

# 2021 Annual Teaching Plan

## Natural Sciences

### Grade 7

#### Life and Living

Term 1 45 days	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
<b>CAPS Topic</b>	<b>The biosphere</b> (1 week)	<b>Biodiversity</b> (3 ½ weeks)			<b>Sexual Reproduction</b> (3 ½ weeks)			<b>Variation</b> (1 week)	
<b>Core Concepts, Skills and Values</b>	<ul style="list-style-type: none"> <li>The concept of the biosphere</li> <li>Requirements for sustaining life</li> </ul>	<ul style="list-style-type: none"> <li>Classification of living things</li> <li>Diversity of animals</li> <li>Diversity of plants</li> </ul>			<ul style="list-style-type: none"> <li>Sexual Reproduction in Angiosperms</li> <li>Human Reproduction</li> </ul>			<ul style="list-style-type: none"> <li>Variations exists within a species</li> </ul>	
<b>Requisite Pre-Knowledge</b>	<ul style="list-style-type: none"> <li>Grade 4: Living things; Structure of Plants; Habitats of animals</li> <li>Grade 5: Food chains and Life cycles</li> <li>Grade 6: Photosynthesis</li> </ul>				<ul style="list-style-type: none"> <li>Grade 4: Living things; Structure of Plants &amp; Structure of Animals</li> <li>Grade 5: Food chains and Life cycles</li> </ul>				
<b>Resources (other than textbook) to enhance learning</b>	<ul style="list-style-type: none"> <li>Reference materials</li> <li>Pictures and/or video clips of Earth and its biosphere</li> <li>Seeds, soil and containers to grow seeds, rulers or measuring tapes</li> </ul>	<ul style="list-style-type: none"> <li>Selection of pictures, photographs or drawings of vertebrates and invertebrates</li> <li>Magnifying lenses, live or preserved specimens</li> <li>Reference materials</li> <li>Selection of plants collected in and around the school property</li> <li>Magnifying lenses</li> <li>Live or preserved specimens</li> </ul>			<ul style="list-style-type: none"> <li>A variety of plant specimens</li> <li>Soil</li> <li>Containers to grow plants</li> <li>Seeds (such as beans and maize)</li> <li>Rulers or measuring tapes</li> </ul>				
<b>Informal Assessment</b>	<ul style="list-style-type: none"> <li>Describe the components of Earth's biospheres and identify living organisms found in each sphere.</li> <li>Investigate conditions required to sustain life such as light and water for the growth of seedlings.</li> <li>Germinate seeds and grow the seedlings under different conditions. Observe, draw and record the stages in the life cycle by measuring the height of the plant as it grows and recording observations in diagrams, tables and graphs.</li> <li>Distinguishing characteristics of the 5 classes of vertebrates.</li> <li>Identify the distinguishing characteristics of the five (5) classes of vertebrates.</li> <li>Identify the distinguishing characteristics of the four (4) groups (Classes / Phyla) of invertebrates by observing and describing the land snail.</li> </ul>				<ul style="list-style-type: none"> <li>Identify and describe the observable differences between Angiosperms and Gymnosperms.</li> <li>Identify and describe the observable differences between monocotyledons and dicotyledons.</li> <li>Identify, draw and describe the components of a flower.</li> <li>Compare the structure of a variety of flowers, how they are adapted to promote pollination and the methods of pollination</li> <li>Describe the different fruit and seeds and their methods of seed dispersal.</li> <li>Describe the changes experienced during puberty</li> <li>Describe the structure and the functions of the reproductive organs of humans</li> <li>Define the terms puberty, menstruation, fertilization, pregnancy and contraception</li> <li>Link the presence of differences between living things of the same species to variation</li> </ul>				
<b>SBA (Formal Assessment)</b>	<ul style="list-style-type: none"> <li>Practical task / Investigation</li> <li>Test</li> </ul>								

## Matter and Materials

Term 2 51 days	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
CAPS Topic	<b>Solids, liquids and gases</b> (½ week)	<b>Properties of Materials</b> (1½ weeks)	<b>Solution as a special mixture</b> (1 week)	<b>Dissolving</b> (1 week)	<b>Separating Mixtures</b> (2 weeks)		<b>Acids, bases and neutrals</b> (2 weeks)	
Core Concepts, Skills and Values	<ul style="list-style-type: none"> <li>• <b>Arrangements of particles</b></li> </ul>	<ul style="list-style-type: none"> <li>• boiling and melting points</li> <li>• electrical conductivity</li> <li>• heat conductivity</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Solutions</b></li> <li>• <b>Soluble substances</b></li> <li>• <b>Insoluble substances</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Rates of dissolving</b></li> </ul>	<ul style="list-style-type: none"> <li>• Mixtures</li> <li>• Methods of physical separation</li> <li>• Sorting and recycling materials</li> </ul>		<ul style="list-style-type: none"> <li>• Tastes of substances</li> <li>• Properties of acids, bases and neutrals</li> <li>• Properties of acids, bases and neutrals</li> <li>• Acid-base indicators</li> </ul>	
Requisite Pre-Knowledge	Grade 4: Materials around us				Grade 6: Mixtures		Grade 6: Nutrients in food	
Resources (other than textbook) to enhance learning	<ul style="list-style-type: none"> <li>• <b>Video clips of arrangement of particles from the internet</b></li> </ul>	<ul style="list-style-type: none"> <li>• Selection of materials for example: Paper, cardboard, copper wire, wood, rubber, plastic, stone/clay, brick, glass, aluminium foil, wax paper, rope/string</li> <li>• Heat sources</li> <li>• Tripod stands, gauze and glass containers</li> <li>• Thermometers</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Examples of materials and substances such as salt, sugar, sand, mealie meal, flour, maize flour, samp, curry powder, custard powder</b></li> <li>• <b>Measuring cylinders, funnels, filter paper, beakers, evaporating dish, salt, food colouring</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Containers, beakers, ice cream sticks for stirring, measuring spoons, hot water, salt (coarse and fine)</b></li> </ul>	<ul style="list-style-type: none"> <li>• Sieves</li> <li>• Filter paper</li> <li>• Funnel</li> <li>• Glass or plastic jars</li> <li>• Magnets</li> <li>• Iron or metal filings (or coins)</li> <li>• Sugar/salt</li> <li>• Heat source</li> <li>• Liebig condenser (if available) or test tubes, stoppers and glass and rubber tubes</li> <li>• Black ink</li> <li>• Koki colours</li> <li>• Methylated spirits</li> </ul>		<ul style="list-style-type: none"> <li>• Red litmus paper</li> <li>• Blue litmus paper</li> <li>• Glass containers</li> <li>• Liquids such as: tea, rooibos, coffee, milk, fruit juices, fizzy drinks,</li> <li>• Household substances such as: vinegar, tartaric acid, lemon, antacids, shampoo, soap, bicarbonate of soda, liquid soap</li> </ul>	
Informal Assessment	<ul style="list-style-type: none"> <li>• Measure the temperature of water as it heats up to boiling point, draw accurate line graphs, understand and explain the results</li> <li>• Explain the separation processes correctly and write about how to separate and collect sand, iron filings, salt, ethanol and water from a mixture</li> <li>• Classify several common beverages/ household substances into acids or bases or neutrals using an indicator</li> <li>• Design and explaining about the best ways to separate and collect all the materials from a mixture</li> </ul>							
SBA (Formal Assessment)	<ul style="list-style-type: none"> <li>• Practical Task / Investigation</li> <li>• Test</li> </ul>							

## Energy and Change

Term 3 52 days	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
CAPS Topic	<b>Sources of Energy</b> (1 week)	<b>Potential &amp; Kinetic energy</b> (2 weeks)		<b>Heat Transfer</b> (2 weeks)		<ul style="list-style-type: none"> <li>• <b>Electric circuits</b></li> <li>• <b>Electrical conductors and Insulators</b></li> </ul>	<b>Insulation and energy saving</b> (2 weeks)		<b>Energy transfer to surroundings</b> (1 week)

				(1 week)		
<b>Core Concepts, Skills and Values</b>	<ul style="list-style-type: none"> <li>Renewable and non-renewable sources of energy</li> </ul>	<ul style="list-style-type: none"> <li>Potential energy</li> <li>Kinetic energy</li> <li>Potential and kinetic energy in systems</li> <li>Law of conservation of energy</li> </ul>	<ul style="list-style-type: none"> <li>Heating as a transfer of energy</li> <li>Conduction</li> <li>Convection</li> <li>Radiation</li> </ul>	<ul style="list-style-type: none"> <li>A simple circuit</li> <li>Circuit diagram</li> <li>Conductors</li> <li>Insulators</li> </ul>	Using insulating materials	Useful and 'wasted' energy
<b>Requisite Pre-Knowledge</b>	<ul style="list-style-type: none"> <li>Grade 4: Energy around us</li> <li>Grade 5: Stored energy in fuels</li> <li>Grade 6: Renewable versus non-renewable energy sources</li> </ul>		<ul style="list-style-type: none"> <li>Grade 4: Energy and Energy Transfer</li> <li>Grade 6: Fossil fuels and electricity</li> </ul>			
<b>Resources (other than textbook) to enhance learning</b>	<ul style="list-style-type: none"> <li>Reference materials</li> <li>Pictures and reading texts about non-renewable and renewable sources of energy</li> <li>Rubber bands</li> <li>Various food packaging with labels showing energy content</li> <li>Cells (batteries)</li> <li>Scissors, paper, rulers</li> <li>Candles, cans</li> <li>Cells (batteries), conducting wire, motors, torch bulbs, buzzers</li> </ul>	<ul style="list-style-type: none"> <li>Video clips from the internet to show conduction, convection and radiation</li> <li>Spirit / Bunsen burner</li> <li>Steel, brass, aluminium and Iron rods</li> <li>Styrofoam</li> <li>Wood</li> <li>Plastic</li> <li>Wax or Vaseline</li> <li>Drawing pins</li> <li>Heat conducting tins (if available)</li> <li>Wrist watch with a second hand / Stopwatch</li> <li>Food colouring or crystal of potassium permanganate</li> <li>Glass/transparent plastic container</li> <li>Candles</li> <li>Shiny silver surfaces (wrapped by aluminium foil)</li> <li>Matt black surfaces (painted matt black)</li> <li>Thermometers</li> </ul> Cardboard or paper and glue	<ul style="list-style-type: none"> <li>Equipment such as 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</li> <li>Different materials including plastic insulated wires, rubber gloves used by electricians, glass and ceramic</li> </ul>	<ul style="list-style-type: none"> <li>Pictures/diagrams of solar water heaters</li> <li>Video clips from internet</li> <li>Thermometers</li> <li>Insulating materials such as styrofoam, newspaper, plastic and glass containers, ice</li> <li>Cooking pot (or container), cardboard box to make a 'hotbox', insulation materials such as paper, fabric, cushions, blankets</li> <li>Materials to build a model of a house</li> <li>Insulating materials</li> </ul>	<ul style="list-style-type: none"> <li>Pictures or examples of tools/appliances such as electric drill, electric iron, kettle, food mixer</li> </ul>	
<b>Informal Assessment</b>	<ul style="list-style-type: none"> <li>Classify the energy sources as either renewable or non-renewable</li> <li>Discuss the advantages of using nuclear fuels instead of fossil fuels</li> </ul>	<ul style="list-style-type: none"> <li>Identifying energy transfers in mechanical systems</li> <li>Investigate the energy transfers when boiling water</li> </ul>	<ul style="list-style-type: none"> <li>Investigate if all materials conduct heat in the same way.</li> <li>Investigate which metals are the best conductors of heat.</li> <li>Investigate which surfaces absorb the most radiation</li> <li>Investigate which are the best insulating material</li> </ul>	<ul style="list-style-type: none"> <li>Identify 'wasted' energy in a system</li> </ul>		
<b>SBA (Formal Assessment)</b>	<ul style="list-style-type: none"> <li>Project</li> <li>Test</li> </ul>					

## Planet Earth and Beyond

Term 4 47 days	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
CAPS Topic	<b>The Solar System</b> (1 week)	<b>Movements of the Earth and planets</b> (1 week)	<b>Relationship of the Sun to the Earth</b> (3 weeks)			<b>The movement of the Moon</b> (1 week)	<b>Relationship of the moon to the earth</b> (2 weeks)	
Core Concepts, Skills and Values	<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>Solar energy and the Earth's seasons</li> <li>Solar energy and life on Earth</li> <li>Stored solar energy</li> </ul>			<ul style="list-style-type: none"> <li>Rotation (Moon)</li> <li>Revolution (Moon)</li> </ul>	<ul style="list-style-type: none"> <li>Relative positions</li> <li>Gravity</li> <li>Tides</li> </ul>	
Requisite Pre-Knowledge	Grade 5: Planet Earth		Grade 6: How the spin of the Earth on its axis causes day and night Grade 6: The solar system					
Resources (other than textbook) to enhance learning	<ul style="list-style-type: none"> <li>Detailed pictures and models of the Solar System</li> <li>Pictures of the Moon</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>Reference materials</li> <li>Globe / ball</li> <li>Torch</li> <li>Pictures and video clips from the internet of the Sun and showing:                             <ul style="list-style-type: none"> <li>the Earth's passage around the Sun</li> <li>the changing amounts of solar energy reaching different parts of the Earth through the year</li> </ul> </li> <li>Pictures and video clips from the internet of:                             <ul style="list-style-type: none"> <li>the Sun and</li> <li>how coal, oil and gas are formed from the Sun's energy</li> </ul> </li> </ul>			<ul style="list-style-type: none"> <li>Ball and rope or string</li> <li>Video clips from the internet showing:                             <ul style="list-style-type: none"> <li>the Moon in orbit around the Earth</li> <li>the Moon's gravity results in ocean tides on Earth</li> <li>Full Moon and New Moon cause spring tides</li> </ul> </li> <li>Pictures and texts about shoreline ecosystems</li> <li>Reference materials on significant discoveries relating to astronomy</li> </ul>		
Informal Assessment	<ul style="list-style-type: none"> <li>Investigate the direct and indirect light and its effects on temperature</li> <li>Investigate what would happen if the Sun's rays are blocked from reaching Earth.</li> <li>Explaining the flow of energy</li> </ul>							
SBA (Formal Assessment)	<ul style="list-style-type: none"> <li>Test</li> </ul>							

## Science process skills

The teaching and learning of Natural Sciences involves the development of a range of process 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 skills that learners will be able to develop in Natural Sciences

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 in detail objects, organisms and events
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
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 you think the results will be for that particular investigation
9. *Hypothesizing* – putting forward a suggestion or possible explanation to account for certain facts. A hypothesis is used as a basis for further investigation which 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 whilst 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, including drawings, descriptions, tables and graphs
13. *Interpreting information* – explaining what the results of an activity or investigation mean (this includes reading and understanding maps, tables, graphs). A Translation Task requires learners to make sense of information and convert the information into a different format e.g. from information captured on a table into a graph format and or written format.
14. *Communicating* – using written, oral, visual, graphic and other forms of communication to make information available to other people
15. *The Scientific Process* is a way of investigating things about the world. Scientists use this process to find out about the world and to solve problems. The steps that make up the scientific process are not necessarily in order (sequential), and may include:

*Step 1:* Identify a problem and develop a question. What is it you want to find out?

*Step 2:* Form a hypothesis. A hypothesis is your idea, answer, or prediction about what will happen and why.

*Step 3:* Design an activity or experiment. Do something that will help you test your idea or prediction to see if you were right.

*Step 4:* Observe/note changes/reactions (e.g. through measuring), and record your observations (e.g. onto a table). What were the results of your activity or experiment? Write about what happened.

*Step 5:* Make inferences about the observations recorded in the tables, graphs, drawings, photographs. Make some conclusions. What did you find out? Do your results support your hypothesis? What did you learn from this investigation?