Interesting Science fact #9

A typical microwave oven consumes more electricity powering its digital clock than it does heating food.

NATURAL SCIENCES & TECHNOLOGY

LESSON PLAN
GRADE 4 TERM 3

A MESSAGE FROM THE NECT

NATIONAL EDUCATION COLLABORATION TRUST (NECT)

Dear Teachers,

This learning programme and training is provided by the National Education Collaboration Trust (NECT) on behalf of the Department of Basic Education (DBE)! We hope that this programme provides you with additional skills, methodologies and content knowledge that you can use to teach your learners more effectively.

What is NECT?

In 2012 our government launched the National Development Plan (NDP) as a way to eliminate poverty and reduce inequality by the year 2030. Improving education is an important goal in the NDP which states that 90% of learners will pass Maths, Science and languages with at least 50% by 2030. This is a very ambitious goal for the DBE to achieve on its own, so the NECT was established in 2015 to assist in improving education and to help the DBE reach the NDP goals.

The NECT has successfully brought together groups of relevant people so that we can work collaboratively to improve education. These groups include the teacher unions, businesses, religious groups, trusts, foundations and NGOs.

What are the Learning programmes?

One of the programmes that the NECT implements on behalf of the DBE is the 'District Development Programme'. This programme works directly with district officials, principals, teachers, parents and learners; you are all part of this programme!

The programme began in 2015 with a small group of schools called the Fresh Start Schools (FSS). Curriculum learning programmes were developed for Maths, Science and Language teachers in FSS who received training and support on their implementation. The FSS teachers remain part of the programme, and we encourage them to mentor and share their experience with other teachers.

The FSS helped the DBE trial the NECT learning programmes so that they could be improved and used by many more teachers. NECT has already begun this embedding process.

Everyone using the learning programmes comes from one of these groups; but you are now brought together in the spirit of collaboration that defines the manner in which the NECT works. Teachers with more experience using the learning programmes will deepen their knowledge and understanding, while some teachers will be experiencing the learning programmes for the first time.

Let's work together constructively in the spirit of collaboration so that we can help South Africa eliminate poverty and improve education!

www.nect.org.za

CONTENTS

PROGRAMME ORIENTATION

Welcome to the NECT Natural Sciences & Technology learning programme! This CAPS compliant programme consists of:

- A full set of lesson plans for the term (3 lessons per week)
- A resource pack with images to support the lesson plans
- A full colour poster for one topic
- An outline of the assessment requirements for the term
- A tracker to help you monitor your progress

Lesson Plan Structure

1. The Term 3 lesson plan is structured to run for 9 weeks.
2. Each week, there are three lessons, of the following notional time:

   1 x 1 hour 30 minutes

   2 x 1 hour

   This time allocation of 3.5 hours per week is CAPS aligned.

Lesson Plan Contents

1. The lesson plan starts with a **CONTENTS PAGE** that lists all the topics for the term, together with a breakdown of the lessons for that topic. You will notice that lessons are named by the week and lesson number, for example, Week 8 Lesson 8C.

2. Every topic begins with a 2 - 4 page **TOPIC OVERVIEW**. The topic overview pages are grey, making them easy to identify. The topic overview can be used to introduce the topic to learners. The topic overview includes:

   a. A ***general introduction*** to the topic that states how long the topic runs for, the value of the topic in the final exam and the number of lessons in the topic.

   b. A table showing the ***position of the topic*** in the term.

   c. A ***sequential table*** that shows the prior knowledge required for this topic, the current knowledge and skills that will be covered, and how this topic will be built on in future years. Use this table to give learners an informal quiz to test their prior knowledge. If learners are clearly lacking in the knowledge and skills required, you may need to take a lesson to cover some of the essential content and skills. It is also useful to see what you are preparing learners for next, by closely examining the 'looking forward' column.

   d. A glossary of ***scientific and technological vocabulary***, together with an explanation of each word or phrase. It is a good idea to display these words and their definitions somewhere in the classroom, for the duration of the topic. It is also a good idea to allow learners some time to copy down these words into their personal dictionaries or science exercise books. You must explicitly teach the words and their meanings as and when you encounter these words in the topic. A good way to teach learners new vocabulary is to use 'PATS':

- POINT – if the word is a noun, point at the object or at a picture of the object as you say the word.
- ACT – if the word is a verb, try to act out or gesture to explain the meaning of the word, as you say it.
- TELL – if the word has a more abstract meaning, then tell the learners the meaning of the word. You may need to code switch at this point, but also try to provide a simple English explanation.
- SAY – say the word in a sentence to reinforce the meaning.

e. ***Understanding the uses / value of natural sciences & technology****.* It is very important to give learners a sense of how science applies to their daily lives, and of the value that science adds to their lives. Hold a brief discussion on this point when introducing the topic, and invite learners to elaborate on the uses and value that this topic will have to their lives.

f. ***Personal reflection****.* At the end of every topic, come back to the topic overview, and complete this table. In particular, it is important to note your challenges and ideas for future improvement, so that you can improve your teaching the next year.

3. After the topic overview, you will find the **INDIVIDUAL LESSONS.** Every lesson is structured in exactly the same way. This helps you and the learners to anticipate what is coming next, so that you can focus on the content and skills. Together with the title, each lesson plan includes the following:

a. ***Policy and Outcomes****.* This provides you with the CAPS reference, and an overview of the skills that will be covered in the lesson. You can immediately see the SCIENCE PROCESS AND DESIGN SKILLS that will be covered, and whether they are lower or higher order skills.

b. ***Possible Resources****.* Here, you will see the resources that you should ideally have for the lesson. If you need to use the poster or pages from the resource pack, this will be listed here. There is also a space for improvised resources, and you are invited to add your own ideas here.

c. ***Classroom Management****.* Every lesson starts in the same way. Before the lesson, you must write a question that relates to the previous lesson on the chalkboard. Train your learners to come in to the classroom, to take out their exercise books, and to immediately try to answer this question. This links your lesson to the previous lesson, and it effectively settles your learners.

Once learners have had a few minutes to answer, read the question and discuss the answer. You may want to offer a small reward to the learner who answers first, or best. Get your learners used to this routine.

Next, make sure that you are ready to begin your lesson, have all your resources ready, have notes written up on the chalkboard, and be fully prepared to start. Remember, learners will get restless and misbehave if you do not keep them busy and focussed.

d. ***Accessing Information****.* This section contains the key content that you need to share with learners. Generally, it involves sharing some new information that is written on the chalkboard, explaining this information, and allowing learners some time to copy the information into their exercise books. Train learners to do this quickly and efficiently. Learners must anticipate this part of the lesson, and must have their books, pens, pencils and rulers ready.

Explain to learners that this is an important resource for them, because these are the notes they will revise when preparing for tests and exams.

Checkpoint 1. Straight after 'Accessing Information', you will find two checkpoint questions. These questions help you to check that learners understand the new content thus far.

e. ***Conceptual Development.*** At this point, learners will have to complete an activity to think about and apply their new knowledge, or to learn a new skill. This is the most challenging part of the lesson. Make sure that you fully understand what is required, and give learners clear instructions.

Checkpoint 2. Straight after 'Conceptual Development, you will find two checkpoint questions. These questions help you to check that learners understand the new concepts and skills that they have engaged with.

f. ***Reference Points for Further Development.*** This is a useful table that lists the relevant sections in each approved textbook. You may choose to do a textbook activity with learners in addition to the lesson plan activity, or even in place of the lesson plan activity. You may also want to give learners an additional activity to do for homework.

g. ***Additional Activities / Reading.*** This is the final section of the lesson plan. This section provides you with web links related to the topic. Try to get into the habit of visiting these links as part of your lesson preparation. As a teacher, it is always a good idea to be more informed than your learners.

4. At the end of the week, make sure that you turn to the **TRACKER,** and make note of your progress. This helps you to monitor your pacing and curriculum coverage. If you fall behind, make a plan to catch up.

5. **POSTER AND RESOURCE PACK.** You will have seen that the *Possible Resource* section in the lesson plan will let you know which poster or reference pages you will need to use in a lesson.

   Please note that you will only be given these resources once. It is important for you to manage and store these resources properly. Do this by:

   - Writing your name on all resources
   - Sticking Resource onto cardboard or paper
   - Laminating all resources, or covering them in contact paper
   - Filing the resource papers in plastic sleeves once you have completed a topic

   Have a dedicated wall or notice board in your classroom for Natural Science and Technology.

   - Use this space to display the resources for the topic
   - Display the vocabulary words and meaning here, as well as the resources
   - Try to make this an attractive and interesting space
   - Display learners' work on this wall – this gives learners a sense of ownership and pride

6. **ASSESSMENT.** At the end of the lesson plans, you will find the CAPS assessment requirements for the term. You should refer to your prescribed textbooks and departmental resources for examples of the relevant assessments.

Lesson Plan Routine

Train your learners to know and anticipate the routine of Natural Science and Technology lessons. You will soon see that a good knowledge of this routine will improve time-on-task and general classroom discipline and that you will manage to work at a quicker pace.

Remember, every Natural Science and Technology lesson follows this routine:

1. **Classroom Management**: settle learners by having two questions written on the chalkboard. Learners take out their exercise books and pens, and immediately answer the questions. Discuss the answers to the questions, and reward the successful learner.
2. **Accessing Information:** have key information written on the chalkboard. Explain this to learners. Allow learners to copy this information into their books.
3. **Checkpoint 1:** ask learners two questions to check their understanding.
4. **Conceptual Development:** complete an activity to apply new knowledge or skills.
5. **Checkpoint 2:** ask learners two questions to check their understanding.
6. **Reference Points for Further Development:** links to textbook activities – you may choose to use these activities as additional classwork activities, or as homework activities.
7. **Tracker:** fill in your tracker at the end of the week to track your progress.

PROGRAMME ORIENTATION

A vehicle to implement CAPS

Teaching Natural Sciences & Technology can be exciting and rewarding. These lesson plans have been designed to guide you to implement the CAPS policy in a way that makes the teaching and learning experience rewarding for both the teacher and the learners.

To support the policy's fundamentals of teaching Natural Sciences & Technology, these lesson plans use the CAPS content as a basis and:

- provide a variety of teaching techniques and approaches
- promote enjoyment and curiosity
- highlight the relationship between Natural Science and Technology and other subjects
- where appropriate, draw on and emphasise cultural contexts and indigenous knowledge systems
- show the relationship between science, learners, their societies and their environments
- aim to prepare learners for economic activity and self-expression

Content and Time Allocation

These lessons plans have been developed to comply with CAPS in respect of both content and time allocation. In developing these lesson plans, we took into consideration the realities of teachers and to this end, we made some simple adjustments, without deviating from policy, to make the teaching of these lesson plans more achievable. The kinds of adjustments made include using some of the practical tasks in the lesson plans for assessment purposes; and building in time for revision and exams during terms 2 and 4.

CAPS assigns one knowledge strand to form the basis of content in each term. These strands are as follows:

- Term 1: ***Life and Living***
- Term 2: ***Matter and Materials***
- Term 3: ***Energy and Change***
- Term 4: ***Planet Earth and Beyond***

In most terms, there are Technology knowledge strands that complement the Natural Sciences strands. There are three Technology strands, they are:

- ***Structures***
- ***Systems and Control***
- ***Processing***

The distribution of these strands across the year is summarised in the table below:

Grade 4							
Term 1		**Term 2**		**Term 3**		**Term 4**	
Strands NS & Tech		**Strands NS & Tech**		**Strands NS & Tech**		**Strands NS & Tech**	
Life and Living	**Structures**	**Matter and Materials**	**Structures**	**Energy and Change**	**Systems and Control**	**Planet Earth and Beyond**	**Systems and Control**
Living and non-living things Structures of plants and animals What plants need to grow Habitats of animals	Structures for animal shelters	Materials around us Solid materials	Strengthening materials Strong frame structures	Energy and Energy transfer Energy around us Energy and sound	Movement energy in a system	Planet Earth The Sun The Earth & the Sun The Moon	Rocket Systems
These lesson plans have been designed against the stipulated CAPS requirements with topics being allocated for the time prescribed by CAPS. (Remember that some slight changes have been incorporated to accommodate time for revision, tests and examinations).							

PROGRAMME ORIENTATION

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The time allocation by topic is summarised in the table below.

Remember that one week equates to 3,5 hours or three lessons: two lessons of 1 hour each; and one lesson of 1½ hours.

	GRADE 4		GRADE 5		GRADE 6	
TERM	**Topic**	**Time in weeks**	**Topic**	**Time in weeks**	**Topic**	**Time in weeks**
Term 1: Life and Living	• Living and non-living things • Structures of plants and animals • What plants need to grow • Habitats of animals • Structures for animal shelters	2 2½ 1 1 2½ (10 wks)	• Plants and animals on Earth • Animal Skeletons • Food Chains • Life cycles • Skeletons and Structures	2½ 1½ 2½ 1½ 2 (10 wks)	• Photosynthesis • Nutrients in Food • Nutrition • Food Processing • Eco Systems and food webs	2½ 1½ 1½ 2½ 2 (10 wks)
Term 2: Matter and Materials	• Materials around us • Solid materials • Strengthening materials • Strong frame structures	3½ 2 2 2½ (10 wks)	• Metals and non-metals • Uses of metals • Processing materials • Processed materials	2 2½ 3½ 2 (10 wks)	• Solids, liquids and gases • Mixtures • Solutions as special mixtures • Dissolving • Mixtures and water resources • Processes to purify water	½ 1 2½ 1 2½ 2½ (10 wks)

Term 3: Energy and Change	• Energy and Energy transfer • Energy around us • Movement energy in a system • Energy and sound	2½ 2½ 2½ 2½ (10 wks)	• Stored energy in fuels • Energy and electricity • Energy and movement • Systems for moving things	3 3 1 3 (10 wks)	• Electric circuits • Electrical conductors and insulators • Systems to solve problems • Mains electricity	2½ 2 2½ 3 (10 wks)
Term 4: Planet Earth and Beyond	• Planet Earth • The Sun • The Earth & the Sun • The Moon • Rocket Systems	2 1 1 2 2 (8 wks)	• Planet Earth • Surface of the Earth • Sedimentary Rocks • Fossils	1 2½ 2 2½ (8 wks)	• The solar system • Movements of the earth and planets • The movement of the Moon • Systems looking into space • Systems to explore the Moon and Mars	2½ 1 1 1 2½ (8 wks)
TOTALS	38 weeks		38 weeks		38 weeks	

REFLECTING ON THE LESSONS THAT YOU TEACH

It is important to reflect on your teaching. Through reflection, we become aware of what is working and what is not, what we need to change and what we do not. Reflecting on your use of these lesson plans will also help you use them more effectively and efficiently.

These lesson plans have been designed to help you deliver the content and skills associated with CAPS. For this reason, it is very important that you stick to the format and flow of the lessons. CAPS requires a lot of content and skills to be covered – this makes preparation and following the lesson structure very important.

Use the tool below to help you reflect on the lessons that you teach. You do not need to use this for every lesson that you each – but it is a good idea to use it a few times when you start to use these lessons. This way, you can make sure that you are on track and that you and your learners are getting the most out of the lessons.

LESSON REFLECTION TOOL			
Preparation			
1.	What preparation was done?		
2.	Was preparation sufficient?		
3.	What could have been done better?		
4.	Were all of the necessary resources available?		
Classroom Management			
		Yes	**No**
5.	Was there a question written in the board?		
6.	Was there an answer written on the board?		
7.	Was the answer discussed with the learners in a meaningful way?		
8.	Overall reflection on this part of the lesson: What was done well? What could have been done better?		

Accessing Information			
		Yes	**No**
9.	Was the text and/ or diagrams written on the chalkboard before the lesson started?		
10.	Was the work on the board neat and easy for the learners to read?		
11.	Was the explanation on the content easy to follow?		
12.	Was the information on the board used effectively to help with the explanations?		
13.	Was any new vocabulary taught effectively? (in context and using strategies like PATS)		
14.	Were the learners actively engaged? (asked questions, asked for their opinions and to give ideas or suggestions)		
15.	Were the checklist questions used effectively?		
16.	Overall reflection on this part of the lesson: What was done well? What could have been done better?		

PROGRAMME ORIENTATION

Conceptual Development			
		Yes	**No**
17.	Was the information taught in the 'Accessing Information' part of the lesson used to foreground the activity?		
18.	Were clear instructions given for the conceptual development activity?		
19.	Were the outcomes/answers to the activities explained to the learners?		
20.	Could the learners ask questions and were explanations given?		
21.	Was a model answer supplied to the learners? (written or drawn on the board)		
21.	Were the checklist questions used effectively?		
22.	At the end of the lesson, were the learners asked if they had questions or if they needed any explanations?		
23.	Overall reflection on this part of the lesson: What was done well? What could have been done better?		

TOPIC OVERVIEW:

Energy and change & Systems & control

Term 3, Weeks 1A – 2B

A. TOPIC OVERVIEW

TERM 3, WEEKS 1A – 2B

- This topic runs for 1½ weeks.
- It is presented over 5 lessons.
- This topic counts for 20% in the end-of-year exam.
- This topic's position in the term is as follows:

LESSON	WEEK 1			WEEK 2			WEEK 3			WEEK 4			WEEK 5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

LESSON	WEEK 6			WEEK 7			WEEK 8			WEEK 9			WEEK 10		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

B. SEQUENTIAL TABLE

GRADE 1 & 3	GRADE 4	GRADE 5
LOOKING BACK	**CURRENT**	**LOOKING FORWARD**
• What we need to live • Different types of food – for growth, energy, health • Water • Air • Sunlight	• Energy for life • We use energy for everything we do • We get our energy from food • Energy in our food comes from the Sun (plants use the energy from the Sun to make food for themselves and for animals and people) • Energy from the Sun • Energy is transferred from the Sun to plants, and to animals in a sequence known as an energy chain • Food chains • Energy	• Food chains • Green plants make their own food and build their branches and stems using water and carbon dioxide from the air, and energy from Sunlight. • Animals need food to carry out their life processes • All animals depend on plants as their primary source of food • A food chain describes the feeding relationship between plants and animals

	• We are aware of energy around us, including movement, heat, light, sound	

C. SCIENTIFIC AND TECHNOLOGICAL VOCABULARY

Ensure that you teach the following vocabulary at the appropriate place in the topic:

	TERM	EXPLANATION
1.	energy	A fuel that makes things happen, move or change
2.	source	A place where we get something from
3.	muscles	Tissues in the body which help people to move around by stretching and contracting
4.	glucose	A sugar substance found in plants as a food
5.	food chain	A chain from the original energy source to the final consumer
6.	herbivores	Animals that eat only plants
7.	carnivores	Animals that eat meat
8.	omnivores	Animals that eat both plants and animals
9.	diagram	A drawing or a plan that outlines or explains something
10.	food web	A number of food chains linked together
11.	habitat(s)	A place which is the natural home of certain animals

D. UNDERSTANDING THE USES / VALUE OF NATURAL SCIENCES & TECHNOLOGY

It is important to know that every living thing on earth needs energy. There is a value to knowing that people need energy to grow, play, work and sleep. There is a value to understanding how people receive the energy that they require to live.

E. PERSONAL REFLECTION

Reflect on your teaching at the end of each topic:

Date completed:	
Lesson successes:	
Lesson challenges:	
Notes for future improvement:	

1 A

Term 3, Week 1, Lesson A
Lesson Title: Energy for life
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy and energy transfer
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain why energy is so important to people
- identify the importance of energy in people's bodies.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying	✓	11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information			

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 1.1 and 1.2: Energy for life	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What shape is used most often in construction?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

Triangles are used most often in construction.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

ENERGY FOR LIFE

1. People need to move around a lot.
2. They walk, run, learn and work.
3. We need **energy** for everything that we do.
4. Energy makes things happen, move or change, in form. (movement)
5. All living things need energy to live.

2. Explain this to the learners as follows:
   a. We need to know that every living thing on earth needs energy to do anything. Using Resource 1, show the learners the examples of living things doing activities that require energy.
   b. Ask the learners to give examples of activities they are involved in at school that require energy.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What do people need in order to walk or run?
b. What does energy help all living things to do?

Answers to the checkpoint questions are as follows:

a. People need energy in order to move around.
b. Energy helps all living things to live.

E CONCEPTUAL DEVELOPMENT

1. Explain the following to the learners:

USES OF ENERGY

1. Energy is needed to grow, breathe, and feed.
2. The human body needs energy for different activities every day.
3. Things that help us to live, for example, fridges, stoves, and heaters, also need energy.
4. In Science we say that energy is needed to do work.
5. Work is a word used to describe effort or energy used.

2. Read the information on the board to the learners.
   a. Explain that living things need energy to complete their life processes.
   b. People need energy to do everything that is required of them.
   c. In our homes we have machines that help us to live. These machines need energy, too. Most of these machines need electricity to do the work that is required of them.
   d. Explain to the learners that work is a word used to describe effort or energy used to do something.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the pictures on Resource 1.1 and 1.2, tell the learners to copy these questions down into their book and answer them:

TASK

1. Identify what is happening in each picture?
2. Does eating use energy? How?

5. Give learners some time to complete this task in their exercise books.
6. Model answer

MODEL ANSWER

1. *People are running, eating, and climbing.*
2. *Eating uses energy to chew and to digest food.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Give two examples of things that help people to live?
b. What does 'work' mean in scientific terms?

Answers to the checkpoint questions are as follows:

a. Any two from fridges, stoves, and heaters
b. Work means effort or energy used.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Energy for life	133
Study & Master	Energy for life	95-97
Day by Day	Energy for life	93
Platinum	Energy for life	110
Viva	Energy for life	98-99
Spot On	Energy for life	56
Oxford Successful	Energy for life	76-77
Shuter & Shooter	Energy for life	77-78
Sasol Inzalo Bk B	Energy for life	4-8

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=fjuvatIoSzY (7min 10sec) [Science videos for kids: What is energy?]

1 B

Term 3, Week 1, Lesson B
Lesson Title: Energy from food
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy and energy transfer
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain what a source of energy is
- identify the importance of food as a source of energy in people's bodies.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying	✓	11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information			

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 2 - Energy from food	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What do all living things need to live?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

All living things need energy to live.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

ENERGY FROM FOOD

1. A **source** is a thing or a place from which we get something.
2. A source of energy is a thing or a place from which we get our energy.
3. Food is a source of energy for our body.
4. When you move, your **muscles** use energy.
5. You need to make sure you have energy in your body to make your muscles work effectively.

2. Explain this to the learners as follows:
   a. We need to know that in order to get energy, we need to find a source of energy. A source is a thing or a place from which we get something. Using Resource 2, show the learners the examples of food that provide lots of energy.
   b. Ask the learners to give examples of their food that they feel gives them the most energy to get through their day.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. When people move, what body parts need energy?
b. What is our most common source of energy?

Answers to the checkpoint questions are as follows:

a. People's muscles need energy.
b. Food is our most common source of energy.

E CONCEPTUAL DEVELOPMENT

1. Explain the following to the learners:

ENERGY IN FOOD

1. The energy for your muscles comes from the food you eat.
2. Our food comes from plants and animals.
3. Energy is stored in food.
4. Not all food has the same amount of energy.
5. The food is broken down inside our bodies so that energy can be made and used.
6. When we run out of energy, our muscles get tired, and we need more food.

2. Read the information on the board to the learners.
   a. Explain that in order for our muscles to work properly they need energy. This energy comes from the food we eat. Our food comes from plants and animals.
   b. The food that we eat is broken down inside our stomach so that the energy can be used.
   c. This process is repeated all the time as our bodies need food.
4. Ask the learners if they have any questions. Provide answers where necessary.
5. After looking at the pictures on Resource 2, tell the learners to copy these questions down into their workbooks and answer them:

TASK

1. Is all food full of energy?
2. Where does the food go to in our bodies?
3. Is eating plants the only way to get energy? Explain

5. Give learners some time to complete this task in their exercise books.
6. Model answer

MODEL ANSWER

1. *Food has different amounts of energy.*
2. *The food goes to our stomach after we have swallowed.*
3. *No, people can also get energy from eating animals.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What are two sources of energy?
b. What happens when we run out of energy?

Answers to the checkpoint questions are as follows:

a. Plants and animals
b. If we run out of energy, we need to eat to get more energy.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Energy for life from food	133
Study & Master	Energy from food	97-98
Day by Day	We get our energy from food	94-95
Platinum	We get energy from our food	111
Viva	We get our energy from food	99-100
Spot On	Energy for life	56
Oxford Successful	We get our energy from food	77-78
Shuter & Shooter	How do we get energy?	90
Sasol Inzalo Bk B	Energy for life	4-8

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=SuPxikxEsQI (5min) [How to boost energy naturally]
2. https://www.youtube.com/watch?v=PgDxS3cpuX4 (2min 7sec) [Measuring the energy in food]

1 C

Term 3, Week 1, Lesson C
Lesson Title: Energy in food comes from the Sun
Time for lesson: 1½ hours

A POLICY AND OUTCOMES

Sub-Topic	Energy and energy transfer
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain how energy from the Sun is converted into food in plants
- explain the process of energy moving from the Sun to people.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying	✓	11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 2: Energy from food	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

Where do people get their energy from?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

People get their energy from the food they eat.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

ENERGY IN FOOD COMES FROM THE SUN

1. The source of all energy on earth is the Sun.
2. The Sun provides us with two types of energy – heat and light.
3. Plants make their own food by trapping the light energy from the Sun in their leaves.
4. They use this energy to make **glucose**, which they 'eat'.
5. Glucose is made from water and carbon dioxide.
6. As the plants grow, some energy is stored in the leaves, stems or roots.

2. Explain this to the learners as follows:
   a. We need to know that the Sun provides the earth with heat and light energy.
   b. Plants trap the light energy in their leaves.
   c. The plant uses the energy to make glucose which is the plant's food. This is made from water and carbon dioxide.
   d. Some of this food is stored in the plant for future use.
   e. Using Resource 2, show the learners the examples of food that provide lots of energy.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What is the source of all energy on earth?
b. What does a plant need to make glucose?

Answers to the checkpoint questions are as follows:

a. The Sun
b. A plant needs carbon dioxide and water to make glucose.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

ENERGY PROCESS

1. Grass traps sunlight to make energy so it can grow.
2. A cow eats grass to get energy to make milk.
3. The milk is used to make cheese and yoghurt.
4. Some people will also eat meat from cows.
5. We get all our energy from the food we eat.
6. This energy moves through the living things and into us.

2. Read the information on the board to the learners.
   a. Explain that there is a process by which energy gets to people. Energy comes from the Sun and plants use it to make food. Animals, including cows, eat plants.
   b. Cows use the energy they receive from their food to make milk. Other products are made with this milk.
   c. People then eat the food and receive their energy.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the pictures on Resource 2, tell the learners to copy this question down into their book and answer it:

TASK

1. Describe the process that energy undergoes when it travels from the Sun to reach people.

5. Give learners some time to complete this task in their exercise books.
6. Model answer

MODEL ANSWER

The Sun gives off light and heat energy. This light energy is absorbed by plants and is used to make food for the plants to grow. Animals eat the plants and the energy is transferred to them. People eat the animals or the products of the animals, and the energy moves to them.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What do cows produce that can be turned into cheese?
b. How do cows produce milk?

Answers to the checkpoint questions are as follows:

a. Cows produce milk that can be turned into cheese.
b. Cows use the energy they get from the food they eat in order to produce milk.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Energy from the Sun	134
Study & Master	Energy from the Sun	99-101
Day by Day	Energy in our food comes from the Sun	95
Platinum	Energy in food comes from the Sun	112
Viva	-	-
Spot On	Energy for life	56
Oxford Successful	Energy in our food comes from the Sun	79
Shuter & Shooter	How do we get energy?	90
Sasol Inzalo Bk B	Energy for life	4-8

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=aUa7I7D_myU (2min 2sec) [Where does energy come from?]

2 A

Term 3, Week 2, Lesson A
Lesson Title: Energy from the Sun
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy and energy transfer
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- identify that the process of the movement of energy is called a food chain
- identify the class of animals according to what they eat.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing	✓	9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying	✓	11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 3: Energy from the Sun	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What else do cows give us besides milk?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.Discuss their answers with the learners.
4. Write the model answer onto the chalkboard.

Cows give us meat.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

ENERGY FROM THE SUN

1. The Sun gives us light and heat.
2. Plants change light energy into energy that is stored as food in the plant.
3. Animals get the energy they need by eating plants, or other animals.
4. Energy from the Sun is passed to plants and then to animals.
5. Dead plants and animals provide food for other animals.
6. The transfer of energy happens in a **food chain**: from the Sun to the plant and then to animals.

2. Explain this to the learners as follows:
   a. We need to know that the Sun provides the Earth with heat and light energy.
   b. Plants change light energy into food.
   c. Animals get the energy they need by eating plants or other animals.
   d. There is still energy in dead plants and animals.
   e. The process of energy being transferred is known as a food chain.
   f. Using Resource 3, show the learners the process that energy undergoes from the Sun to people.
7. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. Is there still energy in dead plants and animals?
b. Where does the transfer of energy happen?

Answers to the checkpoint questions are as follows:

a. Yes, there is still energy in dead plants and animals.
b. The transfer of energy happens in a food chain.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

ENERGY CHAIN

1. A food chain is also called an energy chain.
2. It shows the order in which energy passes from the Sun.
3. It goes to plants first and then to the animals that eat the plants.
4. It then goes to other animals which eat animals.
5. Animals that eat plants are called **herbivores**.
6. Animals that eat animals are called **carnivores**.
7. Animals that eat both plants and other animals are called **omnivores**.

2. Read the information on the board to the learners.
   a. Explain that food chains are also called energy chains.
   b. These chains show the order in which energy travels.
   c. There are different names for animals that eat plants only, that eat animals only, and that eat both plants and animals.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the picture on Resource 4, tell the learners to draw two food chains including animals and plants that they know.

TASK

After looking at the picture on Resource 3, tell the learners to draw in their workbooks the process of the transfer of energy from the Sun to plants, through animals and then to people.

5. Give learners some time to complete this task in their exercise books.
6. Model Answer:

MODEL ANSWER

Use the illustration from the Resource to show the process.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What are animals called that eat plants?
b. What are animals called that eat both plants and animals?

Answers to the checkpoint questions are as follows:

a. Animals that eat plants are called herbivores.
b. Animals that eat both plants and animals are called omnivores.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Energy from the Sun	134
Study & Master	Energy from the Sun	99-101
Day by Day	Energy from the Sun	97-99
Platinum	Energy from the Sun	114-115
Viva	Energy from the Sun	100-101
Spot On	Energy from the Sun	57
Oxford Successful	Energy from the Sun	80
Shuter & Shooter	Energy from the Sun	81
Sasol Inzalo Bk B	Energy from the Sun	9-13

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=Q0LBegPWzrg (4min 13sec) [Energy: The Dr Binocs Show]

2 B

Term 3, Week 2, Lesson B
Lesson Title: Food chains
Time for lesson: 1½ hours

A POLICY AND OUTCOMES

Sub-Topic	Energy and energy transfer
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain what food chains are and what they show
- classify plants and animals into different food chains.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting	✓	14. Designing	
3. Comparing	✓	9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying	✓	11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information			

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 4: Food chains	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What are animals called that eat other animals?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

Animals that eat other animals are called carnivores.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

FOOD CHAINS

1. Food chains can be **diagrams** that show how energy flows from the Sun.
2. Food chains show how energy moves through all **habitats**.
3. They show how living plants and animals depend on each other for food.
4. The relationships between animals and plants is important.
5. Certain plants and animals are dependent on certain habitats to keep them alive.

2. Explain this to the learners as follows:
   a. We need to know what a food chain is and how it organises information. Food chains show the path of energy through all habitats.
   b. Food chains show the relationship between plants and the animals that feed off these plants.
   c. Habitats have certain relationships. If one part of the food chain is not there, the chain falls apart. If food for a particular animal is missing, then the animal will need to move to find food in another place.
   d. There is still energy in dead plants and animals.
   e. Using Resource 4, show the learners the examples of food chains.
3. Give learners some time to copy the above information from the chalkboard into their workbooks. Have a classroom discussion.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What do food chains show?
b. What will happen if a certain plant stops existing in a habitat?

Answers to the checkpoint questions are as follows:

a. Food chains show the order that energy moves in a habitat.
b. The animals that rely on these plants will move to places where they can find food.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

PARTS OF A FOOD CHAIN

1. In a food chain diagram, arrows are used to show the direction of the energy.
2. A food chain diagram shows the order in which energy moves from the Sun to a human.
3. A food chain diagram can have pictures or words for each step.
4. Many food chains will combine to make a **food web**.
5. A food web is a number of food chains that are linked by the same animals or plants in the chain.
6. Animals that eat both plants and other animals are called **omnivores**.

2. Read the information on the board to the learners.
   c. Explain that there are certain ways to draw food chains.
   d. Food chains can have pictures or words showing each step.
   e. Two or more food chains can be linked up, where there are common sections, to form food webs.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the picture on Resource 4, tell the learners to draw two food chains including animals and plants that they know.
5. Give learners some time to complete this task in their exercise books.
6. Model Answer:

MODEL ANSWER

Use illustration 2 from the Resource to show the process.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What is a food chain?
b. What do the arrows in the food chain show?

Answers to the checkpoint questions are as follows:

a. A food chain is the flow of energy between plants and animals.
b. Flow of energy.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Energy from the Sun	135
Study & Master	Food chains as energy systems as eco systems	99-100
Day by Day	Food chains	100
Platinum	Energy from the Sun	114-115
Viva	Energy from the Sun	100
Spot On	Looking at food chains	57-59
Oxford Successful	The energy chain or food chain	81-83
Shuter & Shooter	Describing food chains	81-82
Sasol Inzalo Bk B	Energy from the Sun	14-15

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=hLq2datPo5M (4min 57sec) [Food Chains for Kids: Food Webs, the Circle of Life, and the Flow of Energy]
2. https://www.youtube.com/watch?v=MuKs9o1s8h8 (3min 24sec) [Fabulous food chains]

TOPIC OVERVIEW:

Energy around us

Term 3, Weeks 2C – 5A

A. TOPIC OVERVIEW

TERM 3, WEEKS 2C – 5A

- This topic runs for 2½ weeks.
- It is presented over 8 lessons.
- This topic counts for 20% in the end-of-year exam.
- This topic's position in the term is as follows:

LESSON	WEEK 1			WEEK 2			WEEK 3			WEEK 4			WEEK 5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

LESSON	WEEK 6			WEEK 7			WEEK 8			WEEK 9			WEEK 10		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

B. SEQUENTIAL TABLE

GRADE 1 & 3	GRADE 4	GRADE 5
LOOKING BACK	**CURRENT**	**LOOKING FORWARD**
• Pollution • What pollution is • Different types of pollution – water, land, air, noise • Effects of pollution on people	• We are aware of energy around us, including movement, heat, light, and sound • Energy is also stored in sources such as food, wood, coal, oil products, and natural gas • Energy can be transferred from a source to where it is needed • Input and output energy • Machines and appliances need an input of energy to make them work • Machines and appliances provide an output of energy (work) useful to us	• Fuels • Energy is stored in fuels (including food) • We use fuels as sources of useful energy • Everyday fuels that we use include coal, wood, paraffin, gas, and candle wax • When we burn these fuels we get useful output energy, such as heat and light • Burning fuels • Fuels need heat to set them alight, and air (oxygen) to keep on burning • Fires can be a threat in our communities

	• We are aware of energy around us, including movement, heat, light, sound	

C. SCIENTIFIC AND TECHNOLOGICAL VOCABULARY

Ensure that you teach the following vocabulary at the appropriate place in the topic:

	TERM	EXPLANATION
1.	temperature	The measure of the warmth of coldness of an object or a place
2.	hydroelectric	Electricity that is made by the movement of water
3.	decibel(s)	A unit for measuring the loudness of sounds
4.	pollution	The introduction of harmful things into the environment
5.	source	A thing or a place from which we get something
6.	transferred	Moved from one place to another
7.	flow diagram	A diagram that shows a step-by-step process through a procedure
8.	system	A combination of simple parts that form a complicated whole
9.	appliance	A device made for a particular purpose or use

D. UNDERSTANDING THE USES / VALUE OF SCIENCE

It is important to know that every living thing on earth needs energy to move. We need to know where this energy comes from. There is a value in knowing the different forms of energy and how they can be recognised. There is a value in knowing that energy is not lost, but is rather transferred from one form to another.

E. PERSONAL REFLECTION

Reflect on your teaching at the end of each topic:

Date completed:	
Lesson successes:	
Lesson challenges:	
Notes for future improvement:	

2 C

Term 3, Week 1, Lesson C
Lesson Title: Energy around us
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy around us
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain the difference between light and heat energy
- explain how electrical energy is generated.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions	✓	13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 5.1, 5.2 and 5.3: Energy around us	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What do food chains show?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

Food chains show the movement of energy through habitats.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

ENERGY AROUND US

1. Light is energy we can see.
2. The Sun provides light during the day.
3. Stars, light bulbs, candles, paraffin lamps, fire and torches also give out light.
4. Heat is a form of energy we can feel
5. You can feel whether it is hot or cold outside.
6. **Temperature** is a measure of how hot or cold something is – how much heat it has.

2. Explain this to the learners as follows:
   a. We need to know that there are two forms of energy, called light energy and heat energy. As we have learnt already, we get heat and light from the Sun. But there are other sources of heat and light energy. Using Resource 5, show the learners the examples of things that give out heat or light, or both heat and light.
   b. Ask the learners if they can name two things in nature that give out light.
   c. Explain that we can see light energy, and we can feel heat energy, if the source is near us.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What type of energy can we see?
b. What are two everyday objects that give out light?

Answers to the checkpoint questions are as follows:

a. We can see that light is energy.
b. Light bulbs, candles, paraffin lamps, fire, torches – any two

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

LIGHT AND HEAT ENERGY

1. Energy is needed to give out light. Fire burns the fuel it is given.
2. Light bulbs need electrical energy to provide light.
3. Electrical energy comes from burning coal, a wind farm or a power station.
4. Energy sources for heat are: the Sun and things that burn (wood, coal, paraffin, wax).
5. There are many electrical appliances that can be used to provide heat, for example, a stove or a heater.
6. When heat is added to something it becomes warmer. When the heat is removed, the object cools down.

2. Read the information on the board to the learners.
   a. Explain that energy is needed for an object to give out heat or light energy.
   b. Explain that these objects need to get their energy from a source of energy.
   c. Tell the learners that the greater the energy source there is, the longer the object will be able to project light, or the greater the heat will be.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the pictures on Resource 5, tell the learners to copy these questions down into their book and answer them:

TASK

1. Which object is able to give off light and heat, but can be dangerous if not controlled?
2. Why does the paraffin lamp have a glass cover around the flame?
3. Why do you think fire can be dangerous?

5. Give learners some time to complete this task in their exercise books.
6. Model answer

MODEL ANSWER

1. *A candle or a fire.*
2. *It has a glass cover so that the flame is protected.*
3. *Fire can be dangerous because it uses whatever fuel it can find to burn hotter and stronger, and it also moves very quickly when there is a lot of fuel.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Where does fire get its energy from?
b. What is one source of electrical energy?

Answers to the checkpoint questions are as follows:

a. Fire gets its energy from the fuel it burns.
b. Electrical energy can come from burning coal, a wind farm or a hydroelectric power station.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Energy around us	140
Study & Master	Energy around us	102-105
Day by Day	Energy	103-104
Platinum	Energy around us	118
Viva	Energy around us	102
Spot On	Energy around us	60-62
Oxford Successful	Energy around us	84-85
Shuter & Shooter	Energy around us	84-86
Sasol Inzalo Bk B	Energy around us	18-27

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=mtKN__s0LXY (10min) [Energy is all around us]

3 A

Term 3, Week 3, Lesson A
Lesson Title: Sound and movement energy
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy around us
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain where energy comes from
- identify other possible sources of energy.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 6.1 and 6.2: Sound and movement energy	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What type of energy can we see?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

We can see light energy.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

SOUND AND MOVEMENT ENERGY

1. Sound is energy we can hear.
2. If you clap your hands, drop your book, or sing, you are making sounds.
3. The intensity of sound is measured in decibels.
4. The louder the sound, the higher the decibels.
5. The louder the sound, the more energy it has.

2. Explain this to the learners as follows:
   a. We need to know that another type of energy is sound energy. Sound is energy people can hear.
   b. Sound energy cannot be seen.
   c. Tell the learners to clap softly. Ask the learners what they hear. Tell the learners to clap loudly. Ask the learners what they hear.
   d. We measure sound in units call decibels. The louder the sound, the higher the decibels.
   e. Using Resource 6.1 and 6.2, show the learners the examples of sources of sound energy.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What type of energy can we hear?
b. What is sound measured in?

Answers to the checkpoint questions are as follows:

a. Energy we can hear is called sound.
b. Sound is measured in decibels

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

SOUND AND MOVEMENT ENERGY

1. Many objects make sound energy.
2. When it is not wanted and becomes irritating, it is called noise pollution.
3. When something moves it has movement energy.
4. When you push something and it moves, you have created the energy for the object.
5. If you kick a soccer ball and it moves, you have given it energy to move.

2. Read the information on the board to the learners.
   a. Explain that when there is a lot of unwanted and irritating sound, it is called noise pollution. This can be very annoying to people, and affect their lives.
   b. People do not want to have continuous noise in their ears, or to live near places that are very loud.Ask the learners if they have any questions. Provide answers where necessary.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the pictures on Resource 6.1 and 6.2, tell the learners to copy these questions down into their book and answer them:

TASK

1. In Resource 6.1, there are circles in front of the megaphone. Can sound be seen?
2. In Resource 6.2, which movements use more energy than others?

5. Give learners some time to complete this task in their exercise books.
6. Model answer

MODEL ANSWER

1. *No, sound cannot be seen*
2. *Moving up, moving through, and moving over will use more energy than the others which just move straight*.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What is noise pollution?
b. How does a person give an object movement energy?

Answers to the checkpoint questions are as follows:

a. Noise pollution occurs when sound is loud, unwanted and irritating.
b. A person pushes or moves an object, transferring energy to the object.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Energy around us	140
Study & Master	Energy around us	102-105
Day by Day	Energy	103-104
Platinum	Energy around us	118
Viva	Energy around us	102
Spot On	Energy around us	60-62
Oxford Successful	Energy around us	84-85
Shuter & Shooter	Energy around us	84-86
Sasol Inzalo Bk B	Energy around us	18-27

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=86PzkRbw4_U (4min 14sec) [Different forms of energy]

3 B

Term 3, Week 3, Lesson B
Lesson Title: Sources of stored energy
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy around us
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain where energy comes from
- explain the path of energy from the Sun to our bodies
- identify other possible sources of energy.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 7.1 and 7.2: Sources of stored energy	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What type of energy can we hear?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

We can hear sound energy.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

SOURCES OF STORED ENERGY

1. A **source** of energy is where we get energy.
2. Food is a source of energy for our bodies.
3. The energy that is stored in food comes from plants.
4. Plants use energy from the Sun to make food.
5. Living things need food for energy.

2. Explain this to the learners as follows:
   a. In order to have energy, we need to find a source. A source of energy is a place or an object that holds energy waiting to be used.
   b. The Sun provides heat and light energy to the Earth. Plants use this and make their own food for growth and store it inside themselves. Animals eat the plants and use the energy.
   c. Using Resource 7, show the learners the examples of sources of energy.
4. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What is a source of energy?
b. What good does food do for people?

Answers to the checkpoint questions are as follows:

a. A source of energy is where we get our energy from.
b. Food holds energy that people need to live.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

OTHER SOURCES OF ENERGY

1. The food that we eat has energy stored in it.
2. When we eat it, the energy is released into our bodies for us to use.
3. People also use energy that was stored in the bodies of plants and animals long ago.
4. Sources of this energy include wood, coal, crude oil and natural gas.
5. When we make a fire, the fire uses the energy stored in the wood or charcoal.

2. Read the information on the board to the learners.
   a. Explain that the food that people eat has energy stored in it. When we eat food, energy is released into our bodies.
   b. Other sources of energy include plants and animals that died a long time ago. If they were left alone, their bodies will turn to a material that can be used for fuel for energy.
   c. Wood, coal, crude oil and natural gas are examples of this stored energy.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the pictures on Resource 7.1 and 7.2, tell the learners to copy these questions down into their book and answer them:

TASK

1. What source of energy is shown in each picture?
2. What colour is crude oil?

5. Give learners some time to complete this task in their exercise books.
6. Model answer

MODEL ANSWER

1. *Picture 7.1: coal, picture 7.2: crude oil*
2. *Crude oil is black.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Can we get energy out of the bodies of animals and plants that died?
b. What are four examples of energy sources that have been stored for a long time?

Answers to the checkpoint questions are as follows:

a. Yes, we can get energy from the bodies of animals and plants.
b. Wood, coal, crude oil, and natural gas

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Energy is stored and transferred	143-144
Study & Master	Energy is stored	102-105
Day by Day	Energy is stored in energy sources	105-106
Platinum	Sources of stored energy	119
Viva	Identifying sources of energy	103
Spot On	Sources of energy	63
Oxford Successful	Where is energy stored?	86
Shuter & Shooter	Energy is stored in sources	86-87
Sasol Inzalo Bk B	Stored energy	28

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=ZsXQ9ijV54w (4min 39sec) [Sources of energy]

3 C

Term 3, Week 3, Lesson C
Lesson Title: Energy can be transferred
Time for lesson: 1½ hours

A POLICY AND OUTCOMES

Sub-Topic	Energy around us
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain what it is called when energy moves from one thing to another
- explain the path of energy from food to the movement of an object.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 8: Energy can be transferred	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What source of energy do we get from fallen trees?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

We get wood from fallen trees.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

ENERGY CAN BE TRANSFERRED

1. Energy can be **transferred** from one object to another.
2. Energy can go from a source of energy to where it is needed.
3. This is called energy transfer.
4. During this process energy may change from one type to another.
5. For example: when we burn wood to make fire, the energy stored in the wood changes to light and heat energy.

2. Explain this to the learners as follows:
   a. We need to know that energy moves from one thing to another. We have already seen how energy moves from the Sun to a plant and from a plant to an animal.
   b. The is called energy transfer.
   c. Energy changes from one type to another. Energy changes from stored energy to light, or heat, or sound, or movement energy.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What is it called when energy moves from one object to another?
b. What happens to the energy stored in wood when it is burnt?

Answers to the checkpoint questions are as follows:

a. When energy moves it is called energy transfer.
b. The energy stored in wood is transferred to light and heat energy when it is burnt.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

THE TRANSFER OF ENERGY

1. Energy is never lost and it cannot be destroyed.
2. It only changes from one form to another.
3. For example: you eat your lunch which gives you energy to play soccer.
4. When you run, the energy stored in the food is changed to movement energy.
5. When you kick the ball, the energy stored in your legs is transferred to the ball and it moves.

2. Read the information on the board to the learners.
   a. Explain that the food that people eat stores energy. When we eat food, the energy is released into our bodies. This gives us energy to do tasks.
   b. When we move an object, we use energy in our bodies to move our arms and legs. This movement energy is transferred to the object and it moves.
   c. Show the learners Resource 8. Point to the boy eating, the sandwich and the boys playing soccer. The energy in the sandwich ends up in the ball moving.
4. Ask the learners if they have any questions. Provide answers where necessary.
5. After looking at the pictures on Resource 8, tell the learners to copy these questions down into their book and answer them:

TASK

Describe the path of energy from the Sun to a soccer ball moving on a field.

5. Give learners some time to complete this task in their exercise books.
6. Model answer

MODEL ANSWER

The Sun shines down on the plants.
The plants use the energy to produce food and grow.
People harvest the plant and use it to make food for themselves.
People eat the food and the energy is transferred into their bodies.
They play soccer, and this energy is used to move them around the field.
Players will kick the ball, transferring movement energy to the ball which will then move.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Can energy be lost? Explain
b. What happens to energy in food before a person moves an object?

Answers to the checkpoint questions are as follows:

a. Energy cannot be lost. It simply changes from one form to another.
b. The energy in food moves into the person eating the food. That energy changes to movement energy when a person moves the object.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Energy is stored and transferred	143-144
Study & Master	Energy transfers from sources	106
Day by Day	Energy can be transferred from a source	106-107
Platinum	Energy can be transferred	120
Viva	Identifying sources of energy	104
Spot On	Sources of energy	63
Oxford Successful	Energy can be transferred	86
Shuter & Shooter	Energy transfer	87-88
Sasol Inzalo Bk B	Transfer of energy	29

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=z8a-L1lkq3w (5min 46sec) [Science for kids: Transformations video]

4 A

Term 3, Week 4, Lesson A
Lesson Title: Input and output energy
Time for lesson: 1½ hours

A POLICY AND OUTCOMES

Sub-Topic	Energy around us
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain what flow diagram are and why we need to use them
- explain how to draw a flow diagram.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	✓
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 9: Drawing a flow diagram	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

When wood is burnt, what sort of energy is produced?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.Discuss their answers with the learners.
4. Write the model answer onto the chalkboard.

When wood is burnt, light and heat energy are produced.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

DRAWING A FLOW DIAGRAM

1. A **flow diagram** helps us to understand the order in which something happens.
2. A flow diagram shows you the steps in a process in the correct order.
3. A flow diagram links pieces of information in the order in which they occur.
4. A flow diagram can use pictures or words for each step of the process.
5. A flow diagram is usually drawn using boxes, labels and arrows.

2. Explain this to the learners as follows:
   a. We can represent a process containing much information as a flow diagram.
   b. A flow diagram shows the steps of the process in the right order.
   c. It can use pictures or words to describe each step of the process.
   d. The boxes of the diagram are linked with directional arrows to show which direction the process is taking.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What does a flow diagram help us to understand?
b. What does a flow diagram use to show information?

Answers to the checkpoint questions are as follows:

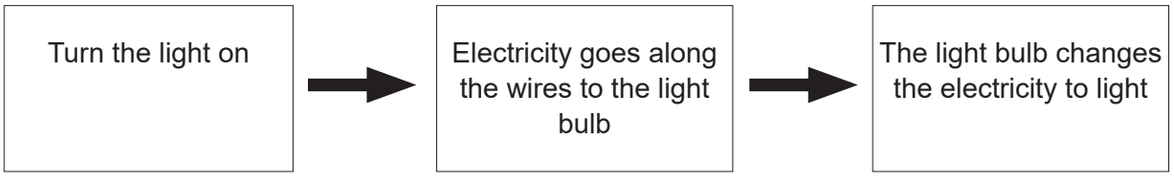
a. A flow diagram helps us to understand the order in which something happens.
b. A flow diagram uses boxes, labels and arrows to show information.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

HOW TO DRAW A FLOW DIAGRAM

1. Start with the first step in the process. This will be the first link of information you are showing.
2. Draw an arrow to lead you to the next step in the process, or the next piece of information.
3. Carry on using arrows to link the steps of the process or pieces of information in order.
4. This is an example of a flow diagram. It shows how an electric light works.



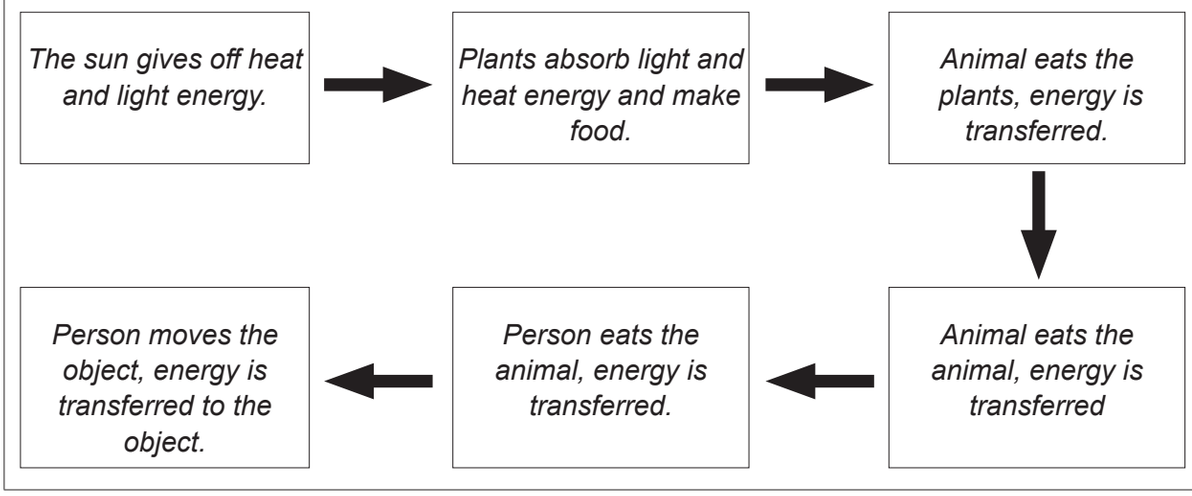
2. Read the information on the board to the learners.
   a. Explain that in order to draw a flow diagram, you need to arrange your information in the correct order.
   b. Draw the correct number of boxes and fill in each step as you proceed.
   c. The boxes must have arrows to show the direction of the process.
   d. Show the learners Resource 9 which shows a process in the order that it happens. The arrows show direction.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the flow diagram on Resource 9, tell the learners to copy this task into their workbooks and answer it:

TASK

1. Using a flow diagram, show the process of energy transferring from the Sun, to plants, to animals, to people, and to an object.
2. Give your diagram a suitable title.

5. Give learners some time to complete this task in their exercise books.
6. Model Answer: Flow diagram showing the path of energy from the Sun to an object

MODEL ANSWER



Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What does the first step of the process of a flow diagram show?
b. What is the second step of the flow diagram on the chalkboard?

Answers to the checkpoint questions are as follows:

a. The first step shows the first link of the information.
b. The second step indicates the way electricity travels along wires to the light bulb.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Energy is stored and transferred	143-144
Study & Master	Energy from the sun	100
Day by Day	Drawing a flow diagram	96
Platinum	Draw a flow diagram for a process	121
Viva	-	-
Spot On	-	-
Oxford Successful	Flow diagram	90
Shuter & Shooter	-	-
Sasol Inzalo Bk B	-	-

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://wiki.kidzsearch.com/wiki/Flow_chart [Website]

4 B

Term 3, Week 4, Lesson B
Lesson Title: Input and output energy
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy around us
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain what an input of energy is
- explain what an output of energy is and how the input of energy affects it.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 10: Input and output energy	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What does a flow diagram show?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

A flow diagram shows the steps of a process in the correct order.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

INPUT OF ENERGY

1. A system is something that has two or more parts that work together to make something happen.
2. Machines and appliances are types of systems.
3. A machine needs energy to make it work.
4. The energy that goes into a system is called the input of energy.
5. For example: the wood going into a fire is the input of energy.

2. Explain this to the learners as follows:
   a. We need to know that systems contain two or more parts that together make up a complex unit. This unit is needed to do work.
   b. In order for the system or machine to work, it needs an input of energy.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What is a system?
b. What does a machine need to make it work?

Answers to the checkpoint questions are as follows:

a. A system is something that has two or more parts that work together to make something happen.
b. A machine needs energy to make it work.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

OUTPUT OF ENERGY

1. The energy that comes out of a system is called the output of energy.
2. The heat that comes out of a wood fire is the output of energy. For example: a light bulb gives off heat, but not enough to keep warm.
3. A fire can be made to burn hotter and stronger by adding more wood.
4. When you give more input of energy, more output of energy is produced.
5. Machines and appliances provide an output of energy that is useful.
6. For example: a light bulb gives off heat, but not enough to keep warm.

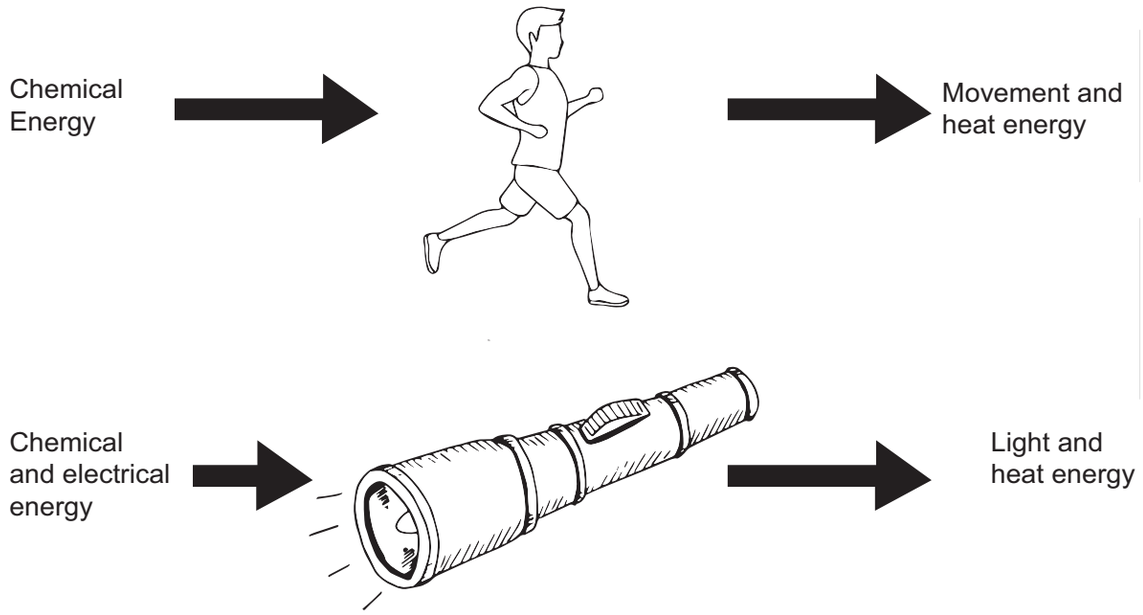
2. Read the information on the board to the learners.
   a. When there is an input of energy into a system or machine, the machine will produce the work that it has been designed for. It will then produce an output of energy.
   b. The input of energy into a fire is firewood. The output of energy is heat and light.
   c. If you add more wood, the fire will produce more heat and light.
   d. Show the learners Resource 10 which shows two processes that happen in the correct order. The arrows show direction. There is an input of energy which results in an output of energy.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the pictures on Resource 10, tell the learners to copy these instructions into their workbooks and follow them:

TASK

1. Draw two pictures in your workbook of input and output of energy into a system.
2. Give your diagrams a suitable title.

5. Give learners some time to complete this task in their exercise books.
6. Model answer example: Learners might have different pictures.

MODEL ANSWER



Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What do you call the energy that comes out of a system?
b. What happens when you give more input of energy?

Answers to the checkpoint questions are as follows:

a. The energy that comes out of a system is called the output of energy.
b. When you give more input of energy, more output of energy is produced.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Input and output energy	146
Study & Master	Input and output energy	107-109
Day by Day	Input and output energy	108
Platinum	Input and output energy	122
Viva	Input and output energy	104-105
Spot On	Input and output energy	64
Oxford Successful	Input and output of energy	88-90
Shuter & Shooter	Input and output energy	89-92
Sasol Inzalo Bk B	Input and output energy	30

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=wyVF6R9e6xE (1min 41sec) [What is energy: lesson for kids]

4 C

Term 3, Week 4, Lesson C
Lesson Title: Using machines and appliances
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy around us
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain how a simple home appliance works
- explain how the input of energy affects the output of energy in simple systems.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions	✓	13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	✓
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 11: Using machines	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What is the output energy?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

The output energy is the energy that is produced by the system.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

USING MACHINES

1. Many appliances use electricity to work.
2. These are called electrical appliances.
3. An electric stove and a kettle use electric energy to work.
4. When they are switched on, the electricity flows in and the elements heat up.
5. This heat cooks the food and boils the water.
6. The input energy is electricity and the output energy is heat.

2. Explain this to the learners as follows:
   a. We need to know that appliances are systems that do work for people.
   b. Many appliances use electricity in order to work. A stove and a kettle need electricity to work.
   c. When the electricity is turned on, the element turns on and heats the contents.
   d. The input energy is electricity and the output energy is heat.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What part in the kettle heats up when the electricity is turned on?
b. What is the output energy in a kettle?

Answers to the checkpoint questions are as follows:

a. The element heats up when the electricity is turned on.
b. The output of energy in a kettle is heat.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

OUTPUT OF LIGHT ENERGY

1. A lamp and a torch also use electrical energy to work.
2. When a lamp and a torch are switched on, the electricity flows in and the bulb lights up.
3. The light lets us see in the dark.
4. The input energy is electricity.
5. The output energy is light.

2. Read the information on the board to the learners.
   a. Explain that lights and torches also use electricity. When we switch them on, the current flows and the lights come on.
   b. Torches use the charge from batteries, as we cannot plug them in all the time.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the pictures on Resource 11, tell the learners to copy this table into their book and complete it:

Input and output of energy in appliances

Picture	Appliance Name	Input energy	Output energy
1			
2			
3			
4			
5			

5. Give learners some time to complete this task in their exercise books.
6. Model answer example: Learners might have different pictures.

MODEL ANSWER

Picture	Appliance Name	Input energy	Output energy
1	Kettle	Electricity	Heat
2	Stove	Electricity or gas	Heat
3	Lamp	Electricity	Light
4	Toaster	Electricity	Heat
5	Fan	Electricity	Movement

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What happens in a torch when it is switched on?
b. What is the output energy in a torch?

Answers to the checkpoint questions are as follows:

a. When a torch is switched on, the bulb lights up.
b. The output energy in a torch is light.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Machines, appliances and energy	147-150
Study & Master	Working with input and output energy	108-109
Day by Day	Machines and appliances provide an output energy or work that is useful to us	109-110
Platinum	Input and output of energy	122-125
Viva	Input and output energy	104-106
Spot On	Input and output energy	64-65
Oxford Successful	Input and output energy	88-90
Shuter & Shooter	Input and output energy	89-92
Sasol Inzalo Bk B	Machines and appliance	31-34

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=wyYoE4fXKbE (44sec) [How do electric kettles work?]
2. https://www.youtube.com/watch?v=102LUG7L7MQ (1min 43sec) [How an electric stove works]
3. https://www.youtube.com/watch?v=0WzAs5V034w (33sec) [How does a torch work?]
4. https://www.youtube.com/watch?v=CU8cVH8YYuo (1min 42sec) [How a radio broadcast works]

5 A

Term 3, Week 5, Lesson A
Lesson Title: Movement and Energy
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy around us
CAPS Page Number	23

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain how movement energy can be converted into sound energy
- explain how human movement can power a system.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions	✓	13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	✓
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues	✓	12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 12: Working machines	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What is the output of energy of a kettle?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

The output of energy of a kettle is heat.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

MOVEMENT ENERGY

1. A person applies movement energy on a drum to create sound.
2. When a person beats a drum hard, it makes a loud sound.
3. When a person beats a drum softly, it makes a soft sound.
4. The energy you need to beat a drum is the input of energy.
5. The sound the drum makes is the output of energy.

2. Explain this to the learners as follows:
   a. There are also systems that do not require electricity to work. The job that they are designed to do determines their structure, and ease of use.
   b. The input of energy is movement energy and the output of a drum is sound.
   c. The harder you beat the drum, the louder the sound will be.
   d. The more input energy that is put in results in more output energy.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. Why does a drum make a noise?
b. What is the output energy when a drum is beaten?

Answers to the checkpoint questions are as follows:

a. A drum makes a noise because someone beats it.
b. The output energy from a drum is sound.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

USING MOVEMENT ENERGY TO RIDE A BICYCLE

1. Bicycles are objects that need movement energy to work.
2. People that ride bicycles need to pedal to make the bicycle move.
3. The action of pedaling is the input of energy.
4. The output of energy is the bicycle moving forward.
5. To make the bicycle move faster the person must cycle faster.

2. Read the information on the board to the learners.
   a. When a person is pedaling a bicycle, the person uses movement energy to move the bicycle forward.
   b. When more movement energy is put in, the bicycle will go faster.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the pictures on Resource 12, tell the learners to copy this table into their book and complete it:

Instructions

Look at picture 1:

1. Draw a flow diagram to show how a bicycle works.
2. Give your flow diagram a title.

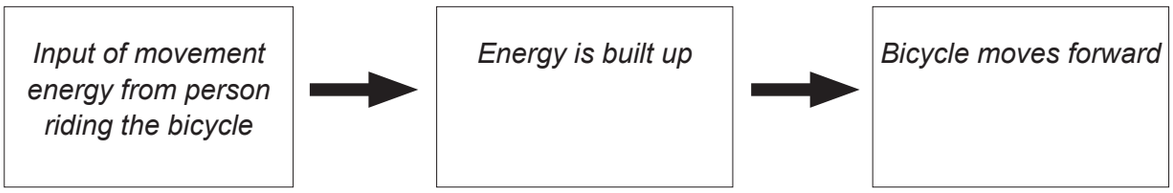
Look at picture 2:

3. How can the output of energy be increased and decreased on a drum?

5. Give learners some time to complete this task in their exercise books.
6. Model answer example: Learners might have different pictures.

MODEL ANSWER

1.



2. Flow diagram showing how a bicycle works

3. The output of energy can be increased by playing the drum strongly. It can be decreased by the person beating it lightly.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. In order for a bicycle to work, what type of energy does it need?

b. What is the input and the output energy when a person rides a bicycle?

Answers to the checkpoint questions are as follows:

a. A bicycle needs movement energy to work.

b. The input is the person pedaling and the output energy is the bicycle moving.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Machines, appliances and energy	148-150
Study & Master	Working with input and output energy	108-109
Day by Day	Machines and appliances provide an output of energy or work that is useful to us	109-110
Platinum	Input and output of energy	122-125
Viva	Input and output energy	104-106
Spot On	Input and output energy	64-65
Oxford Successful	Input and output energy	88-90
Shuter & Shooter	Input and output energy	89-92
Sasol Inzalo Bk B	Machines and appliance	31-34

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=INZwIgYT_AY (1min 41sec) [How does a bicycle work?]
2. https://www.youtube.com/watch?v=1a1cCvGiUww (8min 42sec) [How do drums make sound?]

TOPIC OVERVIEW:

Movement and energy in a system

Term 3, Weeks 5B – 7B

A. TOPIC OVERVIEW

TERM 3, WEEKS 5B – 7B

- This topic runs for 2½ weeks.
- It is presented over 7 lessons.
- This topic counts for 20% in the end-of-year exam.
- This topic's position in the term is as follows:

LESSON	WEEK 1			WEEK 2			WEEK 3			WEEK 4			WEEK 5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

LESSON	WEEK 6			WEEK 7			WEEK 8			WEEK 9			WEEK 10		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

B. SEQUENTIAL TABLE

GRADE 1 & 3	GRADE 4	GRADE 5
LOOKING BACK	**CURRENT**	**LOOKING FORWARD**
-	• Movement and musical instruments • Many musical instruments systems use movement input energy (such as blowing, beating and plucking) to make them work • Many instruments have parts that can move or vibrate • Musical instruments produce sound as the main output energy	• Elastic and springs • We can make things move using stretched or twisted elastic and compressed springs • When we stretch or twist elastic or compress a spring, we store energy in it • When we release the elastic or spring again, we get movement energy

	• We are aware of energy around us, including movement, heat, light, sound	

C. SCIENTIFIC AND TECHNOLOGICAL VOCABULARY

Ensure that you teach the following vocabulary at the appropriate place in the topic:

	TERM	EXPLANATION
1.	musical instrument	The measure of the warmth of coldness of an object or a place
2.	system	Electricity that is made by the movement of water
3.	plucking	A unit for measuring the loudness of sounds
4.	percussion	The introduction of harmful things into the environment
5.	string instruments	A thing or a place from which we get something
6.	wind instruments	Moved from one place to another
7.	classify	A diagram that shows a step-by-step process through a procedure
8.	vibrate	A combination of simple parts that form a complicated whole
9.	indigenous	A device made for a particular purpose or use
10.	strumming	

D. UNDERSTANDING THE USES / VALUE OF SCIENCE

There is a value to knowing that musical instruments require movement energy (input of energy) in order to produce sound. This sound is also known as the output of sound. We need to know where this energy comes from. It is important to know the different forms and types of musical instruments, and how they all have different ways of being played, and how they produce different sounds.

E. PERSONAL REFLECTION

Reflect on your teaching at the end of each topic:

Date completed:	
Lesson successes:	
Lesson challenges:	
Notes for future improvement:	

5 B

Term 3, Week 5, Lesson B
Lesson Title: Movement and musical instruments
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Movement and energy in a system
CAPS Page Number	24

Lesson Objectives

By the end of the lesson, learners will be able to:

- understand that musical instruments are systems
- explain how input energy is converted to output energy.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 13.1 and 13.2: Movement and musical instruments	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

Where does a bicycle get its input energy?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

A bicycle gets its input energy from the person who rides it.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

MOVEMENT AND MUSICAL INSTRUMENTS

1. **Musical instruments** are also **systems**.
2. They need an input of energy to work properly – to produce a sound.
3. They have parts that work together to make something happen.
4. If there is no input of energy, the instrument will not make a sound.
5. People give instruments the energy they need to produce sound.

2. Explain this to the learners as follows:
   a. We need to know that musical instruments are systems. Systems are a combination of small parts that work as one to complete a job or to make something happen.
   b. Musical instruments need energy to work. They specifically need an input of energy.
   c. This input of energy comes from the people that play the instrument.
4. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What do musical instruments need to work properly?
b. Where do instruments get their energy from in order to produce sound?

Answers to the checkpoint questions are as follows:

a. Instruments need an input of energy to work properly.
b. People give instruments the energy they need to produce sound.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

MOVEMENT INPUT ENERGY

1. Instruments use movements – hitting or beating, shaking, blowing or plucking – to make a sound.
2. Sound is also a form of movement energy.
3. The boy shakes the shaker – movement input energy.
4. The shaker makes a sound – sound output energy
5. Look at the following flow diagram: Fingers pluck a string of a guitar → system (guitar) → guitar makes a sound.

2. Read the information on the board to the learners.
   a. Explain that there are different ways that a person can play various instruments.
   b. Explain that these include hitting or beating, shaking, blowing or **plucking**.
   c. Sound is a form of movement energy. It is created when there is an input of energy into the musical instrument. This is then converted to an output of energy which is sound.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the pictures on Resource 13.1 and 13.2, tell the learners to copy this table into their book and complete it:

TASK

1. What are the four instruments called?
2. What is the input of energy from the little boy playing the guitar?

5. Give learners some time to complete this task in their exercise books.
6. Model answer example: Learners might have different pictures.

MODEL ANSWER

1. *A drum, shakers, a guitar and a trumpet*
2. *The input of energy for the guitar is the movement energy coming from the little boy plucking the strings.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What form of energy is sound?
b. What form of movement does a vuvuzela use to make sound?

Answers to the checkpoint questions are as follows:

a. Sound is a form of movement energy.
b. A vuvuzela uses blowing movement.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Movement and musical instruments	154-156
Study & Master	Movement and musical instruments	110-112
Day by Day	Movement and musical instruments	113-115
Platinum	Movement and musical instruments	128-129
Viva	Movement and musical instruments	107-108
Spot On	Movement and musical instruments	66-67
Oxford Successful	Movement and musical instruments	91-93
Shuter & Shooter	Movement and musical instruments	93
Sasol Inzalo Bk B	Movement and musical instruments	35-36

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=IvUU8joBb1Q (4min 32sec) [Wintergatan: Marble Machine]

5 C

Term 3, Week 5, Lesson C
Lesson Title: Types of instruments
Time for lesson: 1½ hours

A POLICY AND OUTCOMES

Sub-Topic	Movement and energy in a system
CAPS Page Number	24

Lesson Objectives

By the end of the lesson, learners will be able to:

- identify that musical instruments can be categorised into three categories
- explain how each category of instruments is played.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying	✓	11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 13.1 and 13.2: Movement and musical instruments	
Resource 14.1, 14.2 and 14.3: Types of instruments	
Poster for Term 3	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What sort of energy is the input energy for a musical instrument?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

Movement energy is the input energy for a musical instrument.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

TYPES OF INSTRUMENTS

1. Musical instruments are grouped or classified according to how they are played.
2. Different instruments need different types of movements as input energy.
3. We play **percussion instruments** by shaking, hitting or beating.
4. We play **string instruments** by plucking, strumming, or rubbing the strings.
5. We play **wind instruments** by blowing air through them.

2. Explain this to the learners as follows:
   a. We need to know that musical instruments are grouped or categorised according to how they are played.
   b. Different instruments are designed to be played differently. The input of energy can be different forms of movement energy.
   c. The three main groups of instruments are percussion, string and wind.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. How do people make a sound with a percussion instrument?
b. Which type of instrument works by blowing air through it?

Answers to the checkpoint questions are as follows:

a. People make a sound with a percussion instrument by shaking, hitting or beating it.
b. A wind instrument works by blowing air through it.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

HOW INSTRUMENTS ARE PLAYED

1. Each group of instruments consists of many different types.
2. Percussion instruments include drums, shakers, xylophones, tambourines, and marimbas.
3. String instruments include guitars, harps, violins, and cellos.
4. Wind instruments include whistles, trumpets, vuvuzelas, and saxophones.
5. To **classify** an instrument, look at how it is played.
6. If it needs to be hit, it is a percussion instrument.
7. If it uses air, it is a wind instrument.
8. If it has strings, it is a string instrument.

2. Read the information on the board to the learners.
   a. Explain that there are different ways that a person can play various instruments.
   b. Explain that these include hitting or beating, shaking, blowing or plucking.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the pictures on Resource 13.1 and 13.2, Resource 14 and the Term 3 poster, tell the learners to copy these questions down into their book and answer them:

TASK

1. On Resource 13.1 and 13.2, what type of instrument would each one be grouped as?
2. On Resource 14.1, 14.2 and 14.3 what do the instruments in each category have in common?

5. Give learners some time to complete this task in their exercise books.
6. Model answer example: Learners might have different pictures.

MODEL ANSWER

1. *The drum and shakers are percussion instruments. The guitar is a string instrument, and the trumpet is a wind instrument.*

2. *The percussion instruments have an area that needs to be hit. The string instruments all have strings that need to be plucked, and the wind instruments all use air to make sound.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

c. What are three examples of string instruments?
d. How can you tell if an instrument is a wind instrument?

Answers to the checkpoint questions are as follows:

a. Any three from: guitars, harps, violins, and cellos (there are others, too)
b. If the sound is made by putting air into the instrument, it is a wind instrument.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Types of musical instruments	157-159
Study & Master	-	
Day by Day	-	
Platinum	Types of musical instruments	129
Viva	Compare musical instruments	110-111
Spot On	-	
Oxford Successful	-	
Shuter & Shooter	Types of musical instruments	93-95
Sasol Inzalo Bk B	Musical instruments from two different cultures	41-42

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=zqnzCq-95jg (8min 29sec) [Musical instruments, part 1 of 2]
2. https://www.youtube.com/watch?v=p4zjlfruRGI (8min 49sec) [Musical instruments, part 2 of 2]

6 A

Term 3, Week 6, Lesson A
Lesson Title: Instrument parts that move or vibrate
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Movement and energy in a system
CAPS Page Number	24

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain what part of each instrument is responsible for the creation of sound
- explain how the input of energy is converted to the output of energy.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting	✓	14. Designing	✓
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying	✓	11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues	✓	12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 15.1, 15.2, 15.3 and 15.4: Instrument parts that move or vibrate	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What are musical instruments that use air to make sound?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.Discuss their answers with the learners.
4. Write the model answer onto the chalkboard.

They are wind instruments.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

INSTRUMENT PARTS THAT MOVE OR VIBRATE

1. Some instruments have parts that can move or **vibrate**.
2. When something makes tiny movements, we say it vibrates.
3. Seeds or beads inside shakers vibrate when they are shaken.
4. The skin of the drum vibrates when somebody hits it.
5. The strings of a guitar vibrate when they get plucked.
6. The air inside a pennywhistle vibrates when it is blown.

2. Explain this to the learners as follows:
   a. We need to know that musical instruments have small parts that can move or vibrate. A vibration is when something makes many small fast movements.
   b. The seeds or beads in a shaker vibrate when shaken. The skin of a drum vibrates when it is hit. The strings of a string instrument vibrate when they are moved. The air inside a wind instrument vibrates when it moves through the instrument.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What does vibrate mean?
b. What part of a drum vibrates when it is hit?

Answers to the checkpoint questions are as follows:

a. When something makes many tiny movements, we say it vibrates.
b. The skin of a drum vibrates when it is hit.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

HOW INSTRUMENTS WORK

1. Musical instruments work because movement causes vibrations which result in sound.
2. Musical instruments have moving parts, which make them a system.
3. Moving parts change input energy to produce output energy.
4. The strumming or plucking of strings is the movement energy used to make vibrations.
5. The vibrations of the strings are the input energy used to make sounds (the output energy).

2. Read the information on the board to the learners.
   a. Explain that the vibrations in the musical instrument cause the sound of the instrument.
   b. The input energy is converted to output energy by the moving parts in some instruments.
   c. The movement energy put in by the person playing the instrument is the input energy. The output energy is the sound the instrument makes.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the pictures on Resource 15.1, 15.2, 15.3 and 15.4, tell the learners to copy these questions down into their book and answer them:

TASK

1. What part of the guitar moves and vibrates?
2. What part of the snare drum move and vibrates?
3. How do you think the cymbals make a sound?
4. What happens to the air in the tuba?

5. Give learners some time to complete this task in their exercise books.
6. Model answer example: Learners might have different pictures.

MODEL ANSWER

1. *The guitar strings move and vibrate.*
2. *The skin and the snare underneath the drum move and vibrate.*
3. *The cymbals make a sound when they are bashed together.*
4. *The air in the tuba vibrates and causes a sound.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What causes vibrations in an instrument?
b. What is the output energy in a musical instrument?

Answers to the checkpoint questions are as follows:

a. Movement causes vibrations in an instrument.
b. The output energy in a musical instrument is sound.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Musical instruments are systems	154-156
Study & Master	How the shape and size of instruments make sound louder	111-112
Day by Day	Musical instrument parts can move or vibrate	114-116
Platinum	Musical instruments have parts that move or vibrate	130
Viva	Investigating musical instruments	108
Spot On	How musical instruments use music to create sound	66-67
Oxford Successful	Movement input energy	91-93
Shuter & Shooter	Musical instruments	94-95
Sasol Inzalo Bk B	Movement causes sound	38-39

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=QXjdGBZQvLc (9min 49sec) [Music in slow motion]
2. https://www.youtube.com/watch?v=9L9AOPxhZwY (3min 15sec) [Vibrations of strings on a digital camera]
3. https://www.youtube.com/watch?v=AGjxfx8sy6s (7min 39sec) [Sound for kids: sound waves and vibrations]
4. https://www.youtube.com/watch?v=Q3oItpVa9fs (5min 52sec) [Cymatics: Science vs Music – Nigel Stanford]

6 B

Term 3, Week 6, Lesson B
Lesson Title: Indigenous African musical instruments
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Movement and energy in a system
CAPS Page Number	24

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain that there are many musical instruments that are indigenous to Africa
- identify instruments that are indigenous to Africa and learn how they are played.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	✓

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying	✓	11. Doing Investigations		17. Communicating	
6. Identifying problems & issues	✓	12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 16.1, 16.2 and 16.3: Indigenous African musical instruments	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What do the moving parts do in a musical instrument?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

The moving parts convert input energy to output energy.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

INDIGENOUS AFRICAN MUSICAL INSTRUMENTS

1. Music, song and dance are very important to all people in Africa.
2. Indigenous African musical instruments were first designed, made and used in Africa.
3. Drums are found all over the world, but in each place the design and materials are different.
4. The gorah (long bow) and /khou (short bow) are San string instruments.
5. These work by blowing on the string while tapping the instrument with a stick.

2. Explain this to the learners as follows:
   a. We need to know that there have been many instruments invented and developed in Africa. These are indigenous to Africa - they are local to Africa.
   b. Drums can be found all over the world, but there are many that are unique to Africa, due to the shape and the materials used to make them.
   c. The gorah and /khou are San string instruments. They are both played in the same way, blowing on the string and hitting them with a small stick.
4. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. Are drums only found in Africa?
b. How does a gorah make sound?

Answers to the checkpoint questions are as follows:

a. Drums are not only found in Africa.
b. The gorah works by someone blowing on the string while tapping the instrument with a stick.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

DIFFERENT INSTRUMENTS

1. The guashi is a San string instrument, made from a hollowed tree trunk, with strings tied to short sticks.
2. A blikkitaar is a more modern San homemade guitar that uses an empty oil can for the sound box.
3. The Zulu igemfe is a wind instrument similar to a flute. It is made from reeds.
4. The ugubhu is a Zulu bow instrument that has a calabash attached to the lower end. It is played like the gorah of the San.
5. The mbira (or kalimba) is a small wooden instrument with metal keys. The keys are plucked with the thumbs.
6. The mbila (marimba) has wooden bars of different lengths. Each bar makes a different note when it is hit.

2. Read the information on the board to the learners.
   a. Explain that there are many more indigenous African instruments. Some are indigenous to Southern Africa and some have been brought down through Africa as people have migrated.
   b. The input energy is converted to output energy by the moving parts in some instruments.
   c. The movement energy put in by the person playing the instrument is the input energy. The output energy is the sound the instrument makes.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. After looking at the pictures on Resource 16.1, 16.2 and 16.3, tell the learners to copy these questions down into their book and answer them:

TASK

1. What are the indigenous instruments called?
2. Categorise the different instruments into percussion, string or wind instruments.

5. Give learners some time to complete this task in their exercise books.
6. Model answer example: Learners might have different pictures.

MODEL ANSWER

1. *A mbila or marimba, a mbira or kalimba, an igemfe, and a gorah, /khou and an ugubhu.*
2. *Percussion: mbila or marimba, mbira or kalimba; Wind: igemfe; String: gorah, /khou and ugubhu*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What is an igemfe?
b. What is another name for a mbira?

Answers to the checkpoint questions are as follows:

a. The igemfe is a wind instrument similar to a flute, made from reeds.
b. The mbira is also known as a kalimba..

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Indigenous musical instruments	160-162
Study & Master	Indigenous musical instruments	113-115
Day by Day	Indigenous musical instruments	115-117
Platinum	Indigenous musical instruments	131-132
Viva	Indigenous musical instruments	109-110
Spot On	Indigenous musical instruments	68-69
Oxford Successful	-	
Shuter & Shooter	Indigenous musical instruments	94-95
Sasol Inzalo Bk B	Indigenous musical instruments in South Africa	39-42

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=ejMLRrKY9IU (1min 52sec) [Traditional African musical instruments]

6 C

Term 3, Week 6, Lesson C
Lesson Title: Designing a musical instrument
Time for lesson: 1½ hours

A POLICY AND OUTCOMES

Sub-Topic	Movement and energy in a system
CAPS Page Number	24

Lesson Objectives

By the end of the lesson, learners will be able to:

- formulate the best design to use for a musical instrument
- identify the requirements for the musical instrument.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	✓

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting		14. Designing	✓
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	✓
5. Sorting & Classifying		11. Doing Investigations	✓	17. Communicating	
6. Identifying problems & issues	✓	12. Recording Information			

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 17: Making a musical instrument	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What is a mbira?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

A mbira is a small wooden instrument with wooden keys.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

MY MUSICAL INSTRUMENT DESIGN

Design Brief:

I will design and make a _____.

Specifications:

The musical instrument:

a. must use movement energy to make sound.
b. must be strong so it will not break easily.
c. must be made using recycled materials.
d. must be finished neatly.

Constraints:

The musical instrument must be built in class

2. Read the following case study to the class:

Case Study

Your school would like to develop a music programme for the Grade 2s. Your class has been asked to design and build musical instruments for this class. The instruments will need to make sound by the input of movement energy. These instruments need to be strong, as they will often be played by younger children. They need to be made from recycled materials. The musical instruments must be neatly finished, as they will be used in concerts. The instruments must be made at school.

3. Explain this to the learners as follows:
    a. A design brief is a sentence saying what you are going to design and make.
    b. Learners must complete the design-brief sentence above.
    c. Specifications tell you what the musical instrument must have and be able to do.
    d. Constraints are things you have to do.
4. The learners need to consider the following:
    a. What shape will the musical instrument be?
    b. What materials will you need to make the musical instrument?
5. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What materials can be used?
b. Who are you designing the musical instruments for?

Answers to the checkpoint questions are as follows:

a. Any recyclable materials
b. We are designing the musical instruments for the Grade 2 class.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

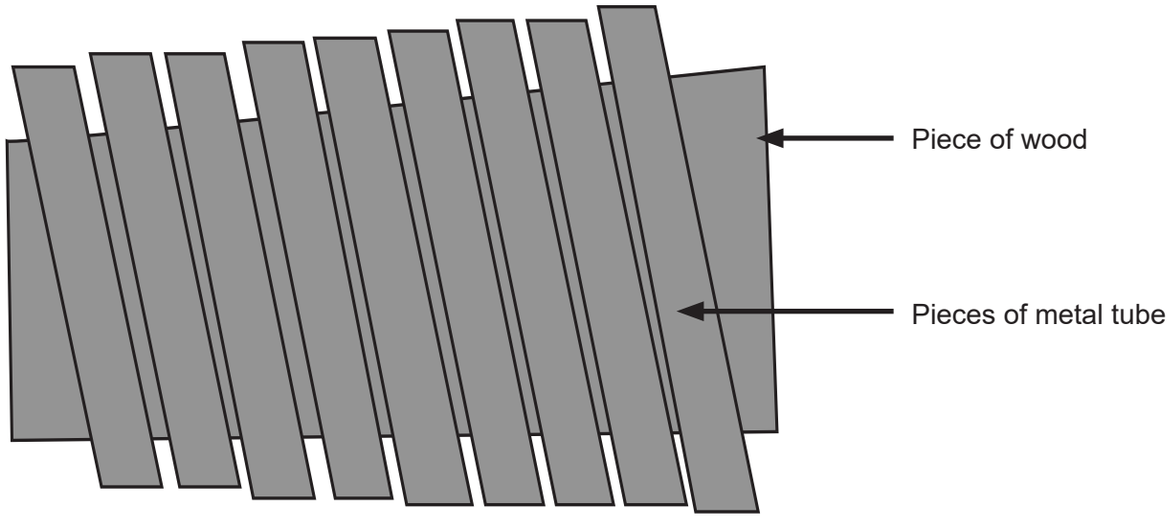
INSTRUCTIONS AND RULES

1. Sketch two different ideas for making a musical instrument.
2. Write notes on the sketch to explain your ideas.
3. Choose your best idea. Can you improve it?
4. Draw your final design.
5. List everything you need to do to make your musical instrument.
6. Always use a sharp pencil.
7. Always write in print on your labels.
8. Use a ruler in the design and for your labels.

2. Read the information on the board to the learners.
    a. Explain to the learners that, before they can design a solution, they need to remember the basic drawing rules.
    b. Tell the learners to copy the instructions and rules into their workbooks.
    c. Tell the learners to do a 2D drawing of their musical instrument.
    d. Remind the learners to add the labels and measurements for their design.
    e. Ask the learners to give their final design a title.
3. Give learners some time to copy the above information from the chalkboard into their workbooks to guide their investigation.
4. Model Answer

MODEL ANSWER

The students can design any instrument of their own choice. The diagram below is just an example.



My Marimba Instrument

4. Ask the learners if they have any questions. Provide answers where necessary.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. How many ideas should you sketch?
b. How many musical instruments will you make?

Answers to the checkpoint questions are as follows:

a. You should sketch two different ideas.
b. You will make only one musical instrument.

5. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Investigate, design, make and evaluate a musical instrument	163-166
Study & Master	Research, design, make and evaluate a musical instrument	116-118
Day by Day	Research, design, make and evaluate a musical instrument	118-119
Platinum	Design and make a musical instrument	134-135
Viva	Design and make a musical instrument	111-116
Spot On	Design and make a musical instrument	71-73
Oxford Successful	Research, design, and make a musical instrument	93-95
Shuter & Shooter	Musical instrument: design and make a solution	96-99
Sasol Inzalo Bk B	Design and make your own musical instrument	43-47

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=fIZPNP3tibw (1min 50sec) [Year 4: Designing and making musical instruments]

7 A

Term 3, Week 7, Lesson A
Lesson Title: Making a musical instrument
Time for lesson: 1½ hours

A POLICY AND OUTCOMES

Sub-Topic	Movement and energy in a system
CAPS Page Number	24

Lesson Objectives

By the end of the lesson, learners will be able to:

- make the best design into a musical instrument
- identify the correct materials to make a musical instrument.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions	✓	13. Interpreting Information	✓
2. Observing	✓	8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	✓
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations	✓	17. Communicating	
6. Identifying problems & issues		12. Recording Information			

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 17: Making a musical instrument	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

Why are you building a musical instrument?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

We are making instruments for a new Grade 2 music programme.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

MY MUSICAL INSTRUMENT

1. Make a list of the tools you will need to make your musical instrument.
2. Make a list of the materials you will need to make your musical instrument. Also list their quantities.
3. Collect your tools and materials.
4. Use your design, and the tools and materials to make your musical instrument.
5. Work carefully and neatly with the tools.

2. Read through the list on the board with the learners to make sure they understand the planning before they start making their musical instruments.
3. Explain this to the learners as follows:
   a. The list on the board is a reminder of the process to be followed.
   b. The design that the learners did in the last lesson should help them to see what they are building.
   c. The learners should work swiftly and neatly.
4. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What two lists will you need in order to make your musical instrument?
b. Why do you need your design to make your musical instrument?

Answers to the checkpoint questions are as follows:

a. You will need a list of tools and a list of materials.
b. You need your design so you know what you are making.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

MAKE A MUSICAL INSTRUMENT

Checklist:

1. Before you start, have you collected all the materials you will need to make your musical instrument?
2. Have you got your design sketch in front of you?
3. Make your musical instrument now.
4. Did you observe the safety rules: no running, no shouting, and holding a pair of scissors downwards when walking?
5. Did you test your musical instrument to see if it needs improvement?
6. Have you put your musical instrument in a safe place for the next lesson?
7. Have you tidied up the area where you worked?

2. Read the information on the board to the learners.
3. Explain this task to the learners as follows:
   a. You will need to make a musical instrument.
   b. Learners must observe safety rules when making their instruments: no running, no shouting, and holding a pair of scissors downwards when walking.
   c. Go through the checklist on the chalkboard.
   d. Tell the learners not to waste materials.
4. Give learners enough time to make and test their musical instruments. Once this has been done, the learners should put their names on their musical instruments and place them in a safe place for evaluation in the next lesson.
5. Give learners some time to copy the above information from the chalkboard into their workbooks to guide their investigation.
6. Ask the learners if they have any questions. Provide answers where necessary.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What do you need to make your musical instrument?
b. What safety rules were you meant to observe?

Answers to the checkpoint questions are as follows:

a. You need your materials, tools and design to make the musical instrument.
b. No running, no shouting, and hold a pair of scissors downwards when walking

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Investigate, design, make and evaluate a musical instrument	163-166
Study & Master	Research, design, make and evaluate a musical instrument	116-118
Day by Day	Research, design, make and evaluate a musical instrument	118-119
Platinum	Design and make a musical instrument	134-135
Viva	Design and make a musical instrument	111-116
Spot On	Design and make a musical instrument	71-73
Oxford Successful	Research, design, and make a musical instrument	93-95
Shuter & Shooter	Musical instrument: design and make a solution	96-99
Sasol Inzalo Bk B	Design and make your own musical instrument	43-47

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=Bka3QGufW2Y (11min 32sec) [Making a reed instrument from a drinking straw]
2. https://www.youtube.com/watch?v=5V_hWBRZKuk (2min 32sec) [Making musical instruments for kids]

7 B

Term 3, Week 7, Lesson B
Lesson Title: Evaluating the musical instrument
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Movement and energy in a system
CAPS Page Number	24

Lesson Objectives

By the end of the lesson, learners will be able to:

- evaluate their musical instrument
- identify the possibilities for improvement in their musical instruments.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	
2. Observing		8. Predicting	✓	14. Designing	
3. Comparing		9. Hypothesizing	✓	15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	✓
5. Sorting & Classifying	✓	11. Doing Investigations		17. Communicating	
6. Identifying problems & issues	✓	12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
-	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

Why do we test our musical instruments?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

We test our musical instruments to see if there any problems that need to be corrected.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

EVALUATION

Copy this table into your workbooks.

	Yes (✓)	**No (x)**
Does my musical instrument use movement energy to make sounds?		
Is it strong?		
Is it made of recycled materials?		
Is it finished neatly?		
Have I only used the materials I was allowed to use?		
Does my model look like my design?		
Did I finish in time?		

2. Read through the table on the board with the learners to make sure they understand the method before they start evaluating their musical instruments.
3. Explain this to the learners as follows:
   a. The table on the board is a reminder of the specifications to be followed when making a musical instrument.
   b. The learners should test their instruments.

c. The learners should work swiftly and neatly.

4. Give learners some time to copy the table from the chalkboard into their workbooks. They should then complete the table.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. Why does the musical instrument need to be strong?
b. Why must the musical instrument be finished neatly?

Answers to the checkpoint questions are as follows:

a. The musical instrument needs to be strong so that it will last.
b. The musical instrument must be finished neatly because they will be used by others, and will be on show.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

SELF-EVALUATION QUESTIONS

1. Does my musical instrument use movement energy to make sounds?
2. Is my musical instrument strong/ not strong enough?
3. Did my musical instrument work well / not work well?
4. What are three ways in which you could improve your musical instrument?
5. Did you tidy up the area where you worked?

2. Read the information on the board to the learners. Ask them to write the questions in their workbooks and complete them.
3. Give learners enough time to do the self-evaluation.
4. Discuss the answers with the learners. Answers will vary according to the instruments and how well/ badly they have been made.
5. Once this has been done, the learners should put their names on their instruments and place them in a safe place, in preparation for taking them home.
6. Ask the learners if they have any questions. Provide answers where necessary.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Why do we evaluate our instruments?
b. Is there still time to fix something that is not working on our instruments?

Answers to the checkpoint questions are as follows:

a. We evaluate our instruments to make sure they work as they are supposed to.
b. Yes, there is still time to fix something not working on an instrument.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Investigate, design, make and evaluate a musical instrument	163-166
Study & Master	Research, design, make and evaluate a musical instrument	116-118
Day by Day	Research, design, make and evaluate a musical instrument	118-119
Platinum	Design and make a musical instrument	134-135
Viva	Design and make a musical instrument	111-116
Spot On	Design and make a musical instrument	71-73
Oxford Successful	Research, design, and make a musical instrument	93-95
Shuter & Shooter	Musical instrument: design and make a solution	96-99
Sasol Inzalo Bk B	Design and make your own musical instrument	43-47

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=D9-U8X_ZF4c (8min 31sec) [Student musical instrument projects]

TOPIC OVERVIEW:
Energy and sound
Term 3, Weeks 7C – 9C

A. TOPIC OVERVIEW

TERM 3, WEEKS 7C – 9C

- This topic runs for 2½ weeks.
- It is presented over 7 lessons.
- This topic counts for 20% in the end-of-year exam.
- This topic's position in the term is as follows:

LESSON	WEEK 1			WEEK 2			WEEK 3			WEEK 4			WEEK 5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

LESSON	WEEK 6			WEEK 7			WEEK 8			WEEK 9			WEEK 10		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

B. SEQUENTIAL TABLE

GRADE 1 & 3	GRADE 4	GRADE 5
LOOKING BACK	**CURRENT**	**LOOKING FORWARD**
• Pollution • What pollution is • Different types of pollution – water, land, air, noise • Effects of pollution on people • Effects of pollution on the environment	• Vibrations and sound • Musical instruments make sounds through vibrations • The sound always moves outwards from the part that is vibrating • We can feel or hear vibrations • Vibrations travel through materials such as air, water, plastic, metal and wood • Making sounds • Sounds can be made loud or soft (volume) • Sounds can be made high or low (pitch) • Noise pollution	• Elastic and springs • We can make things move using stretched or twisted elastic and compressed springs • When we stretch or twist elastic or compress a spring, we store energy in it • When we release the elastic or spring again, we get movement energy

	• Sound that is loud, unpleasant or harmful to our ears and continues for a long time, is described as noise pollution • Noise pollution can cause permanent damage to hearing	

C. SCIENTIFIC AND TECHNOLOGICAL VOCABULARY

Ensure that you teach the following vocabulary at the appropriate place in the topic:

	TERM	EXPLANATION
1.	cochlea	The spiral cavity of the inner ear containing the organ of Corti, which produces nerve impulses in response to sound vibrations
2.	medium	The substance through which sound is transmitted
3.	volume	The quantity or power of sound; how loud or soft something is
4.	pitch	The quality of a sound determined by the rate of vibrations making it – high or low
5.	noise pollution	Harmful or annoying levels of noise
6.	hearing-impaired	Slightly or completely deaf or unable to hear

D. UNDERSTANDING THE USES / VALUE OF SCIENCE

It is important to know and understand how people hear sound. There is a value to understanding that sound is important, but that too much loud sound can cause damage to a person's hearing ability. We need to know how sound can be changed, making it louder or softer, and high or low in pitch.

E. PERSONAL REFLECTION

Reflect on your teaching at the end of each topic:

Date completed:	
Lesson successes:	
Lesson challenges:	
Notes for future improvement:	

7 C

Term 3, Week 7, Lesson C
Lesson Title: Vibrations and Sound
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy and sound
CAPS Page Number	25

Lesson Objectives

By the end of the lesson, learners will be able to:

- identify that the human ear uses vibrations to hear sound
- explain how sound is heard by humans through their ears.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	✓
5. Sorting & Classifying	✓	11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 18: Hearing sounds	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> What were the musical instruments meant to be made from?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

> *The musical instruments were meant to be made with recycled materials.*

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

> HEARING SOUNDS
>
> 1. There are sounds all around us.
> 2. Sounds can be loud or soft.
> 3. Sounds can be high like a whistle blowing or deep and low like a lion's roar.
> 4. The human ear also uses vibration for sound.
> 5. When a stone is thrown into a flat pond, the ripples it causes look exactly like sound waves would look if we could see them.

2. Explain this to the learners as follows:
   a. We need to know that the sounds all around us can be loud or soft, or high or low. These sounds can be heard by people through their ears.
   b. The human ear uses vibrations to hear sound.
   c. Sound vibrations or sound waves, look like the ripples on a pond. They can be close together or further apart.
   d. The ripples are close together, forming the disturbance on the water. They get further apart the more they travel. This is the same for sound.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What sound is deep and low?
b. What part of a human uses vibration for sound?

Answers to the checkpoint questions are as follows:

a. A lion's roar is deep and low.
b. The human ear uses vibration for sound.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

HOW THE EAR WORKS

1. An object vibrates and creates a sound wave.
2. The sound wave travels to the outside of the ear, and then into the ear canal.
3. When the sound reaches the end of the canal, the waves reach the eardrum.
4. The sound waves cause the eardrum to vibrate.
5. The vibration moves tiny bones in the middle of the ear.
6. These bones carry vibrations into the inside of the ear to the shell-shaped bone called the **cochlea**.
7. The cochlea sends the sound to the brain. The brain tells us what sounds we hear.

2. Read the information on the board to the learners..
   a. Explain that this is the way that the ear hears sound. The sound wave caused by the vibration of an object travels to the ear, going into the ear canal.
   b. The sound travels to the end of the ear canal where it meets the eardrum. The sound causes the eardrum to vibrate.
   c. The vibration moves the tiny bones in the ear, which carry the vibrations to the cochlea. The cochlea sends the sound to the brain, which tells us what we are hearing.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. Write the following questions on the chalkboard (always try to this before the lesson starts).
5. After looking at the pictures on Resource 18, tell the learners to answer the questions in their workbooks.

1. Where does sound enter the ear?
2. What is found at the end of the ear canal?
3. What is the shell-shaped bone in the ear called?
4. What does the shell-shaped bone do?

6. Give learners some time to complete this task in their exercise books.
7. Model Answer

MODEL ANSWER

1. *Sound enters the ear canal.*
2. *The eardrum is at the end of the ear canal.*
3. *The shell-shaped bone is called the cochlea.*
4. *The cochlea sends sound to the brain.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What do you need to make your musical instrument?
b. What safety rules were you meant to observe?

Answers to the checkpoint questions are as follows:

a. You need your materials, tools and design to make the musical instrument.
b. No running, no shouting, and hold a pair of scissors downwards when walking

8. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Vibrations and sound	175-180
Study & Master	Vibrations and sound	120-125
Day by Day	Vibrations and sound	123-126
Platinum	Vibrations and sound	138-143
Viva	Vibrations and sound	117-119
Spot On	Vibrations and sound	74-75
Oxford Successful	Vibrations and sound	96-99
Shuter & Shooter	Vibrations and sound	101-105
Sasol Inzalo Bk B	Vibrations and sound	50-59

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=qgdqp-oPb1Q (3min 25sec) [How the ear works]

8 A

Term 3, Week 8, Lesson A
Lesson Title: Hearing and feeling vibrations
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy and sound
CAPS Page Number	25

Lesson Objectives

By the end of the lesson, learners will be able to:

- identify that humans cannot see vibrations, but they can feel and hear them
- explain how sound is created by our vocal cords.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations	✓	16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations	✓	17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 19: Hearing and feeling vibrations	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

Which bone in our ear sends sound to our brain?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

The cochlea sends sound to our brain..

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

HEARING AND FEELING VIBRATIONS

1. We usually cannot see vibrations.
2. People normally hear and feel vibrations.
3. People who are deaf cannot hear through their ears.
4. People who are deaf can feel vibrations in their bodies.
5. People who are deaf can feel the vibrations of music and other sounds.

2. Explain this to the learners as follows:
   a. The sounds all around us can be loud or soft, high or low. These sounds can be heard by people through their ears.
   b. The human ear uses vibrations to hear sound.
   c. Sound vibrations, or sound waves, look like the ripples on a pond. They can be close together or further apart.
   d. The ripples are close together where a disturbance is caused in the water. They get further apart the more they travel. This is the same for sound.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. Can vibrations be heard?
b. How can people who are deaf interpret vibrations?

Answers to the checkpoint questions are as follows:

a. Vibrations can be heard.
b. People who are deaf can feel vibrations in their bodies.

E CONCEPTUAL DEVELOPMENT

1. To do this activity, each group will need the following:
   - A metal spoon, fork or knife
   - 3 glass jars of the same size
   - A container of water
   - A coke bottle or similar
   - A coke can or similar
   - A ruler
2. Ensure you have these materials prepared for each group before the lesson starts.
3. Tell the learners that they are going to be doing an investigation where they will be exploring vibration and sound.
4. Divide the learners into groups so that they all have access to the materials.
5. Write the following onto the chalkboard (always try to do this before the lesson starts):

PRACTICAL TASK

1. This practical task will be done in groups that I have divided you into.
2. Each group will be doing tasks to explore vibration and sound.
3. Each person in the group must participate in the investigation and complete the answers to the written activities in their workbooks.
4. Each group will need the following materials and equipment to do the investigation:
   - A metal spoon, fork or knife
   - 3 glass jars of the same size
   - A container of water
   - A coke bottle or similar
   - A coke can or similar
   - A ruler

6. Read through the practical task with the learners.
7. Remind the learners that in the previous lesson they had learnt about how the ear uses vibrations to hear sound.
8. Tell the learners that today they are going to be investigating some of the properties of vibration.
9. Have each group collect the equipment they will need for the task.
10. The following will need to be written onto the chalkboard:

Task 1: (2 marks)

- Hold a ruler over the edge of the desk so that 20 cm of the ruler is hanging over the edge and the other end it is being held down firmly by another hand on the desk.
- Bend the long edge down towards the floor. DO NOT BREAK IT. Let go. Observe the movement or vibrations.
- Now do the same but have only 5cm of the ruler hanging over the edge of the desk.
- Pull the hanging piece down in the same way and let go.
- Observe the movement or vibrations.
- Answer these questions:

1.1. Which length of ruler vibrated the most?

1.2. What conclusion can you make about vibration from this task?

11. Read through task 1 with the learners.
12. Ask them if they have any questions.
13. Tell the learners they have 5 minutes to complete task 1.
14. Supervise the learners whilst they complete the task and answer any questions they may have.
15. After 5 minutes call the learners back to attention.
16. Tell the learners that they are now going to complete task 2.
17. The following will need to be written on the chalkboard:

Task 2: (4 marks)

- Tap the top of the desk softly with a metal spoon. Listen to the sound.
- Now tap the top of the desk harder with the metal spoon. Listen to the sound.

2.1. Which produced the louder sound?

- Clap your hands softly. Listen to the sound.
- Now clap them hard. Listen to the sound.

2.2. Which produced the louder sound?

2.3. We can conclude that more force was applied the sound was (softer/louder)

2.4. Therefore when more energy is used for a sound it will be_____?

18. Read through task 2 with the learners.

19. Ask them if they have any questions.

20. Tell the learners they have 5 minutes to complete task 2.

21. Supervise the learners whilst they complete the task and answer any questions they may have.

22. After 5 minutes call the learners back to attention.

23. Tell the learners that they are now going to complete a third task.

24. The following will need to be written on the chalkboard:

Task 3: (9 marks)

- Fill the three glass bottles that are the same size with different amounts of water.
- Arrange them from left to right from least amount of water to most amount of water.

3.1. Look carefully at the bottles. Which bottle has the most amount of air space inside for the vibrations to move?

- Now tap each bottle with the metal spoon and listen carefully.

3.2. Which bottle makes the highest sound?

3.3. Which bottle makes the lowest sound?

3.4. What do you think the reason for this is?

- Now empty one of the glass jars.
- Take the coke bottle, the coke can and glass jar.
- Notice which has the widest opening.
- Blow across the edge of each one to try and make a whisteling sound.
- Listen carefully.

3.5. Which produced the highest sound?

3.6. Which produced the lowest sound?

3.7. What do you think the reason for this is?

3.8. What does an object produce when it vibrates?

3.9. What part of the human body processes these vibrations?

25. Read through task 3 with the learners.
26. Ask them if they have any questions.
27. Tell the learners they have 10 minutes to complete task 3.
28. Supervise the learners whilst they complete the task and answer any questions they may have.
29. After 10 minutes call the learners back to attention.
30. Tell the learners to return all equipment and to tidy their work areas.
31. Collect books for assessment.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Vibrations and sound	175-180
Study & Master	Vibrations and sound	120-125
Day by Day	Vibrations and sound	123-126
Platinum	Vibrations and sound	138-143
Viva	Vibrations and sound	117-119
Spot On	Vibrations and sound	74-75
Oxford Successful	Vibrations and sound	96-99
Shuter & Shooter	Vibrations and sound	101-105
Sasol Inzalo Bk B	Vibrations and sound	50-59

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=37csXse35YQ (2min 50sec) [How to see sound: science experiment]

8 B

Term 3, Week 8, Lesson B
Lesson Title:Sound vibrations travel through different materials
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy and sound
CAPS Page Number	25

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain that sound is able to travel through different materials
- explain that the vibrations of the sound move differently through the materials.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	
2. Observing	✓	8. Predicting		14. Designing	
3. Comparing	✓	9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 20.1, 20.2 and 20.3: Sound vibrations travel through different materials	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

How can deaf people sense vibrations?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

Deaf people can feel vibrations by using parts of their bodies such as their hands or feet.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

SOUND VIBRATIONS TRAVEL THROUGH DIFFERENT MATERIALS

1. We know that sound travels through air.
2. We need to know that sound travels through lots of different materials, too.
3. Sound can travel through water, plastic, metal and wood.
4. Sound vibrations travel better through some materials than others.
5. Sound travelling through water will be a little muffled.
6. Whales communicate through sounds which can be heard by other whales very far away.

2. Explain this to the learners as follows:
   a. We need to know that sounds travel through air, and also through certain materials.
   b. The sound vibrations passing through the material will travel differently according to what the material is made of. Wood is a good material for sound to pass through. If you knock on wood, it can be clearly heard. If you knock on wood underwater, it will not be clearly heard.
   c. The material lets the vibrations continue through it at the same frequency or they sow down.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. Can sound travel through wood?
b. What happens to sound when it travels through water?

Answers to the checkpoint questions are as follows:

a. Sound can travel through wood.
b. When sound travels through water, it becomes muffled.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

SOUND AND A MEDIUM

1. Vibrations pass energy to other things.
2. Sound energy from vibrating objects creates waves that move through a **medium**.
3. A medium could be a gas (air), a liquid (water), or a solid (a wooden desk).
4. The vibrations pass the sound energy from the vibrating object to the medium.
5. The energy then travels from the medium to our ears.

2. Read the information on the board to the learners, and ask them to copy it into their workbooks.
   a. Explain that sound is able to pass through things.
   b. These things are called mediums. A medium is a substance or item that allows sound to be transferred through it.
   c. The vibrations move the sound energy to the medium, which then transfers the sound energy to our ears.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. Show the learners the pictures on Resource 20.1, 20.2 and 20.3, and explain to them that in picture 3, a Tibetan woman is playing what is called a singing bowl. This bowl is made of a few different metals. When she moves the wooden handle around the top of the bowl, the metals vibrate against each other and a sound is made.
5. Tell the learners to copy these questions down into their book and answer them:

ACTIVITY

1. What are the three mediums that sound can pass through?
2. What mammal makes sounds that can travel very far underwater?
3. Does metal vibrate and so pass on sound?

6. Give learners some time to complete this task in their exercise books.
7. Model Answer

MODEL ANSWER

1. *Sound can pass through a gas, a liquid and a solid.*
2. *A whale makes sounds that can travel very far underwater.*
3. *Metal does vibrate and so passes on sound.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What do vibrating objects create that move through a medium?
b. What is a medium?

Answers to the checkpoint questions are as follows:

a. Vibrating objects create waves that move through a medium.
b. A medium is a material that sound can travel through.

8. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Vibrations and sound	175-180
Study & Master	Vibrations and sound	120-125
Day by Day	Vibrations and sound	123-126
Platinum	Vibrations and sound	138-143
Viva	Vibrations and sound	117-119
Spot On	Vibrations and sound	74-75
Oxford Successful	Vibrations and sound	96-99
Shuter & Shooter	Vibrations and sound	101-105
Sasol Inzalo Bk B	Vibrations and sound	50-59

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=q9ezMbDpIHI (4min 11sec) [How sound travels through different media]

8 C

Term 3, Week 8, Lesson C
Lesson Title: Making sounds - volume
Time for lesson: 1½ hours

A POLICY AND OUTCOMES

Sub-Topic	Energy and sound
CAPS Page Number	25

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain what volume means
- explain how volume can be changed and how sound changes.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	
2. Observing	✓	8. Predicting		14. Designing	
3. Comparing	✓	9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations	✓	17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 21: Making sounds - volume	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

Which medium does sound not travel well through?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

Sound does not travel well through liquid.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

MAKING SOUNDS – VOLUME

1. Different musical instruments make different sounds.
2. Some instruments are very loud, some instruments are very soft.
3. The differences in sounds are called volume and pitch.
4. Volume is how loud or soft a sound is.
5. A whisper is a soft sound and the volume is low.
6. A shout is a loud sound and the volume is high.

2. Explain this to the learners as follows:
   a. We need to know that instruments make different sounds. There are loud sounds and soft sounds. The difference between loud and soft is volume.
   b. If you whisper, it is soft and the volume is low.
   c. If you shout at the top of your voice, it is loud and the volume is high.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What do you call the differences in the sound of instruments?
b. What sort of sound is made by the crash of two cars?

Answers to the checkpoint questions are as follows:

a. The differences in sound are called volume and pitch.
b. The sound of the crash of two cars is a loud sound, and the volume is high.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

MAKING SOUND LOUDER OR SOFTER

1. On a television or radio, we turn up the volume to make it louder, or turn down the volume to make it softer.
2. The instruments that make loud sounds have similar shapes and are usually thicker and big.
3. The instruments that make soft sounds have similar shapes and are usually thin and small.
4. Small vibrations cause soft sounds.
5. Big vibrations cause loud sounds.

2. Read the information on the board to the learners, and ask them to copy it into their workbooks.
   a. Explain that sound can be changed from a soft sound to a loud sound. When you are watching television, or listening to the radio, the sound can be changed by turning the volume up if it is soft, or down if it is loud.
   b. Musical instruments make different sounds. This is due to their shape and size.
   c. A big instrument will produce big vibrations which make loud sounds.
   d. A small instrument will produce small vibrations which make soft sounds.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. Show the learners the pictures on Resource 21, and tell the learners to copy these questions down into their book and answer them:

ACTIVITY

1. What instrument will make a loud sound?
2. What instrument will make a soft sound?
3. Why is there a difference between the sounds that big instruments and small instruments make?
4. What instrument could you draw that would make a loud sound?
5. What instrument could you draw that would make a soft sound?

5. Give learners some time to complete this task in their exercise books.
6. Model Answer

MODEL ANSWER

1. *A large instrument will make a loud sound.*
2. *A small instrument will make a soft sound.*
3. *Big instruments produce big vibrations and small instruments produce small vibrations. Big vibrations make loud sounds and small vibrations make soft sounds.*
4. *The learners could draw a drum, a cello, or any instrument with a big body.*
5. *The learners could draw a flute, a triangle, or any instrument with a small body.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. How do you make the sound louder on a television?
b. What sort of vibrations cause a loud sound?

Answers to the checkpoint questions are as follows:

a. To make the sound louder on a television, we turn the sound up.
b. Big vibrations cause loud sounds.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Making sounds	181-185
Study & Master	Making sounds	126-127
Day by Day	Making sounds	127-130
Platinum	Making sounds	144-147
Viva	Making sounds	120-122
Spot On	Making sounds	76-79
Oxford Successful	Making sounds	100-102
Shuter & Shooter	Making sounds	105-107
Sasol Inzalo Bk B	Making sounds	60-67

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=VYMRRaKMntY (6min 39sec) [How to teach sound and pitch]

9 A

Term 3, Week 9, Lesson A
Lesson Title: Making sounds - pitch
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy and sound
CAPS Page Number	25

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain what pitch means
- explain how pitch can be changed and how sound changes.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	✓
3. Comparing	✓	9. Hypothesizing		15. Making/ constructing	
4. Measuring	✓	10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 22: Making sounds - pitch	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What is volume?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

Volume is the loudness of a sound.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

MAKING SOUNDS – PITCH

1. Sounds can be made high or low.
2. This is called the pitch of the sound.
3. A mouse squeak is a high sound.
4. An elephant rumble is a very low sound.
5. A high sound is made with fast vibrations.
6. A low sound is made with slow vibrations.

2. Explain this to the learners as follows:
   a. We need to know that instruments make different sounds. In addition to loud and soft sounds, there are high sounds and low sounds. The difference between high and low is pitch.
   b. If a rat squeaks, it is a high sound.
   c. If a lion roars, it is a low sound.
   d. A high sound has many vibrations and a low sound only has a few vibrations.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What is the pitch of a sound?
b. What sort of sound is a lion's roar?

Answers to the checkpoint questions are as follows:

a. The pitch of a sound is how high or low it can go.
b. A lion's roar is a low sound.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

PITCH AFFECTED BY SHAPE AND SIZE

1. Pitch is the measure of how high or how low a sound is.
2. On string instruments, tighter strings play higher notes, and looser strings play lower notes.
3. The shape of an instrument also affects the pitch of the sound it makes.
4. A flute has a small body and so will make high sounds.
5. A tuba has a wide body and so will make low sounds.
6. People cannot hear all sounds. Some sounds are so high, like a dog whistle, that we cannot hear it.
7. Some sounds a so low we cannot hear them.

2. Read the information on the board to the learners, and ask them to copy it into their workbooks.
   a. Explain that pitch is the measure of how high or low a sound is.
   b. Tight strings on a violin or guitar will produce many vibrations and this will produce a high sound.
   c. If an instrument has a small body, it will produce many vibrations and a high sound. Similarly, a large bodied instrument will produce few vibrations and so a lower sound.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. Show the learners the pictures on Resource 21, and tell the learners to copy these questions down into their book and answer them:

ACTIVITY

1. Draw a picture of the sound wave of a high-pitched sound.
2. Draw a picture of the sound wave of a low-pitched sound.
3. What is the difference between the wave for a high-pitched sound and a low-pitched sound?

5. Give learners some time to complete this task in their exercise books.
6. Model Answer

MODEL ANSWER

1. *This picture will look like the top wave on Resource 22.*
2. *This picture will look like the bottom wave on Resource 22.*
3. *In the high-pitched wave you are able to see the many vibrations that are created. A low-pitched sound does not have as many vibrations.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What is pitch?
b. What sort of sounds will a big drum make?

Answers to the checkpoint questions are as follows:

a. Pitch is the measure of how high or how low a sound is.
b. A big drum will make low sounds.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Making sounds	181-185
Study & Master	Making sounds	126-127
Day by Day	Making sounds	127-130
Platinum	Making sounds	144-147
Viva	Making sounds	120-122
Spot On	Making sounds	76-79
Oxford Successful	Making sounds	100-102
Shuter & Shooter	Making sounds	105-107
Sasol Inzalo Bk B	Making sounds	60-67

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=yMLTF_0PAQw (2min 32sec) [Sound waves: high pitch and low pitch]

9 B

Term 3, Week 9, Lesson B
Lesson Title: Noise pollution
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Energy and sound
CAPS Page Number	25

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain what noise pollution is
- explain how noise pollution can affect the well-being of people.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions	✓	13. Interpreting Information	✓
2. Observing	✓	8. Predicting	✓	14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 23: Noise pollution	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What is pitch?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

Pitch is the measure of how high or how low a sound is.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

NOISE POLLUTION

1. Noise is any unwanted sound.
2. If loud, unpleasant or harmful sounds carry on for a long time, it is called **noise pollution.**
3. Most noise pollution comes from machines, tools, and vehicles.
4. Volume is measured in decibels (dB).
5. If people are frequently around sounds louder than 85dB, then their hearing might get damaged.
6. In factories with loud machines, workers must wear ear protectors to protect their hearing.

2. Explain this to the learners as follows:
   a. We need to know that noise is any unwanted sound.
   b. When unwanted sound is repetitive, it becomes noise pollution.
   c. Machinery and tools are the main causes of noise pollution, but animals and people can also cause noise pollution. Dogs barking all night can be very annoying.
   d. Factory workers often need to wear ear protection, because the machines run continually and can be very loud.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What is noise?
b. What is volume measured in?

Answers to the checkpoint questions are as follows:

a. Noise is any unwanted sound.
b. Volume is measured in decibels.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

LOSS OF HEARING

1. If a person hears a sound louder than 130dB, their hearing will be damaged straight away.
2. Hearing loss caused by a loud noise will not get better.
3. Someone who has a hearing loss is **hearing-impaired**.
4. Someone who is hearing-impaired can use a hearing aid to hear more clearly.
5. A hearing aid makes sounds easier to hear.
6. As people get older they sometimes cannot hear the full range of pitches anymore.

2. Read the information on the board to the learners, and ask them to copy it into their workbooks.
   a. Explain that loss of hearing is very serious for people. Everyone wants to be able to hear clearly.
   b. Someone who has hearing loss of any kind, is hearing-impaired. This might not mean they are completely deaf, but they might not be able to hear certain sounds.
   c. As people get older, the range of sounds they can hear becomes less.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. Show the learners the pictures on Resource 23 which detail the effects of noise pollution on people.
5. Tell the learners to copy the following questions into their workbooks and answer them:

ACTIVITY

1. If someone is hearing-impaired, are they deaf?
2. What is a hearing aid?
3. If you sit quietly for five minutes, what loud sounds can you hear?
4. What annoying sounds can you hear from outside the classroom?

6. Give learners some time to complete this task in their exercise books.
7. Model Answer

MODEL ANSWER

1. *Someone who is hearing-impaired might not be able to hear certain sounds, but might not be completely deaf.*
2. *A hearing aid is a device that allows hearing-impaired people or deaf people to hear sounds they were previously not able to.*
3. *The learners should list the sounds they hear as they sit quietly in the classroom.*
4. *The learners should list the annoying sounds they can hear coming from the outside of the classroom.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. How many decibels will ruin a person's hearing?
b. What could a hearing-impaired person use to hear sounds more clearly?

Answers to the checkpoint questions are as follows:

a. 130 decibels will ruin a person's hearing.
b. A hearing-impaired person could use a hearing aid.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Noise pollution	185-189
Study & Master	Noise pollution	128-129
Day by Day	Noise pollution	131-133
Platinum	Noise pollution	148-149
Viva	Noise pollution	122-123
Spot On	Noise pollution	80-81
Oxford Successful	Noise pollution	103-106
Shuter & Shooter	Noise pollution	108-111
Sasol Inzalo Bk B	Noise pollution	68-72

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=O1-W7gz6Znk (1min 15sec) [What is noise pollution]
2. https://www.youtube.com/watch?v=DdImG-jphkM (4min 45) [Noise pollution]

9 C

Term 3, Week 9, Lesson C
Lesson Title: Case Study
Time for lesson: 1½ hours

A POLICY AND OUTCOMES

Sub-Topic	Energy and sound
CAPS Page Number	25

Lesson Objectives

By the end of the lesson, learners will be able to:

- identify solutions for noise pollution
- discuss the problems noise pollution causes in society.

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	✓

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing	✓	15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
-	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What is noise pollution?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss their answers with the learners.
5. Write the model answer onto the chalkboard.

Loud, harmful and unpleasant sounds which occur frequently.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

WHO DEALS WITH NOISE POLLUTION?

1. Noise can cause serious problems.
2. There have been cases in South Africa where many people have complained to municipalities about ongoing noise pollution.
3. This uses up valuable time for investigators who look into the causes.
4. Investigations also cost money.
5. Many people do not realise or care that they are causing noise pollution.
6. More awareness and respect for others is needed.

2. Explain this to the learners as follows:
   a. We need to know that noise pollution is a real problem in South Africa.
   b. There are many different sources of noise pollution. Examples are: factories that run all day and all night, airplanes that fly low over people's houses, the noise of cars and trucks driving with loud engines, the noise of lots of people in a small space, the noise of dogs barking without being checked by their owners.
   c. When unwanted sound is repetitive, it becomes noise pollution.
3. Give learners some time to copy the above information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. Why does noise pollution need to be investigated?
b. Why do investigations cost money?

Answers to the checkpoint questions are as follows:

a. Noise pollution needs to be investigated to find out the causes and to prevent it from happening.
b. They cost money because the investigators have to be paid.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

CASE STUDY

1. In towns and cities there are many dogs.
2. Dogs are often left outside at night.
3. Dogs will bark if they feel uncomfortable or they are protecting something.
4. Dogs also bark to communicate with each other.
5. Often people do not check their dogs at night and let them bark.
6. This barking can be very annoying to people trying to sleep.

2. Read the case study to the learners.

CASE STUDY

Complaints about barking dogs are coming in from all parts of Johannesburg. The complaints come from people who are tired of dogs being allowed to bark for long periods of time throughout the night. Complainants have said that they are unable to get a good night's sleep, and that they are often very tired in the day which is affecting their ability to work. They are becoming stressed at home. This leads them to quarrel with their family, and people around them.

3. Read the information on the board to the learners, and ask them to copy it into their workbooks.
   a. Explain that cities have to manage the health and well-being of their people. This is done by investigating the complaints of people who experience factors affecting their health.
   b. Read the paragraph to the learners.
4. Ask the learners if they have any questions. Provide answers where necessary.
5. Tell the learners to copy the following task into their workbooks and to complete it:

TASK

Write your own letter of complaint to your local municipality. Explain the problem you are experiencing with the noise in your neighbourhood because of the dogs that are being left to bark unchecked through the night. Remember you have the right to complain about the noise. You need not include addresses or dates, but you should put in a contact number.

You will need to mention:

- The source of the noise pollution in your area
- Why the noise is irritating
- In what way is it harmful to you
- How the situation could be improved.

7. Give learners some time to complete this task in their exercise books.
8. Possible Model Answer

Dear Councillor Sithole

Please will you ask someone to investigate the continuous barking of dogs in our neighbourhood at night. We live in Thembisa. Every night the dogs are left to bark and bark. No-one seems to check them or keep them quiet. The noise is irritating because it occurs throughout the night. It has become harmful to us because we have not been able to get a good night's sleep in a long time. We have become stressed because we are quarrelling amongst ourselves due to lack of sleep. We have not been able to do our jobs properly because we are too tired. I would suggest that the municipality makes a rule where all dog owners must put their dogs inside their houses at night.

Thank you

Duduzile Khoza

011 698 5670 / 072 456 9871

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Why do dogs bark at night?
b. What affect does this have on people around them?

Answers to the checkpoint questions are as follows:

a. Dogs bark at night if they are uncomfortable, protecting something or communicating with other dogs.
b. People might not be able to sleep and so could be very tired.

9. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Noise pollution	185-189
Study & Master	Noise pollution	128-129
Day by Day	Noise pollution	131-133
Platinum	Noise pollution	148-149
Viva	Noise pollution	122-123
Spot On	Noise pollution	80-81
Oxford Successful	Noise pollution	103-106
Shuter & Shooter	Noise pollution	108-111
Sasol Inzalo Bk B	Noise pollution	68-72

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=ilFeoUVDFvU (1min 12sec) [Ocean Noise Pollution]

NATURAL SCIENCES & TECHNOLOGY

ASSESSMENT GRADE 4 TERM 3

GRADE 4 ASSESSMENT

- This section presents the CAPS assessment requirements for this grade for this term.
- See your prescribed textbooks for examples of the required assessments.

CAPS Assessment

Assessment is a continuous planned process that involves identifying, gathering, interpreting and diagnosing information about the performance of learners.

Assessment involves generating and collecting evidence of learner achievement and progress, and using this information to understand and provide assistance to the learner during the process of teaching and learning.

Assessment should be both *formal* and *informal*:

a. ***Informal Assessment*** involves regular checking of learners' class work and practical tasks; asking questions; discussions; informal classroom interactions; and giving constructive feedback. Informal assessment marks do not need to be recorded, but the teacher can make notes for future reference.

b. ***Formal Assessment*** provides teachers with a systematic way of evaluating how well learners are progressing. Formal Assessment consists of selected assessment tasks. These tasks are stipulated by CAPS and the marks need to be recorded. These tasks are done throughout the year, and include practical tasks, tests and examinations.

   i. ***Tests and Examinations***

      Examinations must include questions on both Natural Sciences and Technology. The weighting of the marks should reflect the time allocated to each section in the curriculum content. Tests and exams should consist of a range of questions that cover different cognitive levels: recall; understanding; application; evaluation; analysis; and synthesis. CAPS aligned tests and examinations, with accompanying memoranda, are provided with these lesson plans.

   ii. ***Practical Tasks***

      Practical tasks give learners the opportunity to demonstrate knowledge, skills and understanding. Practical tasks form part of the activities included in these lesson plans. Each term, one practical task has been selected for assessment. A rubric is provided to conduct the assessment.

A minimum mark allocation is prescribed in CAPS for tests, practical tasks and examinations for each grade. For this grade, these are summarised in the table below:

GRADE 4 ASSESSMENT

Grade 4						
Programme of Formal Assessment						
Formal Asessments	**TERM 1**	**TERM 2**	**TERM 3**	**TERM 4**	**TOTAL MARKS FOR THE YEAR**	**TOTAL**
School-based assessments	1 test [15 marks] 1 selected practical task [10 marks]	1 exam or test on work from terms 1 & 2 [40 marks] 1 selected practical task [10 marks]	1 test [15 marks] 1 selected practical task [15 marks]	1 selected practical task [15 marks]	120 marks	Together make up 75% of the total marks of the year
Exams [60 minutes]				Exam on work from terms 3 & 4 [40 marks]	40 marks	Makes up 25% of the total marks of the year
Number of formal assessments	2	2	2	2	Total 8 assessments [160 marks]	Total: 100%

Refer to CAPS on the processes for converting marks to percentages and to the 7-point scale.

In this section of the booklet, you will find your science assessments for this term.

There are two assessments included:

A Practical Activity

The activity completed is drawn from one of the lessons in the lesson plans. The rubric or memorandum attached in this pack will assist you with assessing the task completed by the learners.

A Test

The test included will need to be copied onto the chalkboard for learners to complete. There is also a test memorandum included to assist you with marking the learners completed test scripts.

All of the assessments are aligned to CAPS requirements and the marks allocated for each assessment are as stipulated in CAPS.

Natural Sciences & Technology
Grade 4
Practical Task
Term 3

Time: 40 minutes (20 minutes preparation, 20 minutes task time)
Marks: 15

NOTES TO THE TEACHER

1. This practical activity will be completed as part of Section E of lesson 8A.
2. This practical will take place during the lesson after the teaching component in Section D, "Accessing Information".
3. The first 20 minutes will be used to teach section D and prepare learners for the practical task.
4. The second 20 minutes will be used to complete the practical activity as outlined in Section E.
5. The instructions and content of the practical task should be written on the chalkboard for the learners.
6. The memo for assessing the practical task is provided.
7. The learners will be working in groups and will need the following items for each group to complete the tasks:
    - A metal spoon, fork or knife
    - 3 glass jars of the same size
    - A container of water
    - A coke bottle or similar
    - A coke can or similar
    - A ruler
8. Another option is to set up one of each experiment and have the learners move in groups from one to another. This will take some organisation on the part of the educator.
9. Ensure that all the materials have been collected before the practical lesson. This may take a few days. Allow enough time for this.
10. The learners should complete the drawings with a sharp pencil and the written answers should be completed in pen.

Grade 4
Natural Sciences & Technology
Term 3
Practical Task

Memorandum

(see Section E of Lesson 8A for instructions and questions)

CAPS Topic	Task	Expected answer/outcome	Marks
	1		
Energy and Sound	1.1	The longer length. ✓	1
Energy and Sound	1.2	The longer the object the longer and further it vibrates. ✓	1
	2		
Energy and Sound	2.1	When the desk was tapped harder. ✓	1
Energy and Sound	2.2	When the hands were clapped harder. ✓	1
Energy and Sound	2.3	Louder ✓	1
Energy and Sound	2.4	Louder ✓	1
	3		
Energy and Sound	3.1	The one on the left (Least amount of water). ✓	1
Energy and Sound	3.2	The one on the left (Least amount of water). ✓	1
Energy and Sound	3.3	The one on the right (Most amount of water). ✓	1
Energy and Sound	3.4	Answers will vary, e.g.: More space for vibration ✓	1
Energy and Sound	3.5	Answer will vary depending on glass jars used for previous task. ✓	1
Energy and Sound	3.6	Answer will vary depending on glass jars used for previous task. ✓	1
Energy and Sound	3.7	Answers will vary, e.g.: ✓ • Size of container • Shape of container • Material used to make container – steel, plastic, aluminium, etc.	1
Energy and Sound	3.8	Sound waves ✓	1
Energy and Sound	3.9	Ears ✓	1
			TOTAL 15

Grade 4
Natural Sciences & Technology
Term 3
Test

15 Marks
30 Minutes

NOTE TO THE TEACHER:

If possible, photocopy this test for each learner. If this is not possible, write the test on the chalkboard.

INSTRUCTIONS TO THE LEARNERS

1. Answer all questions in blue or black ink.
2. Read each question carefully before answering it.
3. Pay attention to the mark allocations.
4. Plan your time carefully.
5. Write your answers in the spaces provided.
6. Write neatly.

PRACTICE QUESTION

Read the question and circle the letter that shows the correct answer.

1.1. Which of the following is a source of energy for plants?

a. water

b. sunlight

c. wind

d. rain

You have answered correctly if you have circled (B)

GRADE 4 ASSESSMENT – TEST TERM 3

QUESTION 1: MULTIPLE CHOICE [3]

Read each question and circle the letter that shows the correct answer.

1.1. Which Sun provides us with two kinds of heat. These are:

a. light and plants

b. light and glucose

c. heat and light

d. glucose and heat

1.2. Which of these statements is FALSE?

a. In a food chain, arrows are used to show the direction of the energy flow.

b. Food chains can link up to form a food web.

c. Light is not a form of energy.

d. Heat is energy we can feel.

1.3. When we burn wood, the energy in the wood is transferred into:

a. light and heat

b. ash and coal

c. heat and smoke

d. smoke and steam

QUESTION 2 [4]

Write one word that means the same as the sentence:

2.1. Electricity that is made by the movement of water.

_____

2.2. A unit for measuring the loudness of sounds.

_____

2.3. The measure of the warmth of coldness of an object or a place.

_____

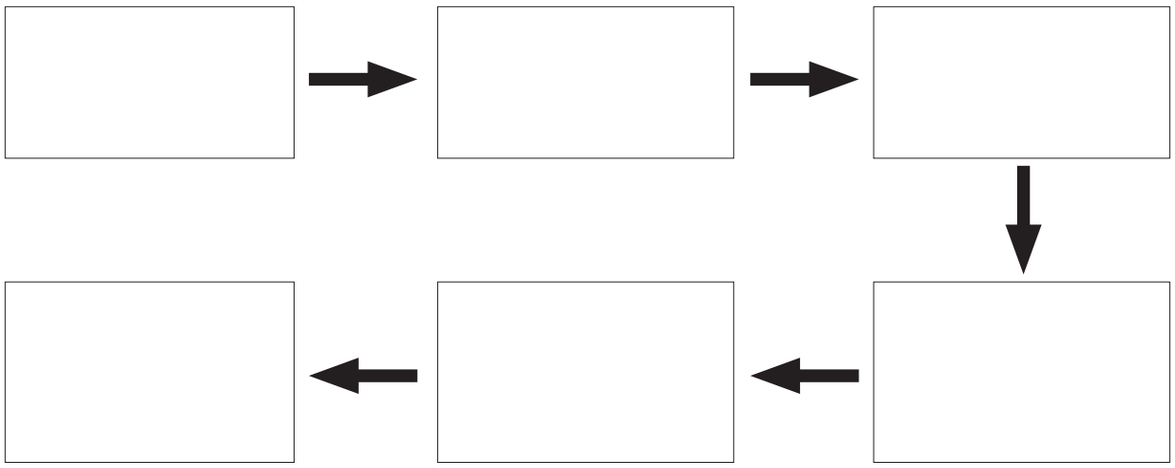
2.4. Energy that we can hear.

_____

QUESTION 3 [5]

Explain, using a flow diagram (and including the words below) how energy might be transferred from the sun to the movement of a soccer ball.

Sun, light, heat, plants, energy, transfer, animals, herbivore, person, eat, kick



QUESTION 4 [3]

Using a wood fire as an example, explain what input energy and output energy means.

_____

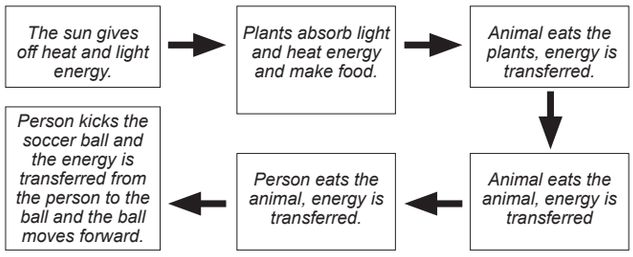
_____

_____

[Total: 15]

Grade 4
Natural Sciences & Technology
Term 3
Test

Memorandum

CAPS Topic	Questions	Expected answer(s)	Marks
	1		
Energy and Energy Transfer	1.1	C ✓	1
Energy and Energy Transfer	1.2	C ✓	1
Energy around us	1.3	A ✓	1
	2.		
Energy around us	2.1	hydroelectric energy ✓	1
Energy and Sound	2.2	decibel(s) ✓	1
Energy and change, Systems and Control	2.3	temperature ✓	1
Energy and Sound	2.4	sound ✓	1
	3.		
Energy around us	3	 (Any 5) ✓ ✓ ✓ ✓ ✓	5
	4.		
Energy around us	4	• The wood is the input. • The heat is the output. • The more input energy there is, the more output energy there will be (more wood, means more heat). • Fire is the process that turns the input energy into heat (Any 3) ✓ ✓ ✓	3
			TOTAL 15