## NATURAL SCIENCES

GRADE 9 TERM 4

Tracker

Week 1													
	CARC	Yea	r:				Year:						
CARC Constant and Astronomy	CAPS		(	Class	5			(	Class	5			
CAPS Concepts and Activities	Page												
	no.	Da	ite (	Com	olete	ed	D	ate (	Com	plete	ed		
Week 1 Lesson A													
Topic: The Earth as a system	78												
Content & Concepts: Spheres of the													
Earth													
The Earth can be understood as a													
complex system where all the parts													
(called spheres) interact with each other													
Week 1 Lesson B	70												
Topic: The Earth as a system	78												
Content & Concepts: Spheres of the													
Earth													
The Earth can be understood as a complex system where all the parts													
(called spheres) interact with each other													
Week 1 Lesson C													
Topic: The Earth as a system	78												
Content & Concepts: Spheres of the													
Earth													
Four spheres interact on or near the													
surface of the Earth:													
o the lithosphere consists of solid rock													
and soil  the hydrosphere consists of water in													
all its forms													
<ul> <li>the atmosphere is a layer of gases</li> </ul>													
around the Earth													
<ul> <li>the biosphere consists of all living</li> </ul>													
plants and animals and their													
interactions with rocks, soil, air and water													
	Reflection	n											
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## NECT LEARNING PROGRAMME: NATURAL SCIENCES GRADE 9 TERM 4 TRACKER

Year:		
Think about and make a note of: What went well? What did not go well? What did the learners find difficult or easy to understand or do? What will you do to support or extend learners? Did you cover all the work set for the week? If not, how will you get back on track?	What will you change next time	? Why?
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Week 2 Lesson A										
<ul> <li>Topic: The Earth as a system         Content &amp; Concepts: Lithosphere         The Earth consists of four concentric layers called the inner core, outer core, mantle and crust (link to Grade 7 Social Sciences)         </li> <li>The lithosphere ('lith' means 'rocks') has three layers: the solid outermost part of the mantle, the crust and the soil</li> <li>Different combinations of elements and compounds form minerals such as copper, gold and hematite (iron oxide) in the crust</li> </ul>	78									
Week 2 Lesson B Topic: The Earth as a system	78									
<ul> <li>Content &amp; Concepts: The rock cycle</li> <li>The rock cycle is the natural continuous process in which rocks form, are broken down and re-form over long periods of time</li> <li>There are three rock types: igneous, sedimentary and metamorphic rocks</li> <li>The rock cycle can be explained in the following steps:         <ul> <li>molten rock from the mantle (magma) pushes up through the crust</li> <li>pools of magma cool down slowly in the crust to form igneous rocks, like granite</li> <li>some magma escapes to the surface as a volcano</li> <li>this magma cools down rapidly to form igneous rocks, like pumice stone</li> </ul> </li> </ul>										

	Week 2 Lesson C										
Top	ic: The Earth as a system	78									
Cor	itent & Concepts: The rock cycle										
•	There are three rock types: igneous,										
	sedimentary and metamorphic rocks										
•	The rock cycle can be explained in the										
	following steps:  o rocks on the surface of the Earth are										
	weathered by heat, cold, wind and										
	water to form smaller particles										
	<ul> <li>wind and water transport these</li> </ul>										
	particles to flood plains and the sea										
	by erosion										
	<ul> <li>the particles are laid down as sediments</li> </ul>										
	<ul> <li>the sediments are covered by more</li> </ul>										
	layers										
•	The pressure of many layers turns the										
	lower layers into sedimentary rock like										
	sandstone										
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Top	oic: The Earth as a system	78										
Coi	ntent & Concepts: The rock cycle											
•	There are three rock types: igneous,											
	sedimentary and metamorphic rocks											
•	The rock cycle can be explained in the											
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	<ul> <li>the sediments are covered by more</li> </ul>											
	layers											
•	The pressure of many layers turns the											
	lower layers into sedimentary rock like											
	sandstone											
	Week 3 Lesson B											
-	pic: The Earth as a system	78										
Co	ntent & Concepts: The rock cycle											
•	Hot magma heats the surrounding rock											
	and changes its chemical structure to form metamorphic rock like slate from											
	shale or marble from limestone											
	Week 3 Lesson C											
To	pic: The Earth as a system	79										
-	ntent & Concepts: The rock cycle											
•	Some rock is pushed below the crust,											
	melts and becomes magma again											
		Reflection	n									
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Thir	nk about and make a note of: What went well? W	hat did not	gO	W	hat w	ill voi	ı char	nge ne	xt tim	e? W	hv?	
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Week A Leasen A		Date Completed			U	Date Completed								
Week 4 Lesson A	80													
Topic: Mining of mineral resources Content & Concepts: Extracting Ores	80													
People extract valuable minerals from														
the lithosphere														
Rock that contains high concentrations of														
a valuable mineral is called an ore														
The ore is removed from the crust by														
mining														
Some minerals can be used in their natural form such as sand, potash,														
diamonds														
Week 4 Lesson B														
Topic: Mining of mineral resources	80													
Content & Concepts: Refining materials														
Some other minerals require a chemical														
or physical process to extract the														
required material such as iron from iron-														
ore (chemical) or gold from gold-ore (physical)														
<ul> <li>Knowledge of iron and copper extraction</li> </ul>														
is thousands of years old:														
o iron ore was heated with charcoal to														
make lumps of iron														
<ul> <li>South African archaeological sites in KwaZulu Natal and Limpopo provide</li> </ul>														
evidence for this														
Modern processes mix coke (a form of														
carbon made from coal) and other metals														
with iron to produce steel														
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Week 5 Lesson A											
Topic: Mining of mineral resources	80										
Content & Concepts: Mining in South Africa											
There is large scale mining activity in											
South Africa											
Week 5 Lesson B											
Topic: Mining of mineral resources	80										
Content & Concepts: Mining in South											
<ul><li>Africa</li><li>This activity has significant</li></ul>											
environmental impacts such as:											
o creation of mine dumps											
o pollution of water resources											
<ul> <li>o damage to places with high tourist or cultural heritage value</li> </ul>											
o loss of farming and wild life											
environments											
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Week 5 Lesson C Topic: Mining of mineral resources	80										
Content & Concepts: Mining in South	00										
Africa											
There is large scale mining activity in											
South Africa											
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work set for the week? If not, how will you get back	on track?										
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	Week 6										
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Week 6 Lesson A											
Topic: Atmosphere	80										
Content & Concepts: Atmosphere											
The atmosphere is the mixture of gases											
held around the Earth by gravity											
• This mixture is known as air and consists of nitrogen (78%), oxygen (21%), carbon											
dioxide (less than 1%), and other gases,											
including water vapour (1%)											
The density of the gas particles decreases											
as the distance from the Earth increases											
(the further away from the Earth, the thinner the air)											
The atmosphere has four layers:											
troposphere, stratosphere, mesosphere,											
thermosphere											
Each layer has a different temperature gradient											
Temperature gradient is how much the											
temperature changes with height above											
sea level (altitude)											
Week 6 Lesson B											
Topic: Atmosphere	81										
Content & Concepts: Troposphere											
This layer extends from sea level to about											
10 km above the surface of the Earth											
It contains more than 70% of the mass of											
the atmosphere (particles closest together) and it has the greatest density											
The temperature decreases as the											
distance from the surface increases (the											
further away from the Earth, the colder											
the air)											
<ul><li>Weather occurs in this layer</li><li>All animals and plants live in this layer</li></ul>											
- 7 an annihais and plants live in this layer											

Week 6 Lesson C											
Topic: Atmosphere	81										
Content & Concepts: Stratosphere											
• This layer extends from about 10 km to											
about 50 km above the Earth's surface											
• The air in the stratosphere is very thin											
compared to the air in the troposphere											
<ul> <li>Some aeroplanes fly as high as the</li> </ul>											
stratosphere											
The stratosphere includes a band of											
ozone gas (O3) which absorbs ultraviolet											
radiation from the Sun											
<ul> <li>This absorption of ultraviolet radiation increases the temperature of the</li> </ul>											
stratosphere - as a result, the further											
away from the Earth, the warmer the air											
becomes											
Too much ultraviolet radiation interferes											
with life on Earth (human health,											
photosynthesis, life cycles and sizes of											
populations of species)											
	Reflectio	n									
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CAPS Concepts and Activities	Page											
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Week 7 Lesson A												
<ul> <li>Topic: Atmosphere</li> <li>Content &amp; Concepts: Mesosphere</li> <li>This layer extends from about 50 – 80 km above the Earth's surface</li> <li>The air is extremely thin and very cold</li> <li>There is still enough air in this layer to burn up small rocks and dust entering from space</li> </ul>	82											
Burning rocks are visible from the Earth and known as 'shooting stars'  Week 7 Lesson B  Topic: Atmosphere	82											
Content & Concepts: Thermosphere	02											
<ul> <li>This layer starts above 80 km from the Earth (the thermosphere slowly diminishes at about 350 km and space begins after that. Satellites orbit much further away)</li> <li>The International Space Station (ISS), where astronauts work in space orbits the Earth at a height of about 370 km</li> <li>The lowest part of the thermosphere absorbs ultraviolet radiation and dangerous X-rays from the Sun</li> <li>It also reflects radio waves back to Earth for TV and radio broadcasts</li> </ul>												

	Week 7 Lesson C											
Top	ic: Atmosphere	82										
-	tent & Concepts: The greenhouse											
effe	ct											
•	The greenhouse effect is a natural phenomenon – it warms the atmosphere sufficiently to sustain life Greenhouse gases trap the ultraviolet radiation which then warms the air closest to the surface of the earth (like inside a greenhouse) The most common greenhouse gases are carbon dioxide, water vapour and methane An increase in greenhouse gases leads to global warming Global warming is an increase in the average temperature of the atmosphere Global warming is a potentially life threatening problem on Earth. It can lead											
	to:											
	<ul><li>climate change</li><li>rising sea levels</li></ul>											
	o food shortages											
	<ul> <li>mass extinctions</li> </ul>											
		Reflection	n									
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well Wha worl	k about and make a note of: What went well? W ? What did the learners find difficult or easy to u t will you do to support or extend learners? Did s set for the week? If not, how will you get back of	nderstand o you cover a	or do?		hat w	rill you	u char	ige ne	ext tim	Da		
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	Week 8												
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Week 8 Lesson A													
Topic: Birth, life and death of stars	83												
<ul> <li>Content &amp; Concepts: The birth of a Star</li> <li>Stars exist for a finite period of time</li> <li>Stars form inside huge clouds of gas and dust called nebulae, far out in space</li> <li>These nebulae (huge amounts of dust and gas) are pulled together by gravity and slowly collapse</li> <li>As they contract they heat up</li> <li>Once the temperature is high enough a nuclear fusion reaction begins, that changes hydrogen to helium</li> <li>This reaction radiates large amounts of energy into space</li> </ul>													
Week 8 Lesson B													
<ul> <li>Topic: Birth, life and death of stars         Content &amp; Concepts: Life of a star         Stars change in their appearance over billions of years         Stars that look blue are hotter and usually younger than stars that appear red         </li> <li>Our sun is about half way through its life cycle – it is a medium-sized yellow star with a lifespan of about 9 billion years</li> <li>For most of their life, stars change hydrogen to helium</li> <li>Later, towards the end of their life, stars like the sun will swell up to form a 'red giant'</li> <li>Week 8 Lesson C</li> </ul>	83												
Topic: Birth, life and death of stars	83												
<ul> <li>Content &amp; Concepts: Death of a Star</li> <li>At some point the nuclear reaction runs out of fuel</li> <li>For stars like the Sun, the core of the star contracts to become a 'white dwarf'</li> <li>For stars like the Sun, the outer gases of the star are ejected into space, where they form an expanding cloud around the white dwarf called a planetary nebula</li> <li>Planetary nebulae are lit up by their central white dwarf star and are beautiful objects to observe</li> </ul>													

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Topic: Revision and Study	71-84												
Week 9 Lesson B	71-84												
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Week 9 Lesson C													
Topic: Revision and Study	71-84												
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