wood, metals, plastics, clay or papers. Tools are used to fold (hands), bend (pliers), cut (scissors) and join (nails, glue) the material. The method depends on the material used for the shape construction.

Shape construction is important for our primary school children because:

1. Each shape is more suited for a particular purpose. For instance, because a curve turns easily, a car or bicycle has curved wheels.
2. Children can understand the shapes used to construct their local environment. For example, the metal or wood beams that hold up most houses form rectangles, squares and triangles.
3. Shape construction is a fun and creative activity.

Think

1. Have you ever taught your pupils how to make solid shapes?
2. What type of shapes did your pupils make?
3. What kind of materials and tools did you use in teaching your pupils how to make solid shapes?
4. A poster can show different types of shapes used in construction near the school. What would you include?

Watch the video clip M9V1 and think about the following questions.

1. How did the teacher engage the pupils during the lesson in the clip?
2. Identify and classify the materials used for the lesson activity using the table below.

Low cost materials	No cost materials

Reflect

1. Describe in your Teacher Journal two things that you saw in the video clip that interested you. What pupil activities could be added to this lesson?

2. Complete the table below by naming and drawing the solid shapes that you can make using the materials (the first one has already been done for you as an example)::

Material	Method	Shape
Paper	**Fold and stick**	Cylinder,  cube. 
Clay		
Straw		
Metal		

Work with your partner in school

Carefully study this section of the module and do the following:

1. Individually make a list of the solid shapes you can try out in your class and the best materials to make each solid shape.
2. Exchange the list with each other and jointly discuss the ways of making the solid shapes.
3. With just paper, cellotape/masking tape and some stones, how could you engage your pupils in using shape work to build a bridge for a toy car.

References

Look at the P 4 lesson plans for more lessons on shape construction.

Section 2:
Sources of Energy

Energy causes things to happen around us. During the day, the sun gives out light and heat energy. At night, street lamps use electrical energy to make light for our roads. When a car drives by, it is being powered by petrol which has stored energy. The food we eat also contains stored energy which we use to work and play. There are different forms of energy such as heat energy, electrical energy, light energy. One form can be changed into another form.

There are different sources of energy. Sources of energy include the sun, tides and waves, the wind, falling water and fuels such as petrol, wood and food. Energy is a difficult abstract idea for children to grasp, partly because our everyday language gets in the way of scientific understanding. For example, we say that "I've lost all my energy" but energy cannot be used up. It can only change from one form to another. In this section, we are going to learn about ways that you can teach sources of energy in a more meaningful way.

Think

1. When last did you teach sources of energy to your pupils?
2. Which activities did you do with your pupils during the lesson?
3. Which activities captured pupils' attention?
4. Looking back at the lesson, what would you do differently if you were to teach the same lesson again?

Watch the video clip 9.2 and observe the activities done in the lesson carefully, thinking about the following questions as you watch.

1. How did the teacher introduce the lesson?
2. The teacher does the activities in this lesson. How could she have involved the pupils more in some of these?
3. State an activity in the video clip that involved pupils learning by themselves.
4. The teacher describes heat and light (of the candle and the sun) as the same thing. What would you say to correct her.

Reflect

1. List other energy sources not used in the video.
2. Complete the following table (the first one is already done for you):

Source of energy	Type of energy it gives out	Uses of the energy
Sun	light, heat (solar energy)	used for drying materials, warming water, seeing objects in day light etc.
Kerosene		
Batteries		
Charcoal		
Electricity		

Work with your partner in school

1. How can the lesson you watched in the video clip be improved?
2. Develop an activity that your pupils can do in groups when you teach sources of energy.

References

Look at the P4 and 5 lesson plans for more lessons on sources and forms of energy.

Section 3:
Parts of motor vehicles

We are all familiar with motor vehicles. They are all around us, in different shapes, sizes and types. Cars, motor bikes, trucks, buses, etc. are examples of motor vehicles that we use in our daily lives. Vehicles are an important example of very useful technology and are also of potential danger to children. Although motor vehicles look different and are used for different purposes based on their size and strengths, they all share similar internal and external parts. How familiar are you with the parts of the motor vehicles?

Fill in the table below with at least five external and five internal parts of a motor vehicle

.

External Parts	Internal Parts

Well done everyone! In this section we will be looking at how we can teach children to identify the different parts of the motor vehicle in a fun and engaging way.

Think

1. Have you ever taught your pupils this topic?
2. What teaching materials did you use when you taught your pupils this topic?
3. What challenges did you encounter when you taught your pupils this topic?

Watch the video clip 9.3 and think about the following questions as you watch:

1. How did the teacher encourage the pupils to participate actively in the lesson?
2. What teaching materials were used by the teacher?
3. How did the teacher assess pupils understanding of the topic she taught?
4. Match the following parts with their uses:

Brake	to change engine speed
Steering wheel	to hold you to your seat
Seat belt	to stop the car
Gear	to change direction

Reflect

The video clip showed different ways of teaching ‘naming and identification of basic vehicle parts’’.

1) Did you note the different methods of teaching used in the clip to present the lesson? Write them in your Teacher Journal.

2) Complete the table below:

Two things I liked about lesson in the video clip	Two things I would improve about the lesson in the video clip

Work with your partner in the school

1. Discuss how you can develop the pupils' science process skills of classification and communication in the lesson you have just watched in the video clip. What safety points should you stress to pupils when showing them a car?
2. Play a game with your partner. See how many parts of a vehicle you can write down within three minutes. The person with the most words wins. Discuss what each part is used for. Could you try this is a lesson?

References

Look at P 4 lesson plans to see more lessons on parts of a vehicle.

Section 4: Temperature

A lot of people confuse heat and temperature but they are two different things. When you are not well and someone touches your head they can feel whether your body is hotter. They don't know its temperature though until they measure it. When you hold a glass of water, it may feel cold to you and warm to someone else. You can measure the temperature to be exact. A hot object will have a higher temperature than a cold object. We cannot tell exactly how hot or cold a substance is by just touching it. Instead, we use an instrument called a thermometer to measure its temperature.

Think

1. How have you taught temperature before to your pupils?
2. What materials did you use in teaching the topic?

Watch the video clip 9.4 and think about the following questions as you watch:

1. How did the teacher make pupils apply the skills of observation and classification in the video?
2. What was the purpose of the candle in the video?
3. Draw two other objects that were on the table in the video?

Reflect

1. How would you improve the strategies used in the clip in order to increase pupils' participation in the lesson?
2. What other teaching materials can you use to teach the same topic to your pupils?

Work with your partner at school

1. Fill in the table below by adding three everyday things to each column.

Hot	Warm	Cold

2. How would you continue this lesson to introduce pupils to the idea of using a thermometer to measure temperature?

References

Look at P5 lessons plans for more lessons on temperature.

Summary of the Module

In this module we have seen the importance of teaching basic technology in our schools. Compared to when we were growing up most things around us are now based on advanced technology. Twenty years ago there were basic vehicles to take us from one place to another. Nowadays vehicles include complex technology such as air bags, CD player, A.C etc. Pupils should know and understand basic technology to enable them to be flexible and confident contributors to our modern society. The module enables you to have a good understanding of some of the concepts you will be teaching in your basic technology lessons. Strategies that you can adopt for effective delivery of your basic technology lessons are also provided. Adopting these strategies when teaching your pupils will not only help them understand the concepts but most importantly, it will help them develop a keen interest in technology. They will also help your pupils to enjoy and participate actively in lessons.

Experiencing change in your classroom

In your Teacher Journal, write about your experiences of trying out some of the suggested activities from this module in your classroom. To guide your writing, think about:

1. Which activities did you try out in teaching the lessons?
2. Which ones went well? Why?
3. What will you change when you do the same activities next time?

Suggestions for the next cluster meeting

Think about what you wish to discuss in your next cluster meeting with your partners or the teacher facilitators. It could be challenges you encountered during your lessons or topics that you found difficult creating class activities for. Please write down the topics in the space below:

_____

_____

_____

_____

_____

Module 10: Information Technology

Module 10:
Information Technology

The coming of computers has changed the way we store, retrieve and send information. The process of storing, retrieving and sending information using computers and other electronic devices is what we call Information Technology (IT). Have you ever wondered about what a computer really is and what it does? A modern computer is simply an electronic machine that is designed to manipulate data. We input the data as letters (e.g. A, B, C, etc.), digits (e.g. 0, 1, 2, 3…..), punctuation marks (e.g.?,;! etc.) and other symbols.

The computer then quickly and accurately follows a step-by-step set of directions or instructions (called a computer programme) that has been stored in its memory. Later the information and the computer's results can be retrieved. These general purpose machines help to store information, solve problems to control other machines in almost every human activity e.g. schools, hospitals, markets, offices, banks and so on.

Objectives of the module

By the end of the module the teacher should be able to:

- Identify functions of hardware components of computer
- Describe computer as input- process –output system
- Identify common IT gadgets
- List ways of taking good care of a computer
- Identify some precautions in using a computer

.

Scientific terms used in this module:

- Hardware
- System unit
- Monitor
- Keyboard
- Information Technology (IT)
- Data
- Input
- Output
- Process
- Uninterruptible Power Supply (UPS)
- System
- Component.

Section 1:
Identifying hardware components of a computer and its functions

Do you know that the computer system has two major parts? They are called hardware and software. Both are needed if a computer is to perform any useful task. In this section, we will be looking at how to teach pupils to identify the hardware components of a computer. Computer hardware is the part of the computer system that we can see and touch. Examples are the keyboard, monitor, system unit (central processing unit), and mouse. The CD/DVD-ROM is the information storage hardware of a computer.

Take a look at the picture below of the components that you can see:

The hardware components (parts) of computer

Nowadays desktop computers are being replaced with smaller tablets, smartphones and laptops. Look at the laptop below and identify the same parts as above?

Do you know what each part does?

- The keyboard consists of letters and numbers that you use to inform the computer.
- The mouse can be attached to the computer to move items on the screen. A tracker ball which does the same job might be part of laptop's keyboard.
- The monitor is the screen of the computer.
- The system unit contains the main processing component of the computer.

Think

1. What variety of computer hardware have you seen or touched or used?
2. How will you involve pupils in doing activities for this topic?

Watch the Video clip 10.1 and think about the following questions as you watch.

1. Where are these major parts of a computer hard ware?
   - monitor
   - keypad
   - mouse
   - operator
   - system unit
   - keyboard
2. Draw below any hardware component of a computer from the video you saw.

Reflect

1. Based on the video clip you just watched, complete the table below by writing the functions of the major hardware components of a computer:

S/N	Hard Ware	Function
1.	Monitor	
2.	Mouse	
3.	System Unit	
4.	Keyboard	

Work with your partner in school

1. With your partner, plan a lesson on major parts of the computer hardware using teaching aids that are locally available to you.
2. How could you use pupils' mobile phones to teach them about hardware parts?

References

Look at the P4 lesson plans for more lessons on computer hardware.

Section 2:
Information technology (IT) gadgets

Do you know how messages were sent from one person to another about thirty years ago? The most common way would have been through posting letters or talking face-to-face. Maybe a few people had telephones in their offices and homes. Compare with communicating nowadays. It is very easy to send and receive messages from any part of the world instantly through electronic mail, telephone, SKYPE etc. All these modern ways of communication rely on Information Technology (IT). This provides a faster and easier way of receiving, processing, storing, passing and sending information. IT gadgets include mobile phones, laptops, tablets etc.

Think

1. How have you taught about IT gadgets (mobile devices) in your class before? Have you used any with pupils?
2. What teaching materials did you or would you use for the topic?
3. How did your choice of teaching aids encourage pupils to actively participate in the class?
4. Looking back now, what would you do differently? Why?

Watch tthe Video clip 10.2 and think about the following questions as you watch:

1. What IT gadgets/devices did you see in the video.
2. What would you use to?
   - take photographs
   - send electronic e-mails

- talk or text to another person
- work with numbers

3. What parts of the teacher's method encouraged the pupils to participate in the class?

Reflect

Based on the video clip you just watched, complete the following task:

1. Circle the IT gadgets in the list below:
   - Computer
   - Kerosene stove
   - Mobile phone
   - Remote control
   - Electric kettle
   - V-sat dish
   - DVD Player
   - Calculator
   - Tablet
2. What other teaching aids can you use to teach this topic apart from the gadgets used in the clip?
3. The teacher in the clip seemed to be very familiar with the topic. Do you think that helped her in effectively teaching the pupils? Why?

Work with your partner

Discuss the following with your partner in school.

1. What other teaching aids can be used to teach this same topic in your own school. For example, you could make drawings or use magazine photos of various IT gadgets to make posters. You could have pupils use their phone cameras to record what an insect does.
2. How can you encourage your pupils to be very involved if you were to teach this topic in your Information Technology class? Suggest some activities and record your suggestions in your Teacher Journal. For example, how could they use their mobile phones.

References

Look at P 4 lesson plans for more lessons on I.T. gadgets.

Section 3:
Care and protection of computer

We have seen how important the computer is to us. One advantage of the computer is that it makes our work easier. Just like any other machine, for the computer to work efficiently and last long, it has to be properly taken care of. What then does it mean to take care of the computer? Care and protection of the computer simply entails any action taken to keep it working or to restore it to a good working condition. If the computer is not properly taken care of, it may breakdown or be inefficient. This situation will be inconvenient to us. In order to prevent the breakdown of computer, there should also be regular physical and technical protection.

Think

1. Why do we have to care for and protect the computer?
2. How have you taught care and protection of computer before?
3. What class activities did you use to teach this topic?
4. Were your pupils interested in the lesson? What do you think was responsible for their interest or disinterest in the lesson?

Watch the Video clip 10.3 and think about the following questions:

1. How did the teacher introduce her lesson? Circle the correct answer
   - by drawing a spider diagram
   - by using flash cards
   - by asking questions
2. Name three things the pupils wrote on the diagram
3. How did the teacher carry out assessment of the work in the video? Tick the correct answer
   - By asking the pupils to feedback
   - By asking the pupils to draw
   - By copying the work in their exercise books.

Reflect

Based on the video clip you saw, answer the following question in the 'reflect' section of your Teacher Journal:

1. Mention four ways of protecting or caring for a computer.
2. What are the possible challenges you might face if you were to teach this topic to your own pupils using the approach of the teacher in the clip?
3. How can you overcome such challenges?

Work with your partner in school

1. Plan a practical lesson together that you can use to demonstrate to pupils, various ways of taking care of the computer.

References

Look at P 5 lesson plans to see more lessons on caring for your computer.

Section 4:
Care and Protection of the Computer User

The use of computers offers many benefits but could also cause us some harm if we fail to take necessary precautions. Being careful will help to keep our computer systems functional and also keep the user safe and healthy. What then do we mean by precaution? Precaution simply means something that is done in advance to prevent harm or trouble from happening. Therefore, precautions in using the computer are everything we do in order to prevent possible damage to our computer or to ourselves. Some of these things include having a proper sitting posture so we don't hurt our backs, proper positioning of the monitor to prevent damage to our eyes, use of stabilizers that can prevent problems caused by surging currents etc.

Think

1. What precautions do you take when using computers?
2. How have you taught this topic in your class before?
3. How did you make sure your pupils were actively involved in the lesson?

Watch the Video clip 10.4 and think about the following questions:

1. What might happen if you stare very closely at the computer monitor?
2. How should the computer cables be arranged to prevent people tripping over the cables?
3. When using the computer, how should the user sit, and why?

Reflect

1. How did the teacher introduce the lesson?
2. The second half of this lesson is more effective than the first half. Why is that?
3. If you were going to teach this lesson, what might you have done differently?.

Work with your partner

1. How can damage be caused to the computer?
2. How can damage be caused to the computer user? Discuss and write down your shared ideas in your Teacher Journal.

References

Look at your P 6 lesson plans to see more lessons on precautions in using a computer.

Summary of the Module

Information Technology has become a major part of the basic science and technology school curriculum. The main objective of teaching IT at this level is to enable the learners to understand the basics of Information Technology and to apply their learning to their everyday lives. As an Information Technology teacher you are expected to have a good understanding of the fundamentals of IT in order to be able to teach your pupils effectively. In this module you have learnt about some of the basics which include: functions of hardware components of computer, common IT gadgets (mobile devices), how to take good care of a computer and some precautions in using a computer. You have also learnt about some strategies that you can adopt when teaching your pupils Information Technology from the video clips.

Experiencing change in your classroom

In your Teacher Journal, write about your experiences of trying out some of the suggested activities from this module in your classroom. To guide your writing, think about:

- Which activities did you try out in your classroom?
- Which ones went well? Why?

What will you do differently next time you teach the same topic?

Suggestions for the next cluster meeting

Find some areas that you would like to share and discuss in your next cluster meeting with your partner. Think about the following issues as you prepare for your next cluster meeting:

1. What challenges have you been faced with in the course of trying out the contents of your Information Technology guide?
2. Were you able to overcome such challenges? If yes, how? If no, seek the advice of other teachers or facilitators at your next cluster meeting.
3. How easy or difficult is it for you to carry out simple activities in your Information Technology class?

Module 11:
Health Education

Module 11:
Health Education

What would you say is the most important thing to you in life? Some think that wealth and money are the most important. However, “health is wealth”. If we have good health, we have a great advantage. Health means more than the absence of sickness or injury; a healthy person also has physical, mental and social well-being. Many children and young people around the world face challenging health issues, including hunger, malnutrition, malaria, polio, drug and alcohol abuse, violence and injury, unplanned pregnancy, HIV/AIDS and other sexually transmitted diseases. Some of these affect their ability to learn.

Our own ability to carry out our everyday activities depends largely on how healthy or unhealthy we are. Therefore it is important for children to be taught health education in schools. Health education includes learning experiences which can increase their awareness and knowledge and positive attitude about health issues. By teaching health education in schools, we can promote individual and community health.

Objectives of the module

By the end of this module, you will be able to:

- Describe the uses of at least five contents of a first aid box.
- Explain how to maintain personal safety.
- Explain the importance of nutrition to the human body.
- Identify the signs/symptoms of 3 important diseases.
- Explain the importance of maintaining good health.
- Describe the good and bad use of medicines.

Scientific terms used in this module:

- First aid box
- First aid kit
- Accident
- Bleeding
- Emergency
- Injury
- Prescription
- Treatment
- Prevention
- Control
- Food
- Minerals
- Nutrients
- Safety
- Disinfect
- Contract
- Medicines
- Communicable
- Non-communicable
- Germs
- Hygiene
- Abuse
- Disease
- Infect
- Drugs

Section 1:
First Aid

No matter how careful we are in our everyday activities, it is possible to make mistakes that cause injury or harm. When this occurs, we can help to avoid complications or further damage by applying emergency care or treatment. This called First Aid. All schools should have a First Aid box. Take a look at the list below and tick the items that you think should be in a first aid box. Also think about what is missing from the box.

- Scissors
- Iodine
- Knives
- Necklaces
- Napkins
- Cotton wool
- Syringes
- Spices
- Bandage

From this activity, you can see that some items are relevant to the first aid box while others are not. Necklaces, spices and knives are not suitable for a first aid box as they are of no medical use to the injured person. Syringes should also not be in a first aid box. You may be asking why not? This is because a syringe is a device which is only to be used by trained medical personnel (e.g. doctors and nurses). Only basic medical supplies are stored in a First Aid box.

Think

1. How have you taught First Aid in your school?
2. If yes, think about the challenges you had while teaching it.
3. How do you think your teaching of First Aid can be made active for your pupils?

Watch the video clip 11.1. As you watch the clip, think about the following questions. You may also write your answers in your Teacher Journal.

1. List some of the things that were in the first aid box in the video?
2. How did the teacher involve the pupils in the lesson? The pupils were noisier at the group discussion. Why is that a good thing?
3. What scientific skills did you observe the pupils practicing during the lesson?

Reflect

Copy and complete the following task in your Teacher Journal;

S/N	Name of First Aid Material	Uses
1.		For cutting materials (e.g. plaster, bandages, etc.)
2.	Iodine	
3.	Plaster	
4.		For disinfecting wounds
5.		For relieving pains
6.	Cotton wool	
7.	Bandage	
7.	Bandage	

Work with your partner in school

You and your partner should discuss how you can adapt the game of **"finding friends"** for teaching First Aid in your classrooms.
For this game, you should:

- Write the names of each item in the First Aid box on a flashcard.
- The uses of each of these items should be written on other flashcards.
- Pupils then pick a flash card each.
- Identify the person whose flashcard matches theirs, item with use.
- Once the pupils match up their flash cards, they say I have found my friend

References

Look at your P 4 lesson plans for more lessons on first aid.

Section 2:
Safety education and accident prevention

In the previous section, we learned that good health is very important to us. Sometimes due to our carelessness or that of others, we sustain injuries which affect our health and make it hard for us to do what we need or want to do. Because of this, it is important that we always take safety measures to prevent the occurrence of such injuries. We can therefore promote safety and prevent accidents in our homes, schools and on our roads by providing learners with basic safety education. Safety education involves the teaching of specific knowledge and skills that children need in order to stay safe in any given situation or environment.

Think

1. Have you or anybody you know ever been involved in any minor accident?
2. What was the cause of the accident?
3. Do you think the accident could have been avoided or prevented? How?

Watch the video clip 11.2 and as you watch the clip, think about the following questions. You may also write down your thoughts in your Teacher Journal:

1. In the video the pupils mentioned accidents that can happen at home or at school: what were they?
2. Use numbers 1-4 to put the questions asked by the teacher in the correct order. The teacher asked.
   - What type of accident can happen at school?
   - Whether they have been involved in any accident
   - How the pupils can prevent accidents from happening
   - What type of accident can happen at home?
3. How did the teacher encourage the pupils to participate in the lesson? How could pupils be more active during this lesson?
4. How did the pupils respond to the lesson?

Reflect

1. Do you think the teaching style used by the teacher was appropriate for the lesson? Why?
2. What other activities could you use to teach this lesson?

   Record your answers in your Teacher Journal.

Work with your partner in school

1. What accidents could happen to a child at:
   - Home
   - School
   - On the road
   - In a car
2. Design a classroom poster to show how these accidents can be prevented.

References

Look at your P 4 lesson plans for more lessons on safety education and accident prevention.

Section 3: Nutrition

Nutrition is about eating the correct kinds of food for our body to use. In order to be healthy we must eat a balanced diet. A balanced diet is one that gives your body everything it needs to function properly. A balanced diet will include good sources of your daily nutrients such as fresh fruits and vegetables, whole grains, proteins and water.

There are five main food groups that we should ideally eat something from every day, namely carbohydrates, vitamins, minerals, fats and proteins. People

who eat the right amount from all these food groups tend to be stronger and healthier than those who miss out one group or eat too much of another. Those who do not eat the right amount may become weak and sickly, or overweight and unhealthy. In this section, we will be looking at ways that we can teach about maintaining good health through good nutrition.

In your Teacher Journal, write down what you understand by food nutrients and list some examples of food nutrients that you know

Think

1. Have you ever heard of nutritional diseases such as kwashiorkor, scurvy, pellagra and rickets? What causes them (find out if you don't know)?
2. How does the body take out the nutrients from the food that we eat?

Watch the video clip 11.3 and as you watch the clip, think about the following questions. You may also write your answers in your Teacher Journal.

1. Which of the following materials did the teacher use as teaching aids for the lesson in the clip? Circle the correct ones.

   - Flash cards
   - Picture/charts
   - Pupils
   - Real objects

2. List the six types of nutrients that were mentioned during the lesson.
3. How did the teacher capture pupils' attention during (a) the introduction of the lesson? (b) during the last part of the lesson?

Reflect

Based on the video clip you watched, complete the following tasks. Use your Teacher Journal to write down your answers.

1. Draw lines to match the following food items to their correct food/nutrient groups.

S/N	Food Item	Food/Nutrient group
1.	Fish	Fats and oils
2.	Carrot	Mineral
3.	Potatoes	Vitamins
4.	Palm fruit	Protein
5.	Table salt	Carbohydrates

2. Suggest ways to teach the same topic other than the method used by the teacher in the clip.

Work with your partner in school

1. What diseases can be caused when we do not have a balanced diet?
2. Work out a week's menu of meals that would give you a balanced diet

.

References

Look at the P 5 lesson plans to see more lessons on nutrition.

Section 4:
Diseases

What is a disease? Does every sick person have a disease? A simple definition of a disease is any abnormal condition that affects the structure or function of any of the parts of a living thing. Usually, but not always, a disease will produce observable symptoms.

Diseases have causes. Can we think of anything that can cause a disease? Bacteria or viruses cause some diseases. When some reproduce in the body they affect its normal structure and function. There may be signs and symptoms such as vomiting, diarrhea, high fever, swelling, rashes, back pain, headache, etc. We feel ill. Some diseases are called communicable diseases. This means that the disease can be passed on to others, perhaps by sneezing or by touching. When a disease cannot be easily transferred to another person through contact or closeness, then we say the disease is non-communicable.

Think

1. Can you think of one communicable and one non-communicable disease?
2. Do you know the difference between sickness and disease?

Watch the video clip 11.4 and as you watch the clip, think about the following questions. Fill in the gaps with words from the video you have watched.

1. Two diseases mentioned in the video were ---------- and ----------
2. The teacher told the pupils that diseases were caused by .
3. Disease enters our body through ---------- and ----------

4. One symptom for malaria is ----------

5. Based on the video clip, answer true or false to the following statements. Use your Teacher Journal to write down your answers.

   - The teacher displayed a poster/chart showing some of the diseases that are common to us (True/False).
   - Pupils were encouraged to work in groups (True/False).
   - The teacher asked the pupils to identify the common symptoms associated with some diseases (True/False).
   - Two signs of typhoid are fever and vomiting (True/False).

Reflect

1. Work with your partner to develop three pupil activities which will help pupils to improve the health of their family.

Work with your partner in school

1. Plan to invite a health worker in your community to talk to pupils about the common diseases in your local community.
2. Apart from the method used by the teacher in the video, how else would you teach this lesson to your pupils?

References

Look at your P 5 lesson plans to see more lessons on diseases.

Section 5:
Personal and Environmental Health

Do you know that our home environment has a very big impact on our health? Our personal actions in our environment determine how healthy or unhealthy we will be. We can control the quality of our health to a large extent by controlling the quality of our environment. For instance, people living in a home that is always kept clean are less likely to contract diseases than those who live in a dirty home. It is important to have good personal hygiene habits such as washing our hands before and after eating, washing our hands after using the toilet, covering our food, drinking clean water, cleaning our environment regularly, getting rid of stagnant water around us, getting rid of pests and rodents, etc. There are poor household practices which can negatively affect our personal and environmental health. Think about some of such practices and write down five in your Teacher Journal.

Think

1. In what ways do you think other people's actions can negatively affect your personal health?
2. What are the things you do in your home to ensure good health for you and those around you?

Watch the video clip 11.5 and as you watch the clip, think about the following questions. You may also write your answers in your Teacher Journal.

1. Write two things that were on the board that can contribute to our personal health.
2. What science process skills did the activities in the lesson help the pupils to develop?
3. Write down the difference between personal health and environmental health?
4. How did the teacher ensure that every member of the class participated in the lesson ?
5. How would you make this lesson more active for the pupils?

Reflect

Based on the video clip you watched, complete the following sentences. Use your Teacher Journal to write down your answers.

1. Personal and environmental health means
2. If the air we breathe, the water we drink, the food and the meat we eat and the surroundings we live in are polluted, we will eventually become----------
3. Poor personal hygiene promotes, while good personal hygiene promotes

Work with your partner in school

1. Plan a guided tour of your local community to show areas of the environment that promote a) good health; b) poor health.
2. How will a trip like this help pupils to learn about environmental health? What are the difficulties of organising a trip like this? How will you overcome them?
3. How will you ensure that the pupil's work out what positive steps are being taken to make their environment healthy?

References

Look at P6 lesson plans for more lessons on personal and environmental health.

Section 6:
Use of Medicines

Have you ever wondered if there is a difference between a drug and a medicine? A common misconception is that drugs are bad and medicines are good. However, a drug is anything that we take that causes changes in our bodies. Medicines are drugs because they cause positive changes in our bodies if taken correctly. They can reduce the harm caused by injury, illness and disease. In this section, we will focus on medicines and their uses.

In your Teacher Journal, jot down a list of five common medicines that you know.

Think

1. What might happen if someone takes too much of a drug, including a medicine?
2. Why do you think it is important for doctors to prescribe medicines rather than just buying them from a store or the internet?

Watch the video clip 11.6 and as you watch the clip, think about the following questions. Fill in the gaps with words from the video you have watched.

1. Medicines can be in liquid or ---------- form.
2. Medicines can be bought from a ----------?
3. Panadol is a type of ----------
4. ---------- or ---------- are people that can prescribe medicines.

Reflect

Based on the video clip you watched; answer true or false to the following statements. Use your Teacher Journal to write down your answers.

1. Vitamin C is a nutrient, not a medicine.
2. I should buy additional medicines if the ones given by the doctor are not working or if I want faster relief from pain.
3. Only a doctor or nurse should prescribe medicine.
4. I can use a medicine for as long as I like.
5. Medicine helps make me feel better when I am sick.

Work with your partner in school

1. Plan a role play to demonstrate the harmful effects of drug abuse on an individual. How would you adapt this to use with pupils in your class?

References

Look at P6 lesson plans to see more lessons on uses of medicine.

Summary of the Module

The aim of teaching Health Education in schools is to make pupils aware of the importance of personal and environmental health, for them and for their local communities. Children can influence the adults around them. If they are taught good health practices, they can transfer that knowledge to other members of their communities. In this module, we saw how to teach about the need to be careful and to avoid doing things that can cause injury. Also, no matter how careful we are, accidents may occur. This is why first aid is important and why it is necessary for us to have a first aid box in our homes and schools.

To improve their health, our pupils also need good nutrition by eating a balanced diet. Finally, they can learn about medicines, their good and bad uses as well as the dangers of abusing or misusing them. The various sections in this module have shown how to get pupils involved in the teaching and learning of health education topics in the classroom. Using the ideas from this module will help to make your teaching more interactive.

Experiencing change in your classroom

In your Teacher Journal, write about your experiences of trying out some of the suggested activities from this module in your classroom. To guide your writing, think about.

1. Which activities did you try out when teaching the lessons from this module?
2. Which ones went well? Why?
3. What will you change when you do the same activities next time?

Suggestions for the next cluster meeting

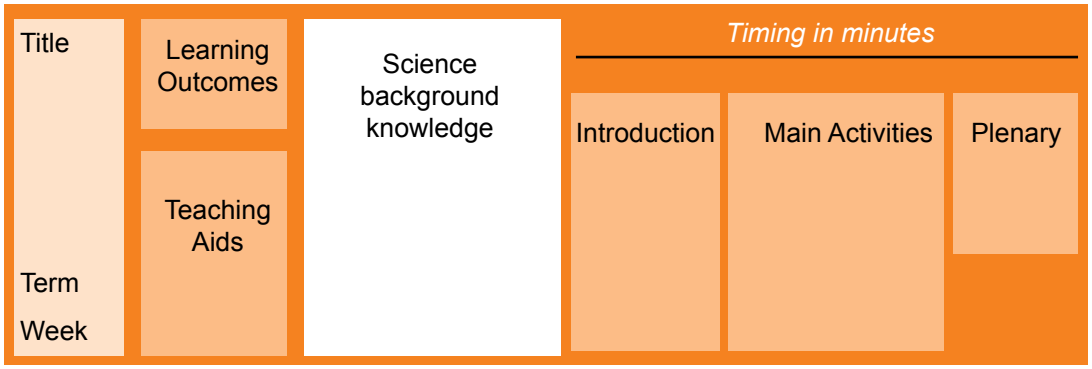
Think of some areas that you wish to discuss in your next Cluster Meeting with your partners or the Teacher Facilitators. This might include challenges which you encountered during your lessons or topics that you found difficulty in creating class activities for.

Annex 1:

Lesson plan and everyday materials for teaching Science and Technology

The Science and Technology Lesson PlanS

Look at the very important lesson plans! Each one has the same 2-page structure.



Title: The theme of several lessons and the subject of this one.

Term and **Week:** Where this lesson fits with other Science lessons. The lesson plan topics are not exhaustive and may not follow your normal sequence of lessons.

Learning Outcomes: What we want learners to know or be able to do by the end of each lesson.

Teaching Aids: Materials used in the lesson. They are prepared before the lesson starts.

Background knowledge: What the teacher needs to know before the lesson.

Introduction: What the lesson is about and finding out what the children know and think already.

Main Activities: The steps that the teacher takes during the lesson to help the learners achieve the learning outcomes.

Plenary: Summarising and finding out if the learning outcomes have been achieved**.**

Everyday materials for teaching science and technology

Science and technology is about activities and experiments. There are low-cost or no-cost materials, available in and around home that you can use to make your lessons active and fun for the learners.

Science equipment for professional laboratories is expensive. However low-cost materials are just as useful for Primary School Science discoveries. Much is available locally for little cost. Pupils can also be asked to bring in clean materials, such as plastic bottles, empty tins, bottle tops, wood, used bulbs, etc.

Other low-cost teaching materials can be found at school, in homes, in the community or its surroundings**.** Many household materials that we throw away are very useful for science and technology lessons.

Everyday Materials for Science and Technology Lessons

Item	Most important Properties	Possible uses	Notes
Tins	Can be used as containers.	Sink and float activities, weighing exercises, seed planting.	Milk tins are useful and found in many places.
Glass bottles and jars	Can be used as containers.	Use like tins. Especially useful where it is necessary to see inside e.g. burning candle in a closed space.	It is useful to have different kinds. Your collection should include bottles with narrow mouth, and jars with wide mouth.
Bottle caps, buttons,	Small and loose.	For counting, weighing, sink and float activities, heating pans.	Particularly useful and very easy to get.
Seeds	Small and loose.	For counting and estimation activities, for growing plants.	'Bean' seeds, groundnuts, maize and millet are all useful.
Matches (used if possible)	All Identical. Long and thin. Made of wood.	For counting, making patterns, as a unit of length.	Need to be careful if using live matches, so pupils don't burn themselves.
Match boxes	'Cuboid' in shape. A small container have a drawer and a cover.	Can be used as containers for concealing small objects, in construction play or to measure. They have long, medium and short sides.	It is useful to have boxes of different sizes.

Item	Most important Properties	Possible uses	Notes
Nylon (polythene) bags	Flexible, transparent, holds water and is air-tight.	Used as containers where flexibility and reasonable strength is required, e.g. solid/ liquid/gas, and for air pressure experiments.	A good nylon bag is very important for air-tight activities. Do NOT let children put plastic bags on face.
Wood	Rigid and solid.	A wide range of uses: can be weighed; can be made into rulers; sinking and floating experiments; an example of a solid.	All shapes and sizes needed. Old scraps of wood can often be obtained from a local carpenter.
Thread	Flexible, thin and strong.	Useful in measuring length.	Thread is often useable instead of string.
Plastic water bottles	Transparent, light and can be used as containers.	Useful for beakers, measuring cylinders, funnels, watering cans, etc.	They are readily available in the local community.
Straws	Transparent, thin and long.	Useful for making towers, shapes and bundles of 10,100 etc.	They can be cut into different lengths and joined to make connections.
Balloons	Elastic, flexible, holds water and is air-tight.	Useful for activities in air pressure, human lungs, gravity, etc.	Low-cost.
Cardboard & papers	Thin, light, flat and flexible	Useful for making charts, and demonstrating the effects of air pressure and shape construction.	Low-cost.

Item	Most important Properties	Possible uses	Notes
Candles	Provides heat and light	Useful for producing heat during experiments, for demonstrating that fire needs oxygen to burn.	Low-cost materials and easily available. Requires safety guidance by teacher during use.
Rubber bands	Elastic and thin.	Useful for activities demonstrating the effects of force.	Low-cost.
Batteries	Have positive and negative terminals. Portable and have long life.	Can be used for activities in energy conversion, and electric current.	Low-cost. Requires safety guidance by teacher during use.
Nails/pins	They are metallic materials. They rust and have sharp tips.	Useful for activities in push and pull, magnetic force and joining materials together. Can be used to teach 'rust'.	Can be locally sourced from the local carpenter's workshop and community at no cost. Requires safety guidance by teacher during use.
Magnets	Attracts certain materials.	Useful for teaching magnetic force.	Can be locally sourced from condemned speakers and bicycle headlamps.
Rope	Flexible, strong and thick.	Can be used for activities to demonstrate pull (e.g. tug-of-war), and for joining objects (such as sticks) together in construction activities.	The kind of rope to be used depends on the activity. Ropes can also be locally sourced at very low or cost.

Please refer to Module 2 of your Teacher's Guide Part A on General Pedagogy for more activities on sourcing for and using low/no cost teaching aids in your science and technology lessons.

Annex 2: Scientific Terms and Meaning

Annex 2:

Scientific Terms	Meaning
Accident	Unexpected happening that can cause injury or harm
Air Pressure	Force exerted by air on an area
Axis	Alignment
Bleeding	Loss of blood from the body as a result of an injury
Canine	“Pointed” teeth, used for tearing.
Communicable disease	A disease that can be transferred through contact with another person.
Component	Small parts built into the computer hardware.
Data	Information that is input to a computer is generally referred to as data.
Disease	A disorder of a structure or function in the body that causes illness.
Disinfect	Removing germs, often with a chemical.
Drug Abuse	Misuse of a harmful substance.
Electrical energy	Energy from the flow of electric charge.
Emergency	A dangerous situation that requires immediate attention.
Energy	The ability of a body or system to do work. Erosion Wearing away of the top soil.
First aid box	A box to keep basic medical materials in.
Gadgets	Electronic gadgets are used in information technology. Examples are smart-phones, tablets etc.
Germs	Small organisms, too small to be seen with our eyes, that cause sickness
Hardware	The physical parts of a computer. Examples include the keyboard, monitor, central processing unit etc.
Heat	Heat is a form of energy that is transferred between two substances due to difference in temperature.
Hygiene	Keeping clean to reduce the number of germs.
Incisors	The front teeth that are used for biting.
Infection	Invasion of the body by germs which multiply to cause illness.

Injury	To receive a wound on any part of the body
Input	Information or data that is received by a computer for processing. Input can be typed or downloaded etc.
Instruments	A tool or device that requires knowledge to use.
Kwashiorkor	A malnutrition disease caused by severe protein and vitamin deficiency.
Light energy	Electromagnetic energy that is visible to the eyes.
Medicines	A substance that has a positive effect on the body.
Minerals	A substance that is needed for the body to work properly.
Mixture	Combination of substances.
Molars	The teeth at the back of your mouth with bigger, flatter chewing surfaces than premolars.
Motor Vehicles	A vehicle that has an engine (e.g. Motorcycle, Car, Lorry)
Non-communicable disease	A disease that is not transferrable through touching an infected person
Nutrients	Substances that our body must get from food
Output	Output is anything that you view on the computer monitor.
Pellagra	A disease caused by a deficiency of niacin in the diet.
Permanent (change)	A change that is stable and will last.
Premolars	Transitional teeth located between the canine and molar teeth. In humans, there are two premolars. They are used for holding or grasping food.
Prescription	A recommendation for medicine, written by a doctor.
Process	A series of operations performed on a set of data.
Program	Common software in the computer that performs a special function or task. The program is a step-by-step set of directions or instructions that has been stored in its memory. An example is the Microsoft Word.
Safety	A state where there is no likelihood of harm.
Scurvy	A disease marked by swollen and bleeding gums and deterioration of skin.
Shape construction	The making of different shapes such as cylinder,cone, etc. using paper, wood or metal.
Software	A set of instructions for a computer to perform specific tasks

Scientific Terms	Meaning
Solar energy	Energy from the sun, made up largely of heat and light.
Spherical	Circular.
System	A collection of components that are organized to perform a task.
System Unit	The collection of electronic components in a computer that process data. It is commonly called the Central Processing Unit (CPU)
Technology	A purposeful human activity that involves designing and making a product to solve a problem.
Temperature	A measure of the degree of heat of a substance.
Temporary state	A change that is short-term or reversible.
Thermometer	An instrument or tool that is used to measure temperature.
Uninterruptible	A power supply that will not fail because the main electrical supply is backed up by a battery. This helps to keep a computer running so that the person can save work and properly shut the computer down.
Vehicle	A moving machine that can be used to transport people or goods on land.

Annex 3:
Sample Answers

Annex 3

Sample Answers

Module 7: Science Process Skills

Section 2: Communicating

Think

Correctly matched activities and communication types.

Drawing	illustrating an event
Writing	noting what you see
Discussion	giving an opinion
Drama	acting out an event
Pictures	looking at images

Photographs of objects classified into soft or hard objects.

Part of a plant	Not part of a plant
Apple	Pillow
	Balloon
Leaf	Bag
	Cup

Section 3: Classifying

Look

a. Classification can only happen after gathering of information or objects. **True**

b. Classification is one of the basic science skills. **True**

c. Classification cannot be done in the class. **False**

d. Classification can be according to colour or size. **True**

e. Classification cannot be done in a science lesson. **False**

Section 3: Measuring

Look

Items (questions)	What to use (answers)
Height of a small plant	Ruler
The temperature of hot water	Thermometer
The amount of sugar that is in a cake recipe	Weighing balance
The amount of rainfall in a month	Measuring cylinder

Section 5: Inferring

The correct order is: 1, 3, 4 and 2

Module 8: Basic Science

Section 1: Temporary and permanent changes

Watch

Q: Put a circle around one of the science process skills you saw in the video

A: Observation

Q: What are the activities the children were asked to do in the clip?

A:
i. Teacher asked the pupils to separate the stones from the sand to show that the change was temporary.
ii. The teacher asked two pupils to switch positions between her left and right sides to show temporary change.
iii. Teacher asked pupils to mix water with sand.

Q: Can you spot the mistakes that the teacher made when identifying permanent and temporary changes?

A:
i. Sand mixes with water and this is a temporary change. They can the pupils to separate the stones from the sand to Be easily separated by filtering.
ii. When the wax of the candle burns, this is a permanent change teacher asked two pupils to switch positions between her left. It is only the melting of the wax that is temporary.
iii. The teacher gave the answers to her questions before the children had time to think.

Reflect

Q: Between the use of simple classroom demonstrations and lecture methods which do you consider as the most appropriate for teaching temporary and permanent changes? Give reasons for your answers

A: Simple classroom demonstrations are more appropriate for science lessons because they help pupils to develop skill of scientific enquiry which is needed for creativity and discovery. They are also more fun.

Q: Suggest some other teaching materials that can be used to teach temporary and permanent changes, apart from the ones used in the clip.

A: Seed germination: Pupils can plant a bean seed inside a small cup with damp soil in it. In two days the seed should germinate showing a change which is permanent. Ice changing back to water can also be used to show temporary change.

Section 2: Human Body (the teeth)

Watch

Answer True or False to the following Statements:

Q: The teacher made good use of the teaching aids to show pupils the different types of teeth. **True**

Q: The pupil in the video tore the meat with her canine teeth. **True**

Q: The teacher allowed individual pupils to locate the positions of the different types of teeth themselves**. False**

Q: The teacher wrote “incisors” next to “apple” on the board. **True**

Reflect

Q: How will you encourage pupils’ participation in larger classes?

A: Options B and C

Section 3: Wind erosion its dangers and control measures

Watch

Q: What was responsible for the movement of the soil in the video clip?

A: The air blown onto it by the pupils using the hand fan.

Q: What conclusions can you make about why the soil moved?

A: The air moves the light particles of soil. It cannot move heavy particles.

Q: How do farmers reduce or prevent the displacement of top soil by wind in our environment?

A: They plant cover crops, grasses and trees. The roots bind the soil particles together into heavy clumps.

Reflect

Q: Match the materials to the right purpose

Materials in the model	**Represents**
Sand	to represent normal soil
Branches and stones	plants that stop soil erosion
Cardboard	the wind
Paper	the hard ground underneath

Q: What other simple activities can you use to teach soil erosion?

A: You can plan a guided tour for pupils to visit a place in the local community that has been affected by erosion.

Q: List other factors that can cause erosion?

A: Human activities, grazing of animals, floods and continuous rainfall.

Section 4: the earth and its movement (rotation and revolution)

Watch Circle the correct answer.

Q: The teacher used the following materials in her model

A: Globe and torch light

Q: The earth's movements are known as:

A: Revolution and rotation

Q: What did the girl in the video do with the globe:

A: Rotated the globe (the wrong way!)

Q: When the light shines on the earth those countries have their

A: Daytime

Q: What class room management method did the teacher use in the video?

A: Whole class demonstration.

Q: How could she have involved all the pupils in the activity? What factors will she need to take into consideration to try this?

A: She could have used group work. She would need to have thought out her equipment needs.

Q: The teacher pointed to the right of the globe and said East. Why would this confuse her pupils?

A: They are looking at the other side of the globe. To them, East is on their right.

Q: Did you spot the mistake that the girl made when rotating the globe?

A: See above.

Reflect:

Q: Write true or false in front of the following statements:

1. The earth rotates on its axis. **True**
2. Revolution and rotation. **True**
3. Revolution is quicker. **False**
4. 365 days. **False**
5. The earth's orbit is a perfect circle. **False**

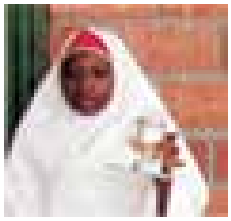
Q: What other teaching aids can you use to teach rotation and revolution of the earth?

A: Calabash (in place of a ball/globe) and a lantern/candle (in place of torch light).

Section 5: Air Pressure

Watch

Q: Re-order the following photographs according to the order in which the activities happened in the video clip. Please also describe the actions happening in each picture.

	Teacher asked pupils to fill the glass up with water.
	Teacher asked pupil to cover the filled glass with a piece of cardboard paper.
	Teacher asked pupil to gently press the cardboard paper onto the glass cup to prevent any air from entering the glass.
	Teacher asked pupil to gently turn the glass up-side-down while still pressing the cardboard onto the glass cup.
	Teacher asked pupil to remove hand gently from the cardboard paper covering the cup and hold the glass so that other pupils can see how air pressure presses on the cardboard.

Module 9: Basic Technology

Section 1: Shape Construction

Watch (video clip 9.1)

Q. How did the teacher engage the pupils during the lesson?

A: By giving pupils activities to do and also asking them questions about the activities.

Q: Identify and classify the materials used for the lesson activity using the table below.

Low cost materials	No cost materials
Cardboard paper	Empty tomato tins
Scissors	
Sellotape	

Reflect

Q. Complete the table below (the first one is already done for you as an example:

Material	Method	Shape
Paper	Folding	Cone, cube, cuboid
Clay	Moulding	Any type of shape
Straw	Bending	Cube, cuboid, pyramid
Metal	Bending	Any type of shape

Section 2: Sources of Energy

Watch (video clip 9.2.)

Q. How did the teacher introduce the lesson?

A: By asking pupils relevant questions based on their daily life experiences.

Q. How could she have involved the pupils more?

A: She could have designed practical investigations and experiments for pupils to complete.

Q. State an activity in the video clip that involved pupils learning from what they experienced.

A: Going out to feel the heat from the sun.

Q. The teacher describes heat and light (of the candle and the sun) as the same thing. What would you say to correct her?

A: Heat and light are different forms of energyn.

Reflect

Q. Write other sources of energy not stated in the video clip.

A: Falling objects, moving objects, springs, batteries.

Source of energy	Type of energy it gives out	Uses of the energy
Sun	light, heat (solar energy)	drying materials, warming water, seeing objects in day light etc.
Kerosene	Light, heat	Heating homes
Batteries	Electrical	Powering small portable machines
Charcoal	Light, heat	Heating homes, cooking.
Electricity	Electrical	Powering large machines

Q. Complete the following table (the first one is already done for you as an example:

Source of energy	Type of energy it gives out	Uses of the energy
Sun	light, heat (solar energy)	Used for drying materials, warming water or body, day light (for seeing things)
Kerosene	Light, heat	Used for cooking, lighting (in kerosene lamp)
Batteries	Electrical	Used for torchlight, radio, clock, etc.
Charcoal	Light, heat	Used for cooking, warming body
Electricity	Electrical	Used for lighting, Ironing clothes, cooking, refrigeration, heating, etc.

Section 3: Parts of Motor Vehicle

Watch (video clip 9.3)

Q: How did the teacher encourage the pupils to participate actively in the lesson?

A: By asking them questions that relate to their daily lives and also by taking the pupils out to see the real object (car) they are learning about.

Q: What teaching materials were used by the teacher?

A: Teacher used a no-cost instructional material found within the school premises.

Q: How did the teacher assess pupils understanding of the topic she taught?

A: Teacher wrote the different parts of a vehicle and their uses on the chalkboard and asked volunteer pupils to come out and match each part of a car with its uses.

Q: Match the following parts with their uses.

Brake	to stop the car
Steering wheel	to change direction
Seat belt	to hold you to your seat
Gear	to change engine speed.

Section 4: Temperature

Watch (video clip 9.4)

Q: How did the teacher make pupils apply the skills of observation and classification?

A: By asking them to report how they felt after they touched some of the instructional materials (observation) then they grouped the various materials into hot, warm and cold (classification).

Module 10: Information Technology

Section 1: Identifying hardware components of a computer and their function

Watch (Video 10.1)

Q: Using the table below list the functions of the major hardware parts of a computer system

A:

S/N	Hard Ware	Function
1.	Monitor	Displays output (information)
2.	Mouse	Assists in the input of data
3.	System Unit (CPU)	Processes data
4.	Keyboard	Inputs data

Section 2: Identification of Information Technology (IT) Gadgets

Watch (Video 10.2)

Q: What IT gadgets did you see in the video?

A: Computer, calculator, camera, mobile phone

Q: Which of IT gadgets will you use to?

A: Take photographs – camera

Write electronic e-mails – computer

Talk or text to another person – phone

Work with numbers – calculator.

Reflect

Q: Circle the IT gadgets (mobile devices) you can identify in the list below:

A:

Computer ( ) Remote control Calculator

Washing machine Electric kettle Tablet

Smartphones ( ) V-sat dish

Q: What other teaching aids can you use to teach this topic apart from the real objects used in the clip?

A: Chart/pictures.

Section 3: Care and Protection of Computer

Watch (Video 10.3)

Q: How did the teacher introduce her lesson?

A: By asking questions

Q: Name 3 things the pupils wrote on the diagram

A: Clean it, cover it, and don't put food on it.

Q: How did the teacher carry out assessment of the work in the video?

A:
- By asking the pupils to feedback
- By asking the pupils to draw
- By copying the work in their exercise books
- Write electronic e-mails – computer
- Talk to another person – phone
- For calculation of numbers – calculator.

Reflect

Q: Mention four ways of protecting a computer

A: a. Plug devices into their proper slots

b. Clean the unit to remove internal dust

c. Avoid putting heavy objects on top

d. Keep liquid away from the computer

Q: Your own opinions provide the answers to the remaining questions.

Section 4: Care and protection of the computer user

Watch

Q: What might happen if you stare very closely at the computer monitor?

A: It can damage your eyes.

Q: How should the cables be arranged?

A: The computer cables should be passed behind the computer and connected to an extension box.

Q: When using the computer, how should the user sit and why?

A: The user should sit on the chair in an upright position to prevent harm to their back.

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