

LEARNING AREA **NATURAL SCIENCES**

GRADE

7

MODULAR
7

4

**PLANET EARTH AND THE
UNIVERSE**

MODULE FRAMEWORK AND ASSESSMENT SHEET

LEARNING OUTCOMES (LOs)	ASSESSMENT STANDARDS (ASs)	FORMATIVE ASSESSMENT		SUMMATIVE ASSESSMENT	
		ASs Pages	(mark out of 4)	LOs (ave out of 4)	Tasks or tests (%)
<p>LO 1</p> <p>SCIENTIFIC INVESTIGATIONS The learner will be able to act confidently on curiosity about natural phenomena, and to investigate relationships and solve problems in scientific, technological and environmental contexts.</p>	<p><i>We know this when the learner:</i></p> <p>1.1 plans investigations: plans simple tests and comparisons, and considers how to make them fair;</p> <p>1.2 conducts investigations and collects data: organises and uses equipment or source to gather and record information;</p> <p>1.3 evaluates data and communicates findings: generalises in terms of a relevant aspect and describes how the data supports the generalisation; and</p> <p>1.3.1 offers a strong example of evidence that supports the finding.</p>	<p>1</p> <p>4, 6</p> <p>6, 24, 27</p>			
<p>LO 2</p> <p>CONSTRUCTING SCIENCE KNOWLEDGE The learner will know and be able to interpret and apply scientific, technological and environmental knowledge.</p>	<p><i>We know this when the learner:</i></p> <p>2.1 categorises information: compares features of different categories of objects, organisms and events;</p> <p>2.3 interprets information: interprets information by identifying key ideas in text, finding patterns in recorded data, and making inferences from information in various forms (e.g. pictures, diagrams, text);</p> <p>2.4 applies knowledge: applies conceptual knowledge by linking a taught concept to a variation of a familiar situation.</p>	<p>6, 17</p> <p>6, 17, 24, 27</p> <p>6</p>			

LEARNING OUTCOMES (LOs)	ASSESSMENT STANDARDS (ASs)	FORMATIVE ASSESSMENT		SUMMATIVE ASSESSMENT		
		ASs Pages	<i>(mark out of 4)</i>	LOs <i>(ave out of 4)</i>	Tasks or tests <i>(%)</i>	Ave for LO <i>(% and mark out of 4)</i>
<p align="center">LO 3</p> <p>SCIENCE, SOCIETY AND THE ENVIRONMENT</p> <p>The learner will be able to demonstrate an understanding of the interrelationships between science and technology, society and the environment.</p>	<p><i>We know this when the learner:</i></p> <p>3.1 understands science as a human endeavour: compares differing interpretations of events.</p>	27				

PLANET EARTH AND THE UNIVERSE

LEARNING UNIT 1

OUR SOLAR SYSTEM

Activity
1.1

TO GIVE AN OVERVIEW OF THE
SOLAR SYSTEM

LO 1.1

Read the section below carefully and answer the following questions.

THE SOLAR SYSTEM

- ▶▶ The earth is part of a group of planets and bodies which is called the solar system. The sun is the central point of the universe and the other bodies orbit around it. The sun is actually a star and is much bigger than the members of the solar system. The planets shine because they reflect the sun's light.
- ▶▶ There are nine planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto. All the planets have moons except for Mercury and Venus. Some planets, like Earth, have only one moon but others have more. Saturn has seventeen.
- ▶▶ The sun also has smaller family members, for example meteors, asteroids and comets. Most asteroids revolve around the sun in smaller orbits.

TASK 1

Use a dictionary and define the following:

1. Asteroids:

.....

.....

2. Comets:

.....
.....

3. Meteors:

.....
.....



TASK 2

The astronomer Edmund Halley predicted in 1705 that a comet would appear in 1758. He was right. He calculated in which year the same comet would re-appear. He had already died by the time the comet re-appeared and in his honour the comet was named after him.

Write a short report on Halley's comet in which you discuss the following aspects:



Why was the word "comet" derived from the Greek word "cometes" which means "hairy star"?



How often does the comet re-appear? Why does it appear when it does?



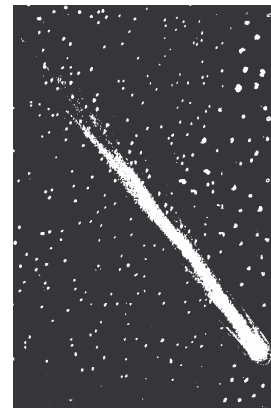
How many times did it appear in the 20th Century (1901 to 2000)?



Is it humanly possible to see the comet twice?



Make short notes about Edmund Halley's life.



RESEARCH PROJECT: EDWARD HALLEY EDUCATOR ASSESSMENT

CRITERIA	1	2	3	4
TECHNICAL PRESENTATION:				
▶ Cover page: Subject indicated; Name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ Neatness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ Handed in on time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ Prescribed length	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CONTENTS:				
▶ Subdivisions indicated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ Information logically presented	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ Interesting facts included	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ Concluding paragraph?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ Illustrations or pictures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LANGUAGE USE				
▶ Paragraphs used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ Correct language usage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ Punctuation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EVIDENCE OF RESEARCH				
▶ Sources indicated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ Sources correctly listed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ All questions answered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OVERALL CODE				
CONVERT TO MARK:				
0% - 34%: 1	Percentage awarded: %			
35% - 39%: 2				
40% - 69%: 3				
70% - 100%: 4				

Comment:

.....

.....

Educator:

TO INVESTIGATE THE PROPERTIES OF
THE SUN AND TO EXPLAIN CONCEPTS
SUCH AS “CONSTELLATIONS” AND THE
“EXPLORATION OF SPACE”

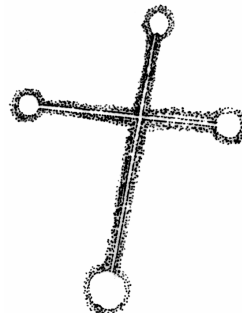
OUR OWN STAR - THE SUN

- ▶ The sun is an ordinary star in the Milky Way (our galaxy). It is an incredibly large revolving ball of gas with a diameter of 1,4 million kilometres. This is more than a hundred times more than the earth's diameter. The sun is 150 million kilometres from the earth and it takes 8 minutes for the light from the sun's surface to reach the earth.
- ▶ The sun develops so much energy that its surface glows white-hot at a temperature of 6 000 degrees Celsius. The energy originates at the centre of the sun as a result of nuclear activity. The sun has been shining for about 4,5 milliard years. After another 5 milliard years the sun's supply of hydrogen will be exhausted. No life can exist on Earth without sunlight.
- ▶ The sun is vital for life on Earth. It supplies almost all the energy that we have to our disposal. Even the coal that we burn originally was forests of which the growth was sustained by the energy from the sun. No life on Earth will survive if the sun stops shining.
- ▶ The universe is so big that astronomers measure it in light-years. A light-year is the distance that light travels in one year - 9,5 million kilometres. Light moves at 300 000 kilometres a second.

CONSTELLATIONS



Astronomers have divided the universe into constellations. The first astronomer to investigate the *Southern Cross* from South Africa was Guy Tachard in 1685. This constellation appears on the flags of New Zealand and Australia.



CRITERIA FOR ASSESSING PARAGRAPHS

	Level 4	Level 3	Level 2	Level 1
PLANNING AND COHERENCE OF STRUCTURE:	thorough planning, logical and effective	planning sufficient, correct sentence structure	little evidence of planning, faulty sentence construction	no evidence of planning, many errors in sentence construction
CORRECTNESS OF INFORMATION:	information correct, very interesting, shows creativity	information correctly given	information not entirely accurate	information is full of factual errors
PRESENTATION:	extremely neat, orderly and creative	presentation is neat and orderly	presentation slightly confused and untidy	presentation not at all structured, untidy

		LO 1.2	
		LO 1.3	
	TO DISCUSS THE PLANETS OF OUR SOLAR SYSTEM	LO 2.1	
		LO 2.2	
		LO 2.3	

**Activity
1.3**

TO DISCUSS THE PLANETS OF OUR SOLAR SYSTEM

LO 1.2

LO 1.3

LO 2.1

LO 2.2

LO 2.3

THE INNER PLANETS



Mercury

This is the closet planet to the sun. Mercury has many craters on its surface caused by asteroids which have collided with the planet. Mercury has no atmosphere or any moons. The temperature at the equator is approximately 400 degrees Celsius and at the poles it is -150 degrees Celsius.



Venus

Venus has an atmosphere of carbon dioxide that is much thicker than the earth's atmosphere. The surface is hidden beneath thick clouds of sulphuric acid. Temperatures at the surface reach approximately 480 degrees Celsius. Venus is about the same size as the earth and has about the same mass.



Earth

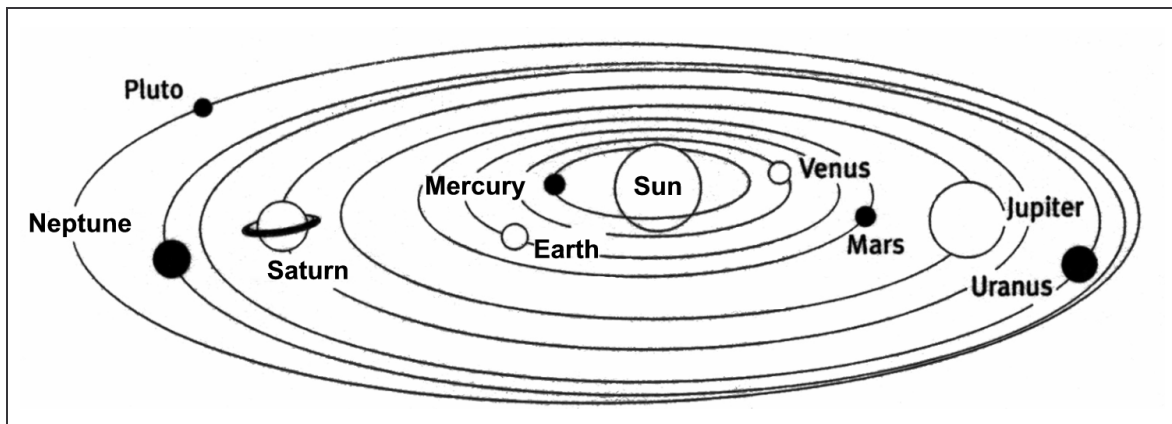
As far as we know the earth is the only place in the universe where life occurs. Temperatures on the surface vary between 60 degrees and -90 degrees Celsius. Approximately two thirds of the surface is covered by liquid water.



Mars

Mars is also called the Red Planet because the iron on its surface gives off a red glow. The atmosphere is about 100 times less dense than that of the earth. It consists of carbon dioxide with very small quantities of water vapour. Ice fields form at a temperature of -125 degrees Celsius in winter. Summer temperatures reach a maximum of 20 degrees Celsius.

Illustration of the position of the planets in the solar system



THE OUTER PLANETS



Jupiter

Jupiter contains 300 times as much matter as the earth and is the largest planet in the solar system. Jupiter is a giant ball of liquid gas and possibly has no solid surface. The only features that can be seen through a telescope are coloured stripes of clouds stretching around Jupiter. Jupiter has a large red spot known as the Red Spot. It is a tornado (a storm) which rages permanently and covers an area greater than the earth's surface.



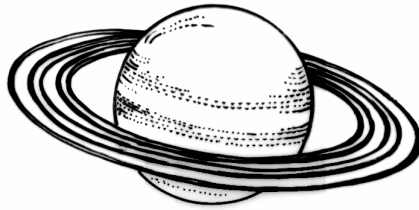
Saturn

Saturn is the second gas giant and is very much like Jupiter. It consists mainly of hydrogen and helium with a surface temperature of -170 degrees Celsius. Saturn's spectacular rings make it one of the brightest objects in our solar system. The rings move around the equator of Saturn in a very thin band. They consist of millions of pieces of ice, almost like snowballs. Saturn has seventeen moons of which Titan is probably the largest in our solar system. Two Voyager spacecraft have already been dispatched to explore the outer planets. Saturn is eight times further from us than the sun. It takes the radio signals from the spacecraft more than an hour to reach the earth.



Uranus, Neptune and Pluto

These three planets are very far from the earth and are known as the ice giants. Surface temperatures vary between -197 degrees Celsius to -233 degrees Celsius.



TASK 4



Use the initial letters of the names of the planets, (M, V, E, M, J, S, U, N, P) to make a rhyme or story to help you remember the order of the planets.

.....

.....

.....

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TASK 5

Answer the following questions:

1. Which planet becomes so hot that lead would melt on its surface?
.....
2. Give two reasons why life as we know it is impossible on Mars.
.....
.....
3. Why is Venus sometimes called Earth's twin?
.....
4. On which planet is there a large amount of the material used in car batteries to be found?
.....
5. Why is the maximum temperature on Mars much higher than that on Neptune?
.....
6. On which other body besides Earth in our solar system have people walked?
.....
7. Why is Mars sometimes called the Red Planet?
.....
8. Why is life as we know it possible on Earth?
.....
9. Radio signals take more than an hour to reach the earth from Saturn. What dangers could this hold for spacecraft undertaking exploration?
.....

TASK 6: TRANSLATE FROM TABLE TO GRAPH

Show two of the columns of information below by means of graphs. Use columnar, circular or linear graphs.

PLANET	DISTANCE FROM THE SUN IN MILLIONS OF KILOMETRES	RADIUS IN KM	NUMBER OF MOONS	AVERAGE SPEED IN KM PER SECOND
MERCURY	58	4 878	0	48
VENUS	108	12 104	0	35
EARTH	150	12 756	1	30
MARS	228	6 794	2	24
JUPITER	778	142 800	16	13
SATURN	1 427	120 000	17	10
URANUS	2 870	52 000	15	7
NEPTUNE	4 497	48 000	2	5
PLUTO	5 900	2 400	1	5

CRITERIA FOR ASSESSING GRAPHS

1. 2. 3. 4.

1. Heading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Description of both axes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Scale correctly shown	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Co-ordinates correctly shown	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Completeness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Neatness and care taken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comment:.....

.....



TASK 7

Use the information in the tables to make deductions and to answer the following questions:

1. Which two planets are the closest together?

.....
.....

2. What is the ideal distance from the sun for human survival?

.....
.....

3. Which planet has a radius about twice that of Pluto?

.....

4. Which two planets besides Earth could possibly be a home for humans?

.....
.....
.....

5. Has the distance from the sun any influence on the average speed of a planet? Which rule could you make for this?

.....
.....
.....

6. Give a possible explanation for this.

.....
.....
.....
.....

7. If the earth moves at a speed of 30 km per second, how long does it take the earth to move from one line of longitude to the next. Remember, there are 360 lines of longitude.

.....

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GROUP ASSESSMENT: MAKING DEDUCTIONS

1. We could make direct deductions.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. We could give a sensible explanation for human survival.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. We could formulate a rule about the distance of planets from the sun.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
4. We could give a sensible explanation for the above.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
5. We could calculate how long it takes the earth to move through one degree of longitude.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6. We could answer most of the questions independently.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
7. Co-operation in the group was good.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
8. Each individual made a contribution.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

GROUP JUDGES SUCCESS OF THE EXERCISE:

TASK 8

8.1 Mars – a rare planet

Read the facts below and discuss the questions in your groups.



Mars has a north and south pole that are white because of frozen snow and carbon dioxide.



The length of the day on Mars is only 41 minutes longer than the length of a day on Earth.



A year on Mars is however as long as 687 days on Earth. There are two seasons on Mars, summer and winter. During summer there are fierce dust storms, which make the sky appear pink and orange.



The dust absorbs energy from the sun and this allows the temperature to rise to 20 degrees Celsius.



The atmosphere on Mars is very thin and dangerous ultra-violet rays can thus reach the surface.



Scientists believe that long ago there was water on Mars with large rivers and seas. These days there is almost no water left on the surface but they suspect that there is underground water.



No photograph shows any sign of life on Mars. Life as we know it can only exist if there is oxygen.

QUESTIONS:

1. Why do scientists think that there was water on Mars long ago?

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.....

2. If there was liquid water on Mars long ago, what can we deduce about the temperature on Mars at that time?

.....
.....

3. Why is Mars so cold now?

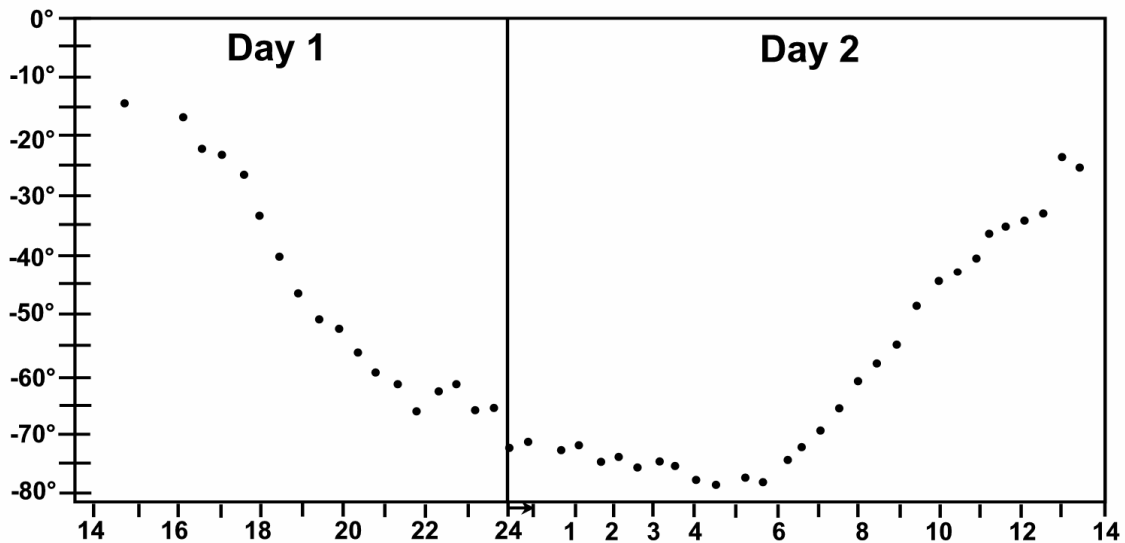
.....
.....

4. What would it feel like to breathe on Mars?

.....
.....

8.2 Temperature on Mars

Robot vehicles measured the temperature on Mars over a two-day period.



The horizontal axis shows us earth time. The 14 means 14:00 (2 pm) and 18 means 18:00 (6 pm).



The vertical axis shows the temperature in degrees Celsius.

Now answer the following questions:

1. What was the temperature at 21:00 on Day 1?

.....

2. At what time was the temperature -40 degrees Celsius?

.....

3. At what time was the temperature at its highest? What was the temperature at that time?

.....

4. At what time did the temperature begin to rise on Day 2?

.....

5. Give a possible reason for this rise in temperature.

.....

8.2 Life on Mars?

Life on Mars is not possible as there is no oxygen and also no water. If astronauts erect a base on Mars, obtaining sufficient water will be a one of their greatest problems. They could take water with them but it would quickly be exhausted.

One could argue that plants might be able to recover water as the leaves release water vapour, which condenses and runs down to the root as liquid water.



Think about the following:



Could plants be used to produce water in the base?



Is this possible without oxygen?



Can enough water for human consumption be produced like this?



Is there enough energy to use the water for human consumption?

LEARNING UNIT 2

THE EARTH

Activity
2.1

TO ANALYSE THE STRUCTURE OF THE
EARTH AND TO MEASURE MOVEMENTS IN
IT (NATURAL DISASTERS)

LO 2.1

LO 2.3

STRUCTURE OF THE EARTH

- ▶▶ Scientists believe that Earth came into existence about 4 600 million years ago as a large cloud of gas and dust swirling around in space. While it was rotating it shrank to an extremely hot, liquid ball. The surface gradually cooled and a crust of solid rock formed which weathered to the mountains, soil and sand on which we live today.
- ▶▶ Earth is continually changing. The land masses (continents) are not only moving, but new crust is forming all the time. The movement of the crust is called *continental drift* and it is still occurring. America, for example, is moving gradually away from Europe. This movement has already led to telephone cables under the Atlantic breaking.

FOUR LAYERS OF THE EARTH



The Crust

The crust is the outermost layer and has a thickness of from 5 km to 70 km. Under the oceans the crust can be as thin as 5 km and where there are mountains the crust can be as thick as 70 km. Beneath the crust there are three other layers. They are:



The Mantle

The mantle is 2 900 km thick. It is solid but contains slowly flowing currents of semi-melted metals.



The outer Core

The outer core consists of liquid metal and is responsible for the earth's magnetic field. It is 2 240 km thick.



The inner Core

The inner core in the middle of the earth is probably solid and consists mainly of metals. The temperature is 3 700 degrees Celsius. Water boils at 100 degrees Celsius. The inner core has a diameter of 2 240 km.

The lava that flows from volcanoes comes from the mantle.

TASK 1: GROUP WORK

Use playing dough (four different colours) to make a model of Earth's structure. The thickness of each layer should be more or less proportional to the actual thickness of the earth's layer.

Use a ball of red clay for the centre of the earth:

When the model is complete, change it into a cut-away model:



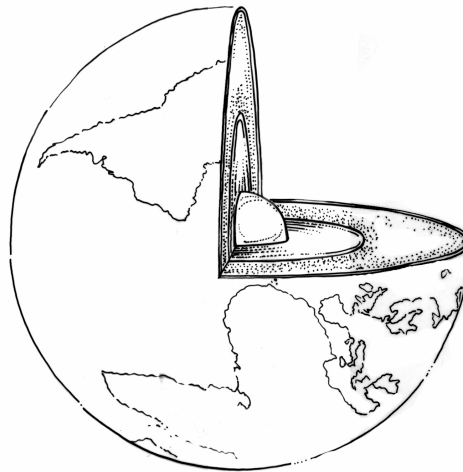
Cut the ball into two halves along the equator to make a northern and a southern hemisphere.



Cut the northern hemisphere in half to make two quarter spheres.



Place one of these back onto the southern hemisphere.



GROUP ASSESSMENT: MODEL

1. Good co-operation in group; all members make sensible contributions	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Model: Layers in correct order	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Model: Uses colour	<input type="checkbox"/> Yes	<input type="checkbox"/> No
8. Open work model: Correct steps followed and layers can be distinguished.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Comment:

EARTHQUAKES

- ▶▶ Scientists believe that in the past all the continents belonged to a single landmass that they have called *Pangea*. About 300 million years ago this landmass split into pieces that have drifted away from each other to the present position of the continents.
- ▶▶ The pieces into which the crust has divided are known as plates and each plate is about 40 km thick. They float because the rocks they consist of are lighter than the melted section of the mantle underneath. Sometimes they collide with each other and this causes deep trenches in the ocean floor and high mountains on land. The *Himalayas*, the highest mountain range on Earth, is still being pressed upwards by the collision between India and Asia. The Great Rift Valley, a tear that stretches across a large part of Africa, was formed when the surface sank along the line of two plates that were separating. Strong earthquakes can damage buildings, bridges and roads. Well-constructed buildings will suffer the least damage.
- ▶▶ *Seismologists* are scientists who study earthquakes. They measure the strength of an earthquake on the *Richter scale*. On this scale 1 equals a small earthquake that is felt as a light trembling on the surface. A large earthquake of 7 will cause huge damage to buildings, power supplies, roads etc. The place where the waves of the earthquake first reach the surface of the earth is called the *epicentre*. The effect of the earthquake is the greatest here. Sometimes the epicentre is under the sea. Then huge waves called *tsunamis* are caused.

TASK 2:

On 29 September 1969 an earthquake caused severe damage in the Boland towns of Ceres, Tulbagh and Wolseley. Read the news report below, printed in Die Burger of 9 September 1989, and summarise it. Make sure that you include all the main points.

THE NIGHT WHEN THE BOLAND MOUNTAINS RUMBLED

EARTHQUAKE: TWENTY YEARS

LATER.

When light tremors rolled over the mountains of Tulbagh, Wolseley and Ceres on the morning of 29 September 1969, few people thought that their homes and farms would be badly damaged, or even destroyed. And today, twenty years after the disastrous spring evening when an earthquake of 6.5 on the Richter Scale shook the earth here, people are still talking about it.

“It was chaos,” said Mr Dirkie Hougaard (49) of Tulbagh. I was working at the telephone exchange at the time and was alone when the earth began to rumble. But an earthquake was the last thing that I thought of. Not many people thought it was.

Shortly before ten o’clock he became worried when the rumbling became louder and more regular. Before anyone knew what was happening there was a gigantic quake. It was four minutes past ten.

“The whole earth shook. The lampshades were shaken from the roof, walls wobbled and in some places collapsed. Taps were shaken loose and water streamed everywhere. I realised that I had to run outside. Outside it looked misty as a result of the dust cloud that hung over the village. Everyone was in a panic.”

Mr Hougaard managed to start the emergency generator of the Post Office and help was summoned from the Police, Divisional Council and later the Army.

AMOUNT

Because the post office was the only place in the town that still had electricity it served as a base for rescue workers. As Mr Hougaard received telephonic information about inhabitants severely affected by the earthquake, rescuers were sent out.

“The lines were overloaded because everyone was phoning to hear what had happened and where they should go.”

Shortly after this Mr Hougaard went to have a look at his own house, which he had just bought. Although he can’t remember the exact amount, the damage caused to his house cost more to repair than he paid for the house originally.

His wife, who was expecting their second child, was cut on the head when a badminton trophy fell from the pelmet onto her head. For months after this she refused to sleep inside at night.

Mr NC Krone, owner of Twee Jonge Gezellen and vice-chairman of the Boland Disaster Committee said that most inhabitants of Tulbagh were badly affected, yet the spirit of co-operation was a wonderful memory. “Emergency aid streamed into the disaster-struck towns and a comprehensive disaster relief programme was instituted on the night of the earthquake by the Defence Force with the assistance of the Police and local authorities.”

The next day 400 tents were erected in Tulbagh, 250 in Wolseley, and 100 in Ceres. The Army erected a field hospital in Wolseley. Two days later the water shortage was relieved and new pipes were laid to the mountains to replace pipes damaged by falling rocks.

DONATIONS

Nearly all of the R13 million controlled by the Disaster Committee was spent. Almost R1.3 million was raised from public donations.

My summary:

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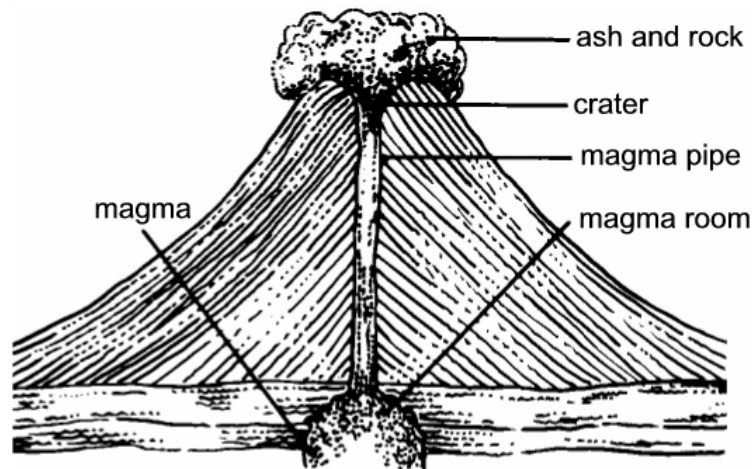
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GROUP ASSESSMENT: MODEL

1. Prescribed length was maintained.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
.....		
2. Main ideas have been identified.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
.....		
3. Main ideas have been correctly put in paragraphs.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
.....		
8. Complete sentences, good language usage and correct punctuation.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

VOLCANOES

- ▶▶ If the pressure under the mantle builds up the magma is forced through weak places and cracks in the crust. These weak places form volcanic pipes. When the magma reaches the surface of the earth it forms solid rock. This rock blocks the volcanic pipe and the pressure from below builds up. Eventually the pressure is sufficient to cause a huge explosion. The solid rock (the plug) is blown away and the magma erupts from the pipe. A volcanic explosion like this can sometimes destroy a whole town.
- ▶▶ There are fewer than 500 active volcanoes on Earth. An active volcano is one that erupts from time to time. More than half of these volcanoes are in an area around the Pacific Ocean.



The inside of a volcano

TASK 3:

Use the map of the world below and show the area where volcanoes mainly occur. Use an atlas to show where the following volcanoes are.



Mount Etna



Hawaii



Mount Pinatubo



TASK 4:

Use the previous information on volcanoes and earthquakes and define the following terms:

	TERM	DEFINITIONS
1.	Richter scale	
2.	Seismologist	
3.	Epicentre	
4.	Volcanic pipe	
5.	Active volcano	

Self assessment 5 X 2 = (10)

Activity 2.2	TO STUDY THE PROPERTIES OF THE MOON AND TO IDENTIFY THEIR INFLUENCES ON THE EARTH	LO 1.3	
		LO 2.3	

INTRODUCTION

- ▶ Earth has one moon that orbits it. The moon has no light of its own but reflects sunlight. It takes the moon 29,5 days to orbit the earth. There is no life, air, wind or water on the moon. Comets, asteroids and meteors that have collided with the moon have caused huge craters on the surface. Temperatures on the moon vary from 200 degrees Celsius to -120 degrees Celsius.
- ▶ At different times of the month the moon appears to assume different shapes. This is because the human eye sees different parts of the moon that are illuminated by the sun as the moon orbits around the earth.
- ▶ As the moon orbits, it influences the sea level as the moon has its own gravity, which affects the sea. This change in water levels is called the *tides*.

PHASES OF THE MOON

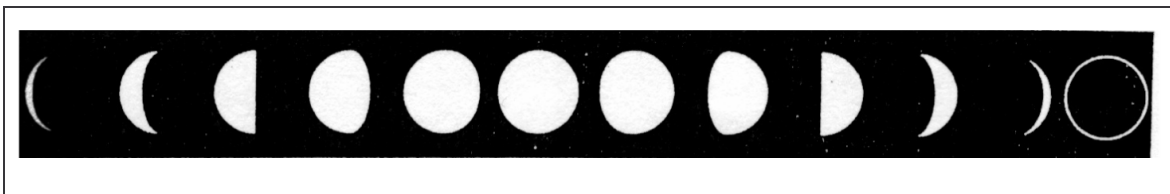
- »» When the moon is exactly between the earth and the sun it cannot be seen. This is known as a *New moon*. Thereafter the moon resembles a sickle. This is known as a *Crescent moon*. Only a small portion of the moon is visible. As the moon travels around the earth, the visible portion grows larger until the *First quarter* is reached. The sunlit area continues to grow until *Full moon*. Then the sunlit portion grows smaller until it reaches the *Last quarter* and continues to shrink until the visible portion forms the *Crescent moon* again and so on until the next *New moon*.

TIDES

- »» Because the moon is much closer to the earth than the sun it has a far greater gravitational effect on the earth. At full moon and new moon both the moon and the sun pull on the earth in the same direction. This means that the tides are higher than normal. This is known as spring tide.
- »» When the moon is in the first and last quarter the sun and the moon pull at right angles to each other. This causes tides that are lower than usual. This is known as neap tide. The earth rotates around its axis every 24 hours and so there are two high tides and two low tides every day.

TASK 5

On the sketch below supply the correct labels for the phases of the moon.



TASK 6

Read the statements below and say if they are TRUE or FALSE. If FALSE, correct the statement.

STATEMENT	T	F	CORRECTION
The moon is a satellite of the earth.	<input type="checkbox"/>	<input type="checkbox"/>	
The earth is a satellite of the sun.	<input type="checkbox"/>	<input type="checkbox"/>	
No astronauts have landed on the moon.	<input type="checkbox"/>	<input type="checkbox"/>	
A lunar eclipse doesn't occur with each full moon because most of the time the moon does not move through the earth's shadow.	<input type="checkbox"/>	<input type="checkbox"/>	
During neap tide the level of the sea is slightly higher than normal.	<input type="checkbox"/>	<input type="checkbox"/>	
The moon looks bigger than other celestial objects, because it is immensely large.	<input type="checkbox"/>	<input type="checkbox"/>	
The first and last quarters of the moon are also known as <i>Half moon.</i>	<input type="checkbox"/>	<input type="checkbox"/>	(10)

**Activity
2.3**

**TO REPRESENT THE DIFFERENT LAYERS
IN THE EARTH'S ATMOSPHERE VISUALLY
AND TO INVESTIGATE WEATHER
PATTERNS AND SEASONS**

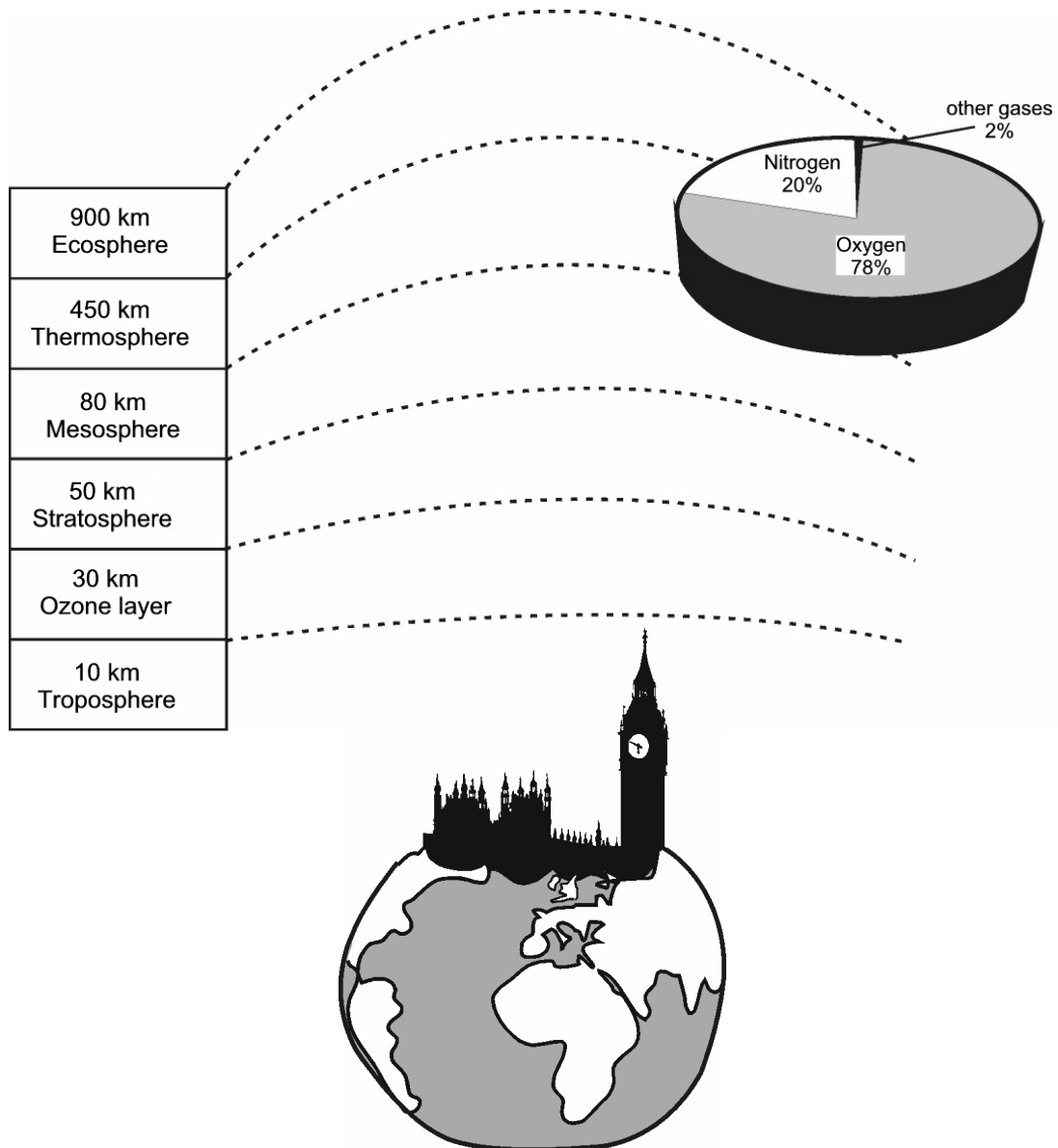
LO 2.3

LO 3.1

THE ATMOSPHERE

A layer of air called atmosphere envelops the earth. This layer usually contains two gases, namely oxygen (78%) and nitrogen (20%). The atmosphere consists of a number of layers, of which each has its own characteristics.

LAYERS IN THE ATMOSPHERE





Troposphere

This is the layer closest to Earth. Here we find all the weather patterns and clouds, and this is also where aeroplanes and birds fly.



Ozone layer

The harmful ultra-violet rays of the sun are absorbed in this layer.



Stratosphere

It is here that modern jets fly. Oxygen supply is insufficient for man to breathe.



Mesosphere

Most small meteors burn out in this layer.



Thermosphere

Most of the sun's heat is absorbed here; temperatures rise to 1 000 degrees Celsius.



Ecosphere

There is almost no air in this layer. Only the lightest of gases are found here, as well as some weather satellites.

The above-mentioned layers do not have fixed limits and we can therefore say that they intermingle. The density decreases the higher the layer is until almost no air is present. Compared to the cross-section of the earth, the atmosphere is not really a very thick layer.



TASK 8:

Group work

- ▶▶ Using the information given, make a diagrammatical representation of Earth, showing all its layers.
- ▶▶ Use different colours to distinguish between the layers.
- ▶▶ Labels must be in print.
- ▶▶ The thickness of layers must be displayed.

EDUCATOR ASSESSMENT: DIAGRAMMATICAL REPRESENTATION **1. 2. 3. 4.**

1. Aim: The message is carried over clearly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Detail: Detail is accurate and clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Sketches and illustrations: Functional and purposeful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Creativity: Representation is creative and original	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Presentation: neat and orderly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DOMINANT CODE:

MARK:/ 20%

Educator:.....

Commentary:.....
.....
.....
.....
.....

Learner: