

Samprav Man Singh Rajbhandari  
Grade 7  
School: Piet Van Vuuren  
Johannesburg, South Africa  
2018

# Science in Space and Earth References

Natural science and Technology  
- (NST)

Google and other science  
facts

Y  
ORDT: Organization for Research  
Development & Training P. Ltd

Children's Journal  
Volume 1, Issue 1, July 07, 2019

Copyrights Author and ORDT- 2019

# Science in Space and Earth

1

Revision

Blackholes Page 2-3  
Planets- Page 5-9  
Moons- Page 10-11  
Sun and Stars- page 12-14  
Solar System- page 15-16  
Rovers- Page 17-19  
First astronauts to be on space and on the moon-  
page 20-21  
Telescopes- page 22-23  
~~Life of a star page 24~~  
Galaxies- 26-27  
Origin and carbon dioxide page 28-29  
Gravity- page 30-31  
Smallest of all- 32-33  
Biggest of all- page- 34-35  
How Earth was made page- 36-37  
Inside Earth page 38-41  
Exploring space page- 42-43  
Comets, asteroids and meteors page- 44-45  
Night and Day 46-47  
The seasons page- 49-50  
~~Life of a star-~~  
The atmosphere- 51-52  
Life of a star-

Back

Samprav Man Singh Rajbhandari

Grade: 7

Piet Van Vuuren  
Johannesburg, South Africa

## Topic 1

## Blackholes

Black holes <sup>are</sup> ~~a~~ ~~gob~~ ~~of~~ ~~gas~~ that has the strongest gravitational force is so strong, nothing inside. If a star goes in there it won't escape, ~~that is~~ not even a single light. That is how it got its name. The black holes are ~~is~~ very big, it has the power to pull a massive star.

The black hole's weights

3 billion times much as the sun. The black holes

it's self ~~is~~ <sup>are</sup> ~~a~~ <sup>stars</sup> ~~stars~~. If you

travelled into the black hole your body <sup>body</sup> would be spaghettiified now

out into an incredibly long, thin strand. There are many black holes in space, many of them are very far from Milkyway and the solar system. Black holes can sing, a black hole in the perseu galaxy, 300 million light years away, has been emitting an extremely low musical sound for to billion years. Xrays can detect it, but we can hear it. Scientist say if you managed to fall right into a black hole and stay conscious you may carry on falling forever time effectively stands still, so you'd never get ~~at~~ to the bottom.

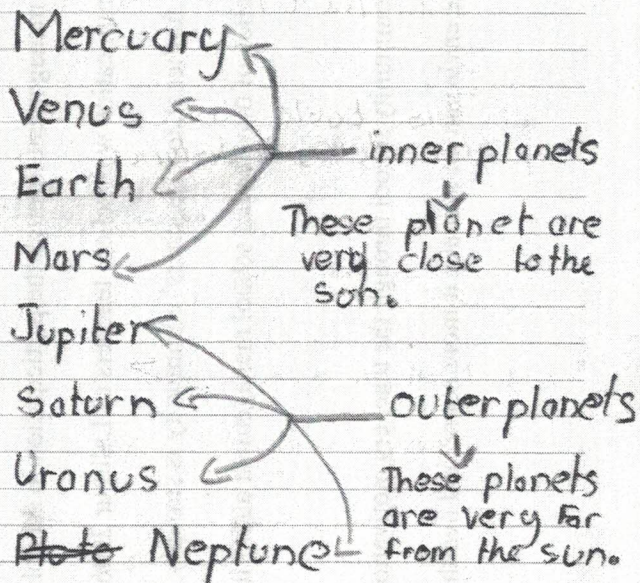
If you managed to get within  
161 kilometres 100 miles of  
a black hole, you would  
heated up to over 2,000,000°  
3,600,000 degrees Fahrenheit

Black hole

Science in Space

Topic 2  
Planets

Planets are rocky bodies that  
travel around the sun. There are  
eight planets in our solar  
System, there are:



There were nine planets in  
the solar system the name  
of the last planet was  
Pluto. Pluto was taken out of the  
solar system.

## Science in space 6

Scientist took out Pluto from the solar system because Pluto was very far, and very small and scientist could not study it. Pluto is smaller than the earth's moon. Pluto does not have its own moon.

This table below shows the diameters, distance etc.

Planet	Mercury	Venus
Diameter (km)	4878	12000
Distance from the Sun (mil km)	60 million	180 million
Position in relation to the Sun.	1st	2nd
Composition	Rocky	Rocky-atmosphere made out of carbon dioxide
Average Temperature	168	500

## Science in Space

Earth	Mars	Jupiter	Saturn
12750	6787	142800	120660
150 million	240 million	800 million	1400 million
3rd	4th	5th	6th
Rocky atmosphere of gas including oxygen	Rocky thin atmosphere	Gassy hydrogen helium	Gassy
15	-55	-145	-141

Uranus	Neptune	Mercury
5118	49529	Venus
3000 million	4500 million	Earth
7th	8th	Mars
Frozen gas-hydrogen helium and methane	Frozen gas hydrogen helium and methane	These planets are made out of Rocky surface.
-216	-218	Jupiter

are made out of frozen gas and gas.

### Special feature

Mercury- No atmosphere and no liquid water. It has ice near its north pole.  
 It does not support life

Venus - No water thick clouds not made of water atmosphere is made out of carbon dioxide traps sun's heat. Do not have moons.

Earth - Only planet that supports life known as the Blue planet. It has liquid water and ice. Do not have moons.

Mars - Red planet Very high mountains Olym pus, Jng river beds suggest there was once water.

Jupiter - All other ~~can~~ fit planets can fit in it. Fast winds storm of swirling has 3 dark rings

Saturn - So light it could float on water. Made out of frozen water.

Uranus - Axis point to the sun so appears to lie its side 9 dark and two bright colored rings.

Neptune - The last planet several dark rings very fast winds.

Scientists have found gas planets that do not have a magnetic field and rotate around space on their own. All the gas planet planets have rings. In our Solar System all the gas planet have rings. It is also the gas planets that have the most moons. The gas planets are also bigger than the rocky planets. Gas planets like Jupiter has the strongest gravitational field than the other planets.

## MOONS

Moons are rocky bodies that travel around planets. While some planets have over one hundred of moons, scientists think there are more to be found. Moons differ in great deals in size, as you can see in the examples. Some are covered in ice some are covered in rocky surface.

The moon seems to shine because light from the sun shines into its surface and light it up.

Moons do not give out their

In 1969 Neil Armstrong was the first man to step feet on the moon.

own light and heat. Only stars are made of hot gas and they can produce their own light and heat.

It takes the moon about 28 days to rotate once.

This means that in almost a month, the Moon has rotated once and the Earth 28 times. There are hundreds of moons in the solar system.

Some moons are bigger than a planet.

Ganymede, one of Jupiter's moons, is bigger than planet Mercury.

Saturn's moon Telessto has a 24 km diameter. Its surface is covered in ice.

## Sun and Stars

The sun is in the centre of the solar system. The sun is a star its actual temperature is  $6000^{\circ}\text{C}$ . Stars are balls of hot gas. They can produce their own heat and light. All the planets in the solar system revolve around the sun. The sun loses 1000 kilograms each second. The sun does not revolve or rotate around anything. There are billions of stars in our solar system galaxy.

The sun counts 98% in our solar system. The closest star in our solar system is the sun. There is a star called Alpha Hercules which is 2 million <sup>years</sup> ~~km~~ <sup>light</sup> ~~way~~ <sup>years</sup> away from the solar system. The temperature of the sun's centre is  $15,000,000^{\circ}\text{C}$  ~~degrees~~. The atmospheric pressure at the centre of the sun is 340 billion times greater than the ~~sea~~ Earth sea level ~~of~~ on Earth. The stars of the Milky Way revolve around its centre, completing one orbit every 200250 million years.

There are ~~different~~ differences between stars also. ~~There~~ They have different colors.

There are stars called:

The Blue stars

The Yellow stars

The Red stars

Our sun is a yellow star.

The biggest and the brightest is the Blue stars. The smallest is the Red stars

Each stars <sup>has</sup> ~~have~~ its own Features.

~~They are just like planets but~~

~~they are big, made out very hot~~

~~gas and they can produce~~

~~their own light.~~ The sun

is 150 million km away

from Earth. The stars are

different from planets because

the stars can produce their

own light and heat when planets can not.

Topic 5

# Solar System

The Solar System is an area in space which includes:

Sun

Mercury

Venus

Earth

Mars

Asteroids belt

Jupiter

Saturn

Uranus

Neptune

The moons are part of the solar system.

As in the previous topic we learnt that the sun is in the middle of the solar system

In the solar system Earth is only the planet that supports life. Scientist thinks that there was once water on Mars. Four planets of the solar system are gas planets and they are also called ~~the outer~~ ~~outer~~ outer planets because they are far from the sun. Mercury, Venus, Earth and Mars are inner planets because they are very close to the sun and they are made by rocky surface. Mercury and Venus does not have a moon.

It will take 2 million years to reach the very end of the solar system

Rovers are vehicle that ~~moves~~ travel through planets in space. Rovers ~~has~~ have special wheels and axles designed to travel on the moon or other planets. Rovers helps scientists to explore other objects in space more closely. A Rover is a unmanned vehicle. The Rover uses the power of the sun, The ~~power~~ <sup>energy</sup> of the that sun is called the rover takes is called solar power. Rovers have only been to the moon and Mars. Astronauts <sup>mission</sup> driven a moon rover in the Apollo (The moon mission)

History of Rovers  
Mars Rovers

1997-Pathfinder (USA)  
Sojourner the first Mars  
rover.

2004-Spirit and Opportunity,  
lands on Mars.

2012-Curiosity Mars Science  
Laboratory Rover lands  
on Mars.

Moon Rovers

1970-Lunokhod 1 Russia first  
remote controlled rover.

~~1977~~ 1971- Apollo 15 Astronauts  
used moon rovers

1972- Apollo-16 Astronauts used  
moon rovers to explore the moon

Curiosity is a size of a ~~car~~

car it has 17 cameras it

is one of the rovers, <sup>that is</sup> unmanned

~~News~~ ~~1975~~ A-

Curiosity is the rover from  
that found ~~traces~~ traces of water  
For ~~more~~ on Mars.

Rovers

Science in Space



## Topic 7

First astronauts to be

On space

First person on space - 1961

Colonel Yuri Gagarin was the first person to be in space.

He was the pilot in the Russian Air Force. His space craft was called Vostok 1.

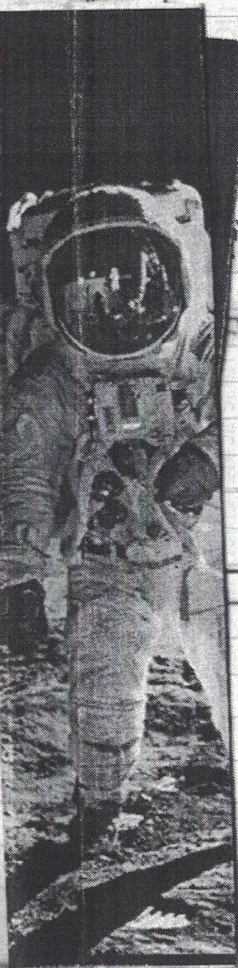
First woman in space - 1963

Many Russian and American astronauts went into space. ~~The~~ Valentina Vladimirovna Tereshkova was the

first woman on space

The first astronauts to be on the moon.

Neil Armstrong  
Michael Collins  
Edwin Buzz Aldrin



they were the people that went to the moon. The name of the mission was called the Apollo. The first person to step foot on the moon was Neil Armstrong. This in the year 21 July 1969.

First person - 1961	Colonel Yuri Gagarin
First woman - 1963	Valentina Vladimirovna Tereshkova
First astronauts to be on the moon - 1969	Neil Armstrong Michael Collins Edwin 'Buzz' Aldrin

First astronauts to be on space	Science in Space
---------------------------------	------------------

## Topic 8 Telescopes

Telescopes are objects that make small look big. Telescopes are mainly used for looking into space. There are different kinds of telescopes they are:

- Optical telescopes
- Magnification
- Radio telescopes
- Arrays

Optical telescopes are telescopes that we look through. Binoculars and camera lenses are types of optical telescopes

Magnification - ~~It~~ it makes small things look bigger.

It is the largest Telescopes

Radio telescopes. If you live where at night the night skies are clear and dark you can see many more stars stars, may be galaxies. The telescopes radio telescopes can not see but hear also

Many years ago we <sup>did not have</sup> had telescopes, we did not know much about the solar systems etc. Then an Italian scientist called Galileo Galilei invented a telescope.

Now we know more about space and our solar system because of these telescopes. The telescopes we use it for every day life is the Optical telescopes.

Topic

## Life of the star

~~Stars or Stars are created when clouds of hydrogen gas and other material fall in upon themselves due to their own weight. This happens when the gravity of a passing star. Gravity begins to release heat energy and the fragment condenses into a rotating sphere super hot gas known as a protostar. Over time, the pressure and temperature within the protostar becomes so intense that a continuous~~

~~thermo-nuclear element explosion.~~

Life of a star | science



Topic 10  
Galaxies

Galaxies are a spot of big hole in the universe which contains stars, planets and asteroids. There are many galaxies in the universe, there may be billions if you see them ~~with~~ with the telescopes. We live in a galaxy called the Milky Way which also has a black hole. Many astronomers believe the universe was made 15 billion years ago but there are <sup>many</sup> more things to find out.

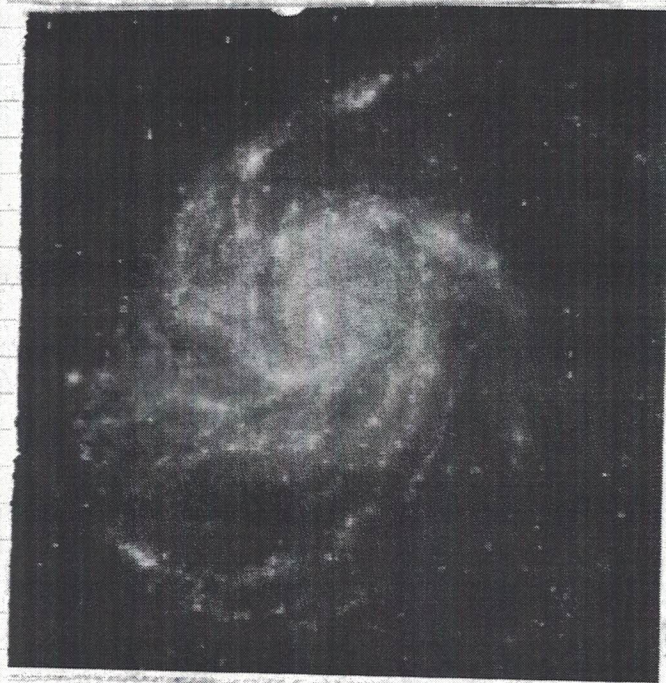
Names of other galaxies

Milky Way  
Spiral galaxy

There are also other galaxies

Galaxies

science in space



Topic II

# Oxygen and Carbon dioxide

As you know that Earth is ~~the~~ the only planet that has <sup>life</sup> ~~the~~ <sup>in</sup> the solar system. Oxygen is a gas which gives life to animals and human being. There is 79% of Nitrogen, 20% of Oxygen and 1% of other gases. We must not cut trees because trees gives us Oxygen. Oxygen has no color, taste or smell. **If** there is Oxygen ~~there is~~ and ~~1~~ <sup>many</sup> molecules of hydrogen there is water

known as ~~the~~ the ( $\text{CH}_2\text{O}$ ).

Carbon dioxide ~~the~~ ~~it~~ does not give life. Carbon dioxide comes by air pollution and etc. Trees ~~so~~ ~~it~~ take in carbon dioxide and take out Oxygen. There is some kind of trade between trees and animals.

Carbon dioxide can be controlled by growing more trees and not polluting air. This gas should not be more than oxygen otherwise all living things on earth will die. Trees make their food by taking in Carbon dioxide.

## Topic 12

## Gravity

Gravity is a force that causes things to fall towards earth. The moon has a very low gravitational force. If there was no gravity we would fly around. It is because of the moon we have waves on the ocean. Jupiter has the most gravitational pull. Jupiter helps us from getting hit by an asteroid, but if asteroids keep on hitting Jupiter, ~~the~~ it will take everything that is front of it.

The earth does not collide to other planets because magnetic force. Example: North and North cannot connect, South and South cannot connect but North and South can connect on a magnet. Every planet has its gravity. Even moons in the solar system. The planets ~~and~~ ~~revolve~~ revolve around the sun because magnetic force. The Earth's ~~is~~ ~~is~~ gravitational force is 9.6 strengths when Jupiter has more than that. Sir Issac Newton ~~found~~ ~~was~~ was the first person to say that gravity is the ~~main~~ main source of attraction towards the earth.

Topic 13

## Smallest of all

Tiny Pluto is so far away it was discovered until 1930. In 2006, Pluto was classed as a dwarf planet. It is less than half the width of the next smallest planet, Mercury. In fact Pluto is smaller than our Moon. Dwarf planet Pluto is the farthest planet from the sun. If you were to stand on the surface, the sun would not look much brighter than the other stars. It gets very little heat from the sun and its surface is completely covered with solid ice.

Space probes have not yet visited Pluto. So astronomers will have to wait for close pictures and detailed information that a probe could send back. Even if one was sent to Pluto it would take at least eight years to travel there. No one knew Pluto had a moon until 1978. An astronomer noticed what looked like a bulge on the side of the planet. It turned out to be a moon and was named Charon. Charon is about half the width of Pluto. Mercury is also a small planet than the Earth but it is bigger than Pluto.

Topic 14  
The biggest of all

Jupiter is the biggest planet, more massive than all the other planets in the solar system put together. It is 11 times as wide as the Earth although it is still much smaller than the Sun. Saturn is the next largest planet, it is more than nine times as wide as the Earth. Jupiter and Saturn are gas giants. They have no solid surface or a spacecraft to land on. All that you see ~~now are~~ the tops of

The ~~Great~~ Great Red spot on Jupiter is a 300 year old storm. It was first noticed about 300 years ago and it is twice as wide as Earth. It rises above above the rest of the clouds and swirls around like storm clouds on Earth. Jupiters moon (Io) looks a bit like a pizza. It ~~has~~ has many activities volcanoes that throw out huge plumes of material making red blotches and dark marks on its orange-yellow surface.

Topic 15

## How Earth was made

Scientists think that Earth was formed because of a huge cloud of gas and dust around 4500 million years ago. A star near the cloud exploded making the cloud spin. As the cloud spun around, gases gathered at its centre and formed the sun and stuck together to form lump of rock. In time the rocks crashed into each other and made of planets. The Earth is one of these planets.

- 1 - Cloud starts to spin
- 2 - Dust gathers into lump of rock which formed a small planet
- 3 - Earth begins to cool and hard shell forms
- 4 - Volcanoes erupted raising gases to form the first atmosphere
- 5 - The Earth was made up of large pieces of land how split into seven chunks of continents

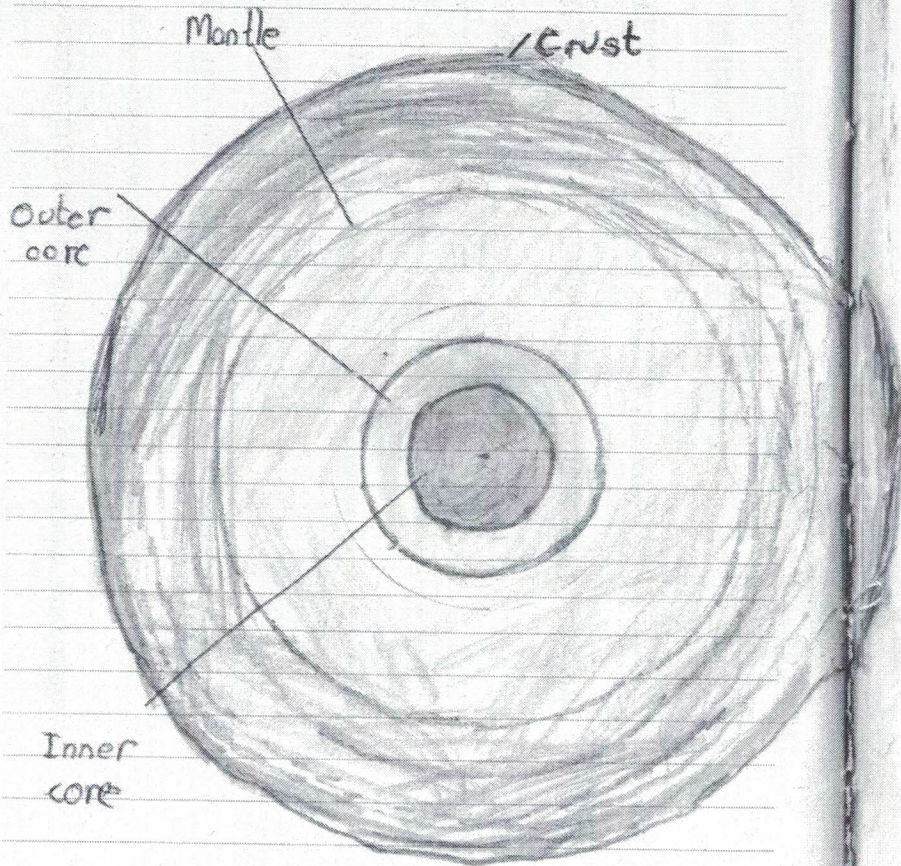
It took many years to take this process.

How Earth was made | Science in Space

Topic 16

# Inside the Earth

There are different parts of Earth.



Crust - 13°C - 15°C
Mantle - 4500°C
Outer core - 6000°C
Inner core - 7000°C

At the centre of the Earth is a huge metal ball called the inner core it is 2500 kilometers wide and mainly from iron and some nickel. The ball has an incredible temperature it is 7000°C - hot enough to make the metal melt. Around the centre the Earth flows a hot liquid layer of iron and nickel. This layer is the outer core and is about 2200 kilometers thick. As the Earth spins the metal ball and the liquid

moves at different speeds.

The largest part of the Earth is a layer called the mantle, which is 2900 kilometers thick. Its lines between the core and the crust. Near the crust, the mantle is made of slow-moving rock. When you squeeze an open tube of toothpaste, the toothpaste moves a little like the rock in the upper mantle.

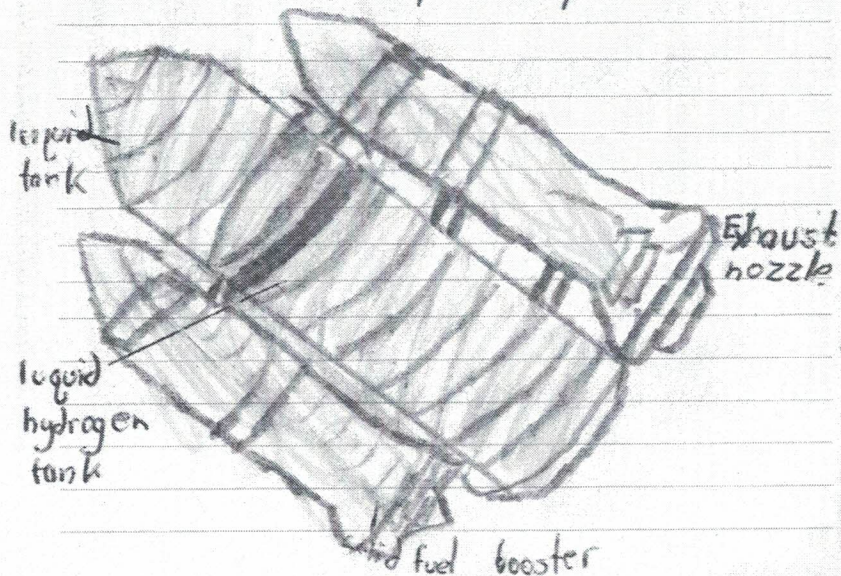
The Earth's surface is covered by crust. Land is made of continental crust between 20 to 70 kilometers thick. Most of this is made from a rock called

granite. The ocean bed is made of oceanic crust about 8 kilometers thick. It is made mainly from a rock called basalt. The crust is divided into huge slabs of rock called plates. Most plates have land and seas on top of them but some, like the Pacific plates, are mostly covered by water. The large areas of land on the plates are called continents. There are several continents - Africa, Asia, Europe, North America, South America, Oceania and Antarctica.

Topic 17

## Exploring space

Rockets that are powerful can fly into space. There is no air or oxygen in space. Rockets have powerful engines to help them get out of the atmosphere. It takes many years to build a rocket that can explore space.



Today the exploration of space is still going on. Some space crafts are now re-usable. They are called space shuttles. To launch a space craft attached to a huge fuel tank and two rocket boosters. When the shuttle is 45 kilometers above the Earth, the rocket boosters fall away. This happens two minutes after the blast off. Eight minutes after blast off all the fuel tank has been used up and the fuel tank falls away when the space craft has been used up flying on its own.

## Comet, asteroids and meteors

### Comets

There are billions of tiny comets at the edge of our Solar System. They revolve the sun and far beyond Pluto. Some comets comes back to the sun regularly, such as Halley's comet that returns every 76 years.

### Asteroids

Asteroids are chunks of rock failed to stick together to make a planet. Most of them

circle the sun between Mars and Jupiter which is called a asteroid belt. There are millions of asteroids, some the size of a house and others as big as mountains.

### Meteors

Meteors are sometimes called a shooting stars. They are not really stars, just streak of light that flash across the night sky. Meteors are made when pebbles racing through space at the high speed hit the top of air above the Earth.

Comets are bigger than asteroids  
and asteroids are bigger than  
meteoroids.

Comets, asteroids and meteoroids	Science in space
----------------------------------	------------------

## Night and day

The Earth is like a big spinning top. It continues to spin because it was formed from a spinning cloud. It does not spin straight up like a top but leans a little to one side. It takes 24 hrs to revolve ~~the sun~~ once. Each part of the ~~sun~~ Earth spins towards the sun, and then away from it every day. When a part of Earth is facing the sun it is day. When a part of Earth is facing away from the sun it is night-time. The Earth spins around its poles. The Earth spins around two points on its surface. They are opposite ends of the Earth.

One is on top of the ~~ice~~ Earth top of Earth and at the bottom it lies the opposite. The top is known as ~~South~~<sup>North</sup> Pole and the other South Pole. They are covered with ice and snow. The spinning of Earth acts like a magnet. At the centre of Earth is liquid iron. As the Earth spins, it makes the iron behave like a magnet with the north pole and the South pole. ~~These~~ These act on the magnet in a compass to make the needle point to the North and the ~~South~~ South Poles.

## The Seasons


There are Four Seasons, they are:

Spring

Winter

Summer

Autumn

The reason for the seasons lies in space. Our planet Earth plots a path through space that takes it around the  Sun. This path, or orbit, takes one year. The Earth is tilted, so over the year first one and then the other pole leans towards the sun, creating seasons. Northern winter and the southern hemisphere is tilted towards the sun. At the north pole, the sun never disappears below the horizon at Midsummers day.

A day can last 21 hours.

Night and day happens because Earth is spinning as it circles the sun.

At the highest of summer, places near the north pole are so tilted towards the sun that it is light almost all day long. In Stockholm, Sweden, mid summer Eve lasts 21 hours because the sun disappears below the horizon for only three hours.

Deciduous trees lose their leaves in autumn, but evergreens keep their leaves all year around. When the sun shines all day in the far North there is 24 hour night in the far south.

## Atmosphere

The layers of the atmosphere

The atmosphere is divided into five layers. The lowest is the troposphere, contains most of the materials in the atmosphere, and most of the weather system.

It extends to 18km above the equator.

Layers	Temperature
Troposphere	-60°
Stratosphere	-60°
Mesosphere	0°
Thermosphere	-100°
Exosphere	1500

Hot and cold

The atmosphere is warmed by radiation

from the Sun, but it is not an even temperature.

## Wind and rain

All the clouds, snow and rain happens because of Rain and water evaporating evaporation from the Earth's oceans. The water is carried upwards by rising air currents until it meets colder air and condenses into clouds, which may produce rain or snow. The air masses over the poles and tropical regions are in constant conflict. They meet over the oceans, giving rise to constantly changing weather patterns which are blown by the prevailing winds across the water towards the land

## Science in Space

Information to write

this book:

- Science words
- True Fact information
- Correct History
- Information about all the topics
- Information of all planets
- All the information related to space.
- Correct names of pictures and photographs.

This word science was first used in the 14th century and means knowledge in Latin.

This Book will help you learn more about Space and Science.

This world is full of science including space, it will help you to know the meaning and tell others about the true facts of science.

This book will tell how planets, stars etc were made.

# Science in Space and Earth

Revision

- Blackholes Page 2-3
- Planets- Page 5-9
- Moons- Page 10-11
- Sun and Stars-page 12-14
- Solar System- page 15-16
- Revers- Page 17-19
- First astronauts to be on Space and on the moon- page- 20-21
- Telescopes- page 22-23
- ~~Life of a star- page 24~~
- Gaxies- 26-27
- Origen and carbon dioxide page 28-29
- Gravity- page 30-31
- Smallest of all- 32-33
- Biggest of all- page- 34-35
- How Earth was made page- 36-37
- Inside Earth page 38-41
- Exploring space page- 42-43
- Comets, astroids and metroids page- 44-45
- Night and Day 46-47
- The seasons page- 49-50
- ~~Life of a star-~~
- The atmosphere- 51-52
- life of a star-

**Samprav Man Singh Rajbhandari**  
**Grade 7**  
**School: Piet Van Vuuren**  
**Johannesburg, South Africa**  
**2018**

*ORDT: Organization for Research Development & Training P. Ltd*  
*Children's Journal*  
*Volume 1, Issue 1, July 07, 2019*  
*Copyrights Author and ORDT- 2019*