

## 2023/24 ANNUAL TEACHING PLANS: NATURAL SCIENCES AND TECHNOLOGY: GRADE 6 (TERM 1)

TERM 1	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11		
<b>CAPS TOPICS</b>	<b>Life and living &amp; Processing</b>												
	<b>Photosynthesis</b>		<b>Nutrients in food</b>		<b>Nutrition</b>		<b>Ecosystems and food webs</b>			<b>Remediation, revision and consolidation</b>			
<b>CORE CONCEPTS, SKILLS AND VALUES</b>	<ul style="list-style-type: none"> <li>Plants and food</li> <li>Plants and air</li> </ul>		<ul style="list-style-type: none"> <li>Food Groups</li> </ul>		<ul style="list-style-type: none"> <li>Balanced diets</li> </ul>		<ul style="list-style-type: none"> <li>Different ecosystems</li> <li>Living and non-living things in ecosystems.</li> </ul>						
<b>REQUISITE PRE-KNOWLEDGE</b>	<ul style="list-style-type: none"> <li>Grade 4: Life processes; Energy and energy transfer</li> <li>Grade 5: Food chains; Life cycles</li> </ul>												
<b>RESOURCES (other than textbook) TO ENHANCE LEARNING</b>	<ul style="list-style-type: none"> <li>Glucose powder, maize flour, iodine solution and plastic droppers</li> <li>Examples of foods, such as cooked rice, flour, potato, bread, oil, boiled egg and cheese</li> <li>Video clips from the internet</li> </ul>		<ul style="list-style-type: none"> <li>Examples of different foods representing the different food groups</li> <li>Food packaging</li> </ul>		<ul style="list-style-type: none"> <li>Lists of different diets</li> <li>Pictures and information about food-related illnesses</li> </ul>		<ul style="list-style-type: none"> <li>Pictures of ecosystems such as rivers, mountains, the sea, rocky shores, ponds, wetlands, grasslands, forests and deserts</li> </ul>						
<b>INFORMAL ASSESSMENT</b>	<ul style="list-style-type: none"> <li>Explain and illustrate how plants make food</li> <li>Compare glucose sugar (such as glucose sweets) and starch (such as maize flour) according to their taste and colour</li> <li>Test various foods for the presence of starch with iodine solution (e.g. cooked rice, flour, potato, bread, oil, boiled egg, cheese, etc.)</li> </ul>		<ul style="list-style-type: none"> <li>Classifying food into the different food groups, namely carbohydrates, proteins, fats and oils and vitamins and minerals</li> <li>State reasons why each food group is important in our diet</li> <li>Read labels on food packaging to look for the nutrients and/or the additives in the food</li> <li>Explain whether each of the additives make these products more or less healthy to eat</li> <li>Carefully study various diets to evaluate if they contain all the food groups/whether they are a balanced diet</li> <li>Explain why different portions of the different food groups are necessary for a balanced diet</li> <li>Discuss various diseases caused by an unhealthy diet, such as tooth decay, obesity, diabetes or deficiency diseases</li> </ul>				<ul style="list-style-type: none"> <li>Describe different types of ecosystems on our planet</li> <li>Identify an ecosystem, describe it and draw the feeding relationships (food webs) within it</li> <li>Investigate an ecosystem in or near the school grounds. Mark out the area with sticks and string using the quadrant method, ensuring that you do not damage any of the plants or animals</li> <li>Study both the living and non-living things within the ecosystem</li> <li>Identify the possible threats to this ecosystem and possible ways to overcome them</li> </ul>						
<b>SBA (FORMAL ASSESSMENT)</b>	<ul style="list-style-type: none"> <li>Practical task/investigation</li> <li>Test</li> </ul>												

## 2023/24 ANNUAL TEACHING PLANS: NATURAL SCIENCES AND TECHNOLOGY: GRADE 6 (TERM 2)

TERM 2	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10 AND 11
<b>CAPS TOPICS</b>	<b>Matter and materials &amp; Processing</b>									
	<b>Solids, Liquids and gases</b>	<b>Mixtures</b>	<b>Solutions as special mixtures</b>	<b>Dissolving</b>	<b>Mixtures and water resources</b>	<b>Processes to purify water</b>	<b>Remediation, revision and consolidation</b>			
<b>CORE CONCEPTS, SKILLS AND VALUES</b>	<ul style="list-style-type: none"> <li>Arrangement of particles</li> </ul>	<ul style="list-style-type: none"> <li>Mixtures of materials</li> </ul>	<ul style="list-style-type: none"> <li>Solutions</li> <li>Soluble substances</li> <li>Saturated solutions</li> <li>Insoluble substances</li> </ul>	<ul style="list-style-type: none"> <li>Rates of dissolving</li> </ul>	<ul style="list-style-type: none"> <li>Water pollution</li> <li>Importance of wetlands</li> </ul>	<ul style="list-style-type: none"> <li>Clean water</li> </ul>				
<b>REQUISITE PRE-KNOWLEDGE</b>	<ul style="list-style-type: none"> <li>Grade 4: Materials around us; Solid materials</li> <li>Grade 5: Processed materials</li> </ul>									
<b>RESOURCES (other than textbook) TO ENHANCE LEARNING</b>	<ul style="list-style-type: none"> <li>Video clips from the internet</li> </ul>	<ul style="list-style-type: none"> <li>Video clips from the internet</li> <li>Examples of materials and substances, such as salt, sand, sugar, tea leaves, peanuts, dried beans, coins, sweets, curry powder, grated cheese, milk, oil</li> </ul>	<ul style="list-style-type: none"> <li>Video clips from the internet</li> <li>Examples of materials and substances such as salt, sugar, sand, mealie meal, flour, maize flour, samp, curry powder, custard powder</li> <li>Measuring cylinders, funnels, filter paper, beakers, evaporating dish, salt, food colouring</li> </ul>	<ul style="list-style-type: none"> <li>Glass beakers/small yoghurt tubs/clear containers, a stopwatch or clock with a second hand, thermometers, measuring spoons, ice cream sticks, salt (coarse and fine)</li> <li>Video clips from the internet</li> </ul>	<ul style="list-style-type: none"> <li>Texts for reading about water pollution</li> <li>Video clips from the internet</li> <li>Pictures of different kinds of polluted water</li> <li>Sources about, and pictures of, different wetlands</li> </ul>	<ul style="list-style-type: none"> <li>Sieves, filter paper, funnels, containers, a kettle and water purification tablets (if possible)</li> </ul>				
<b>INFORMAL ASSESSMENT</b>	<ul style="list-style-type: none"> <li>Draw and explain how particles are arranged in a solid, liquid and gas</li> <li>Identify the three states of matter in everyday life</li> <li>Describe solids, liquids and gases in terms of the arrangement of their particles</li> </ul>	<ul style="list-style-type: none"> <li>Explain and demonstrate the different ways in which solids, liquids and gases can be combined to form mixtures</li> <li>Explain and demonstrate the different ways in which mixtures can be separated, such as sieving, filtering, hand sorting, settling and decanting</li> <li>Investigate different solids to see whether they dissolve in water, including salt and sugar (soluble substances) as well as sand, mealie meal, flour, maize flour, samp, curry powder and custard powder (insoluble substances)</li> <li>Investigate solutions to see whether we can recover the solute by filtering or settling followed by decanting, or evaporating the water (crystallisation)</li> <li>Investigate and make sugar crystals</li> <li>Explain different kinds of mixtures (including solutions)</li> <li>Distinguish between soluble and insoluble substances</li> <li>Recover the solute from the solvent and draw and write about the process</li> </ul>	<ul style="list-style-type: none"> <li>Investigate the difference between melting and dissolving</li> <li>Investigate, measure and draw graphs of the time taken to dissolve a solute <ul style="list-style-type: none"> <li>in hot or cold water</li> <li>when stirring/shaking or not, and</li> <li>using coarse or fine salt</li> </ul> </li> <li>Tell what factors affect the rate of dissolving</li> </ul>	<ul style="list-style-type: none"> <li>Discuss pollution and where it comes from.</li> <li>Identify three main categories of pollutants found in water and explain how you think they entered/ended up in the water.</li> <li>Explain why wetlands are so important</li> <li>Research the different wetlands in South Africa</li> </ul>	<ul style="list-style-type: none"> <li>Design, make and evaluate a system to process and purify dirty water</li> <li>Investigate how to best purify dirty water in class and/or at home</li> </ul>					
<b>SBA (FORMAL ASSESSMENT)</b>	<ul style="list-style-type: none"> <li>Practical task/investigation</li> <li>Test</li> </ul>									

2023/24 ANNUAL TEACHING PLANS: NATURAL SCIENCES AND TECHNOLOGY: GRADE 6 (TERM 3)

TERM 3	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10 AND 11	
<b>CAPS TOPICS</b>	<b>Energy and change &amp; Systems and control</b>										
	<b>Electric circuits</b>			<b>Electrical conductors and insulators</b>		<b>Systems to solve problems</b>		<b>Mains electricity</b>		<b>Remediation, revision and consolidation</b>	
<b>CORE CONCEPTS, SKILLS AND VALUES</b>	<ul style="list-style-type: none"> <li>A simple circuit</li> <li>Circuit diagrams</li> </ul>			<ul style="list-style-type: none"> <li>Conductors</li> <li>Insulators</li> </ul>		<ul style="list-style-type: none"> <li>Using electric circuits</li> </ul>		<ul style="list-style-type: none"> <li>Fossil fuels and electricity</li> <li>Cost of electricity</li> <li>Renewable ways to generate electricity</li> </ul>			
<b>REQUISITE PRE-KNOWLEDGE</b>	<ul style="list-style-type: none"> <li>Grade 5: Energy and electricity</li> </ul>					<ul style="list-style-type: none"> <li>Grade 5: Stored energy in fuels; Energy; Electricity; Fossils (Planet Earth and beyond)</li> </ul>					
<b>RESOURCES (other than textbook) TO ENHANCE LEARNING</b>	<ul style="list-style-type: none"> <li>Equipment such as cells/batteries, conducting wires, light bulbs and switches</li> <li>Video clips PhET simulations from the internet</li> </ul>			<ul style="list-style-type: none"> <li>Cells/batteries, conducting wires, light bulbs and switches</li> <li>Different materials including metal paper clips, nails, wire, steel wool, coins, plastic, glass, ceramic, cardboard, paper, wood, rubber, chalk, plastic insulated wires, rubber gloves used by electricians</li> <li>Video clips and PhET simulations from the internet</li> </ul>		<ul style="list-style-type: none"> <li>Basic components for a circuit, including components such as cells, light bulbs, conducting wires, buzzers and switches.</li> <li>Video clips and PhET simulations from the internet</li> </ul>		<ul style="list-style-type: none"> <li>Pictures and video clips of fuels and their various uses</li> <li>Pictures to show how electricity is generated in a coal-fired power station</li> <li>Examples of electrical appliances</li> <li>Pictures and information of renewable ways to generate electricity, including examples of wind power generators, solar power generators and hydro-electric power generators</li> </ul>			
<b>INFORMAL ASSESSMENT</b>	<ul style="list-style-type: none"> <li>Investigate different ways of making a simple circuit</li> <li>Investigate, design and make a switch to control the circuit</li> <li>Investigate and understand how the different components function and what symbols are used to represent them in a circuit diagram.</li> <li>Draw simple closed electrical circuit diagrams using the symbols for the various components</li> </ul>			<ul style="list-style-type: none"> <li>Investigate what conductors and insulators are by testing different materials (such as metal paper clips, nails, wire, steel wool, coins, plastic, glass, ceramic, cardboard, paper, wood, rubber and chalk) in an electric circuit to see if they are conductors or insulators and recording the results in a table</li> <li>Identifying where electrical insulators are used, e.g.: insulating wires, rubber gloves, glass and ceramic insulators on power lines</li> </ul>		<ul style="list-style-type: none"> <li>Design, make, evaluate and present a system that uses a circuit to produce movement, light, sound or heat in a structure such as:                             <ul style="list-style-type: none"> <li>A steady hand game, house, light house or a toy</li> <li>The circuit should include components such as cells, light bulbs, buzzers and switches.</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>Explain the steps that outline the process to make electricity from coal</li> <li>Use diagrams to trace and explain the flow of electrical energy in a sequence from an appliance, such as from your TV set to the coal-fired power station and back to the original source, the Sun.</li> <li>Examine labels (in adverts or on real electrical appliances) to find out how much power they require in a certain time (e.g. a kettle, a radio, a TV, an iron, a hot plate, charging a cell phone, etc. (most kettles require more than 2 000 W, while a radio requires just more than 15 W) and make comparisons</li> <li>Explain different ways to save electricity, from small actions to larger actions</li> <li>Research and write about renewable ways to generate electricity, including in wind power generators, solar panels (photovoltaics), hydro-electric power generators, biomass and geothermal energy.</li> </ul>			
<b>SBA (FORMAL ASSESSMENT)</b>	<ul style="list-style-type: none"> <li>Practical task/investigation</li> <li>Test</li> </ul>										

2023/24 ANNUAL TEACHING PLANS: NATURAL SCIENCES AND TECHNOLOGY: GRADE 6 (TERM 4)

TERM 4	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	
<b>CAPS TOPICS</b>	<b>Planet Earth and beyond &amp; Systems and Control</b>									
	<b>The Solar System</b>		<b>Movements of the Earth and planets</b>	<b>The movement of the Moon</b>	<b>Systems for looking into space</b>	<b>Systems to explore the Moon and Mars</b>			<b>Remediation, revision, and consolidation</b>	
<b>CORE CONCEPTS, SKILLS AND VALUES</b>	<ul style="list-style-type: none"> <li>The Sun, planets and asteroids</li> <li>Moons</li> </ul>		<ul style="list-style-type: none"> <li>Rotation (Earth)</li> <li>Revolution (Earth)</li> </ul>	<ul style="list-style-type: none"> <li>Rotation (Moon)</li> <li>Revolution (Moon)</li> </ul>	<ul style="list-style-type: none"> <li>Telescopes</li> </ul>	<ul style="list-style-type: none"> <li>Vehicles used on the Moon</li> <li>Vehicles used on Mars</li> </ul>				
<b>REQUISITE PRE-KNOWLEDGE</b>	<ul style="list-style-type: none"> <li>Grade 4: Planet Earth – Features of the Earth; Earth and Space</li> <li>Grade 4: The Sun: Our closest star</li> <li>Grade 4: The Earth and the Sun – Moving around the Sun; The Sun and life</li> <li>Grade 4: The Moon – Features of the Moon; Phases of the Moon</li> <li>Grade 5: Planet Earth – The Earth moves</li> </ul>									
<b>RESOURCES (other than textbook) TO ENHANCE LEARNING</b>	<ul style="list-style-type: none"> <li>Detailed pictures and models of the Solar System (<i>not to scale</i>)</li> <li>Pictures of the Moon</li> <li>Video clips from the internet</li> </ul>		<ul style="list-style-type: none"> <li>Models and a light source such as torch, lamp or candle to demonstrate the movements of the Earth</li> </ul>	<ul style="list-style-type: none"> <li>Models and a light source such as torch, lamp or candle to demonstrate the movements of the Moon</li> </ul>	<ul style="list-style-type: none"> <li>Pictures and information about telescopes</li> </ul>	<ul style="list-style-type: none"> <li>Pictures of the Moon and Mars Rovers</li> <li>Video clips from the internet</li> <li>Apparatus including bottle tops, round tins or circular cardboard shapes for the wheels, sositie sticks or dowels and straws for the axles</li> <li>Measuring tapes or metre sticks</li> </ul>				
<b>INFORMAL ASSESSMENT</b>	<ul style="list-style-type: none"> <li>Research/read information about the planets, focusing on size, distance from the Sun, average temperature, number of moons, atmosphere, and any other features</li> <li>Making models of the Solar System (<i>not to scale</i>) considering the position in relation to the Sun and the size and features of the planets</li> <li>Describe and draw the objects in our Solar System</li> </ul>		<ul style="list-style-type: none"> <li>Demonstrate the movements (rotation and revolution) of the Earth using models and body movements</li> <li>Demonstrates how daytime and night-time occur using a model of the Earth and a light source</li> <li>Draw and write about the rotation of the Earth in relation to the Sun: How daytime and night-time occur</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate the rotation and revolution of the Moon around the Earth using models and body movements</li> <li>Draw and write about the rotation of the Moon in relation to the Earth and the solar system</li> <li>Drawing a table of comparison between the Sun, the Earth and the Moon including shape, composition, size, movement in relation to other space objects and the ability to produce light</li> </ul>	<ul style="list-style-type: none"> <li>Identify the different telescopes and how they work</li> <li>Doing a case study about telescopes such as simple telescopes, SALT and SKA</li> </ul>	<ul style="list-style-type: none"> <li>Describe the vehicles used to explore the Moon and Mars</li> <li>Researching the key features and purposes of the Moon and Mars rovers including the components, build and systems used for energy and communications</li> <li>Design, make and evaluate a model of one of the vehicles moving with wheels and axles</li> <li>Measuring the distance vehicles can move down a ramp and plotting the information on a bar graph</li> </ul>				
<b>SBA (FORMAL ASSESSMENT)</b>	<ul style="list-style-type: none"> <li>Test</li> </ul>									

**MAJOR PROCESS AND DESIGN SKILLS**

The teaching and learning of Natural Sciences and Technology involves the development of a range of process and design skills that may be used in everyday life in the community and in the workplace. Learners also develop the ability to think objectively and use a variety of forms of reasoning while they use these skills. Learners can gain these skills in an environment that taps into their curiosity about the world, and that supports creativity, responsibility and growing confidence.

The following are the cognitive and practical process and design skills that learners will be able to develop in Natural Sciences and Technology.

1. *Accessing and recalling information* – being able to use a variety of sources to acquire information, and to remember relevant facts and key ideas, and to build a conceptual framework
2. *Observing* – noting objects, organisms and events in detail
3. *Comparing* – noting similarities and differences between things
4. *Measuring* – using measuring instruments such as rulers, thermometers, clocks and syringes (for volume)
5. *Sorting and classifying* – applying criteria in order to sort items into a table, mind-map, key, list or other format
6. *Identifying problems and issues* – being able to articulate the needs and wants of people in society STATEMENT (CAPS)
7. *Raising questions* – being able to think of and articulate relevant questions about problems, issues and natural phenomena
8. *Predicting* – stating, before an investigation, what the learner thinks the results will be for that particular investigation
9. *Hypothesising* – putting forward a suggestion or possible explanation to account for certain facts. A hypothesis is used as a basis for further investigation that will prove or disprove the hypothesis
10. *Planning investigations* – thinking through the method for an activity or investigation in advance. Identifying the need to make an investigation a fair test by keeping some things (variables) the same, while other things will vary
11. *Doing investigations* – this involves carrying out methods using appropriate apparatus and equipment, and collecting data by observing and comparing, measuring and estimating, sequencing, or sorting and classifying. Sometimes an investigation has to be repeated to verify the results
12. *Recording information* – recording data from an investigation in a systematic way, which includes drawings, descriptions, tables and graphs
13. *Interpreting information* – explaining what the results of an activity or investigation mean (this includes reading skills)
14. *Designing* – showing (e.g. by drawing) how something is to be made, taking into account the design brief, specifications and constraints
15. *Making/constructing* – building or assembling an object using appropriate materials and tools and using skills such as measuring, cutting, folding, rolling and gluing
16. *Evaluating and improving products* – using criteria to assess a constructed object and then stating or carrying out ways to refine that object
17. *Communicating* – using written, oral, visual, graphic and other forms of communication to make information available to other people