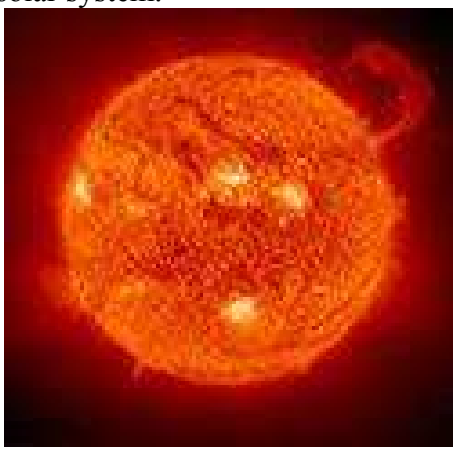
UNIT 1: EARTH AND THE SOLAR SYSTEM.

STAR INFO CARD

Name: THE SUN.
Age: About 4.5 billion years.
Location: At the center of our solar system.
Average distance from Earth: 149,600,000 km.
Diameter: 1,390,000 kilometers.
Mass: 1.99 x 10^{30} kg.
Distinguishing features: The Sun, an ordinary star, contains more than 99.8% of the total mass of our solar system.



PLANET INFO CARD

Name: MERCURY.
Age: About the same age as the Sun.
Location: Solar System.
Avg. Distance from The Sun: 58,340,000 km.
Diameter: 4880 Kilometers.
Mass: 3.30 x10^{23} kg.
Orbital period around the Sun: 0.24 Earth years (88 Earth days).
Number of moons: 0.
Distinguishing features: Temperature variations on Mercury are the most extreme in the solar system ranking from –170º C to 430º C.

PLANET INFO CARD

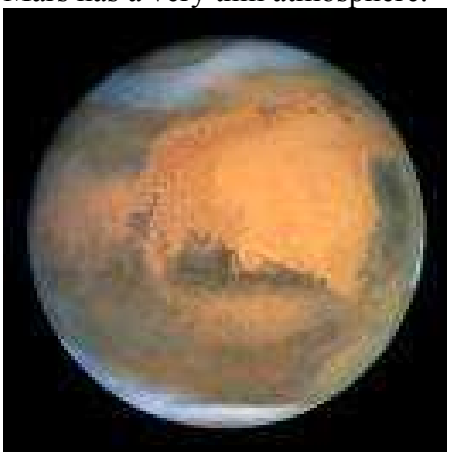
Name: VENUS.
Age: About the same age as the Sun.
Location: Solar System.
Avg. Distance from The Sun: 108,200,000 km.
Diameter: 12,100 km.
Mass: 4.869 x 10^{24} kg.
Orbital period around the Sun: 0.616 Earth years (225 Earth days).
Number of moons: 0.
Distinguishing features: Thick clouds containing sulfuric acid hide the rocky surface.

PLANET INFO CARD

Name: EARTH.
Age: About the same age as the Sun.
Location: Solar System.
Avg. Distance from The Sun: 149,600,000 km.
Diameter: 12,760 km.
Mass: 5.972 x 10^{24} kg.
Orbital period around the Sun: 1 year (365 days)
Number of moons: 1.
Distinguishing features: Earth is the only planet to have liquid water on its surface.

PLANET INFO CARD

Name: MARS.
Age: About the same age as the Sun.
Location: Solar System.
Avg. Distance from The Sun: 227,900,000 km.
Diameter: 6794 km.
Mass: 6.4219 x 10^{23} kg.
Orbital period around the Sun: 1.88 Earth years (687 Earth days).
Number of moons: Mars has two moons: Deimos and Phobos.
Distinguishing features: Known as the Red Planet, Mars has a very thin atmosphere.



PLANET INFO CARD

Name: JUPITER.
Age: About the same age as the Sun.
Location: Solar System.
Avg. Distance from The Sun: 778,300,000 km.
Diameter: 143,000 km.
Mass: 1.900 x 10^{27} kg.
Orbital period around the Sun: 11.86 Earth years (4330 Earth days).
Number of moons: Júpiter has more than 60 moons. The moon most important is Ganymede.
Distinguishing features: Ganymede is the largest moon in our solar system (larger than even the planet Mercury).

PLANET INFO CARD

Name: SATURN.
Age: About the same age as the Sun.
Location: Solar System.
Avg. Distance from The Sun: 1,429,000,000 km
Diameter: 120,500 km.
Mass: 5.69 x 10^{26} kg.
Orbital period around the Sun: 29.46 Earth years (10,750 Earth days).
Number of moons: Saturn has more than 50 moons.
Distinguishing features: Saturn´s most distinctive feature is the thousand of rings that orbit the planet.

PLANET INFO CARD

Name: URANUS.
Age: About the same age as the Sun.
Location: Solar System.
Avg. Distance from The Sun: 2,871,000,000 km
Diameter: 51,120 km.
Mass: 8.683 x 10^{25} kg.
Orbital period around the Sun: 84 Earth years (30,660 Earth days).
Number of moons: Uranus has more than 20 moons.
Distinguishing features: The blue-green color of the planet is due to methane in the atmosphere.

PLANET INFO CARD

Name: NEPTUNE.
Age: About the same age as the Sun.
Location: Solar System.
Avg. Distance from The Sun: 4,504,000,000 km
Diameter: 49,530 km.
Mass: 1.0247 x 10^{26} kg.
Orbital period around the Sun: 164.8 Earth years (60,150 Earth days).
Number of moons: Neptuno has more than 10 moons.Its the largest moon, Triton, is almost as large as Earth´s moon.
Distinguishing features: Neptuno is smaller in diameter than Uranus, but larger in mass.

PLANET INFO CARD

Name: PLUTO.
Age: About the same age as the Sun.
Location: Solar System.
Avg. Distance from The Sun: 5,914,000,000 km
Diameter: 2340 km.
Mass: 1.27 x 10^{22} kg.
Orbital period around the Sun: 247.7 Earth years (90,410 Earth days).
Number of moons: Pluto has three moons.
Distinguishing features: Pluto was the smallest planet until August 2006, when the International Astronomical Union reclassified it as a dwarf planet.

MOON INFO CARD

Name: THE MOON.
Age: About the same age as Earth.
Location: Solar System.
Avg. Distance from The Earth: 384,400 km.
Diameter: 3476 km.
Mass: 7.35 x 10^{22} kg.
Orbital period around the Sun: 27 Earth days.
Distinguishing features: The Moon has no atmosphere or magnetic field.

OUR SOLAR SYSTEM

What is the solar system?
Our solar system consists of:

- One central star, the Sun.
- Eignt planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.
- More than 140 moons.
- Millions of rocky asteroids.
- Billions of icy comets.

Other objects in the solar system

COMETS AND ASTEROIDS

A NEW MNEMONIC USED TO REMEMBER THE PLANETS IN ORDER IS, “MY VERY EDUCATED MOTHER JUST SERVED US NACHOS”

M y	**M**ercury.
V ery	**V**enus.
E ducated	**E**arth.
M other	**M**ars.
J ust	**J**upiter.
S erved	**S**aturn.
U s	**U**ranus.
N achos	**N**eptune.

FIND THE NAMES OF THE EIGHT PLANETS HIDDEN IN THIS TABLE.

V	**M**	**E**	**R**	**C**	**U**	**R**	**Y**
E	**C**	**O**	**N**	**O**	**G**	**R**	**J**
N	**A**	**S**	**T**	**T**	**U**	**L**	**U**
U	**R**	**A**	**N**	**U**	**S**	**A**	**P**
S	**T**	**T**	**I**	**L**	**O**	**N**	**I**
E	**N**	**U**	**T**	**S**	**E**	**N**	**T**
H	**T**	**R**	**A**	**E**	**K**	**I**	**E**
D	**S**	**N**	**M**	**A**	**R**	**S**	**R**

Complete the next wordsearch and then search their definitions.

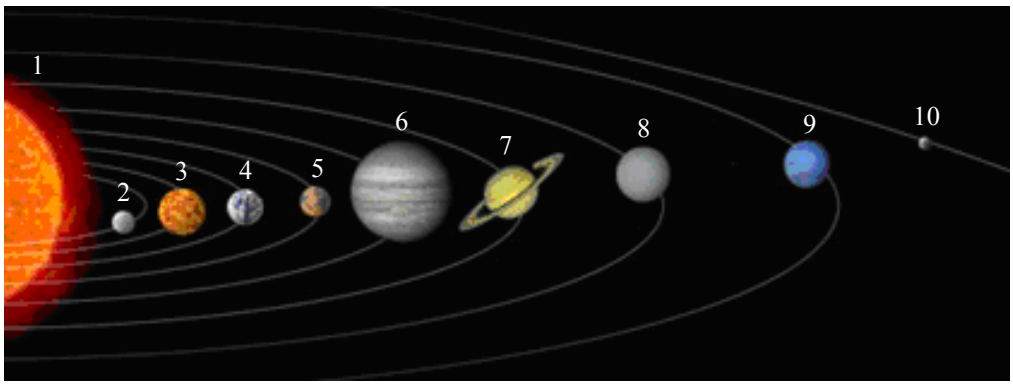
Completa la siguiente sopa de letras y luego asocia sus definiciones.

R	B	I	O	T	H	E	D
M	I	L	K	Y	W	A	Y
G	G	O	S	T	A	R	S
G	B	M	O	O	N	T	U
G	A	L	A	X	Y	H	N
U	N	I	V	E	R	S	E
A	G	P	L	A	N	E	T

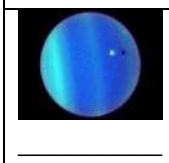
Big Bang	**Our star**
Earth	**A lighted body**
Galaxy	**An unlighted body**
Milky Way	**Our word**
Moon	**Our satellite**
Planet	**Our planet**
Star	**The beginning**
Sun	**A conjunct of stars**
Universe	**Our galaxy**

See the picture and complete the bodies of the solar system. Translate them.

Mira el dibujo y completa los cuerpos del sistema solar. Tradúcelos.



- ☐ **Sun**
- ☐ **Venus**
- ☐ **Mars**
- ☐ **Saturn**
- ☐ **Neptune**
- ☐ **Mercury**
- ☐ **Earth**
- ☐ **Jupiter**
- ☐ **Uranus**
- ☐ **Pluto**

Name	Age	Location	Distance	Diameter	Mass	Orbital periods	Features
 The Sun	4.5 billion years	_____ _____ _____	_____ Kilometres (from the Earth)	_____Km	_____x _____ kg	None	
 _____	_____ _____ _____	Solar System	_____ Kilometres (from the Sun)	4.880 Km.	_____x _____ kg	_____ Earth years _____ Earth days	
 _____	_____ _____ _____	_____	_____ _____ (from the Sun)	_____Km	_____x _____ kg	_____ Earth years _____ Earth days	
 _____	4.5 _____ _____ _____	_____System	_____ _____ (from the Sun)	_____Km	_____x _____ kg	_____ Earth years _____ Earth days	Earth is the only planet to have liquid water on its surface.
 Mars	_____ _____ _____	_____	_____ _____ (from the Sun)	6.794 Km.	_____x _____ kg	_____ Earth years _____ Earth days	
 _____	_____ _____ _____	_____	_____ _____ (from the Sun)	_____Km	_____x _____ kg	_____ Earth years _____ Earth days	
 _____	4.5 billion years	Solar_____	_____ _____ (from the Sun)	_____Km	_____x _____ kg	_____ Earth years _____ Earth days	
 _____	_____ _____ _____	_____	_____ _____ (from the Sun)	_____Km	_____x _____ kg	84 Earth years 30.660 Earth days	
 Neptune	_____ billion years	_____	_____ _____ (from the Sun)	_____Km	_____x _____ kg	_____ Earth years _____ Earth days	

What planet has the greatest diameter?

Mark your results on the graph

Kilometers	+4.000	+5000	+10000	+50000	+80000	+ 100000	+ 110000	+ 120000	+ 130000	+ 140000	+ 150000
Mercury											
Venus											
Earth	**X**	**X**	**X**								
Mars											
Jupiter											
Saturn	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**			
Uranus											
Neptune											

What planet has the greatest mass?

Mark your results on the graph

Kg											
Mercury											
Venus											
Earth											
Mars											
Jupiter											
Saturn											
Uranus											
Neptune											

Mathematics: Practicing with Large Numbers

Distances between Planets Table

Planet	Mean Distance From Sun (millions of miles)	Mean Distance in AU	Mean Diameter (miles)
Mercury	36.0	0.39	3,031
Venus	67.1	0.72	7,521
Earth	92.9	1.00	7,926
Mars	141.5	1.52	4,221
Jupiter	483.4	5.20	88,734
Saturn	886.7	9.54	74,566
Uranus	1,782.7	19.14	31,566
Neptune	2,794.3	30.06	30,199
Pluto	3,666.1	39.53	1,450

In the United States, people use **miles** instead of **kilometres** to measure large distances. There are 1.6 kilometres in a mile. So, to convert from miles to kilometre you have to multiply the number of miles by 1.6. So, 10 miles would be 16 kilometres.

How many kilometres are in 25 miles? 50 miles? 136 miles?

To convert kilometres into miles we have to divide the number of kilometres by 1.6 so, 16 kilometres divided by 1.6 equals 10 miles.

How many miles are in 25 kilometres, 100 kilometres, and 255 kilometres?

Mercury is 57.6 million kilometres away from the sun.

Venus is 107.6 million kilometres away from the sun.

Our planet earth is 148.64 million kilometres away from the sun.

Mars is 226.4 million kilometres away from the sun.

Júpiter is 773.44 million kilometres away from the sun.

Saturn is 1418.72 million kilometres away from the sun.

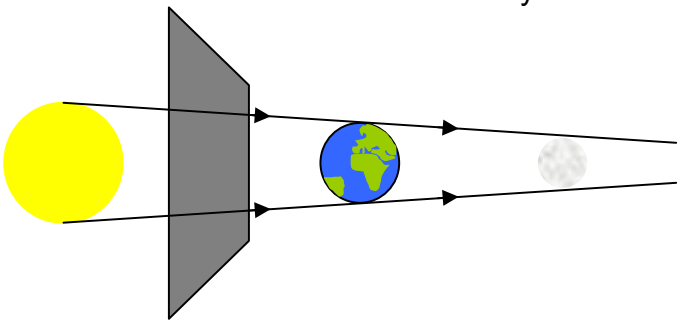
Uranus is 2852.32 million kilometres away from the sun.

Neptune is 4470.88 million kilometres away from the sun. That's far!

1. Which planet is closest to the sun?

2. Which planet is furthest from the sun?

3. If the **Earth** is 93 million miles away from the sun.



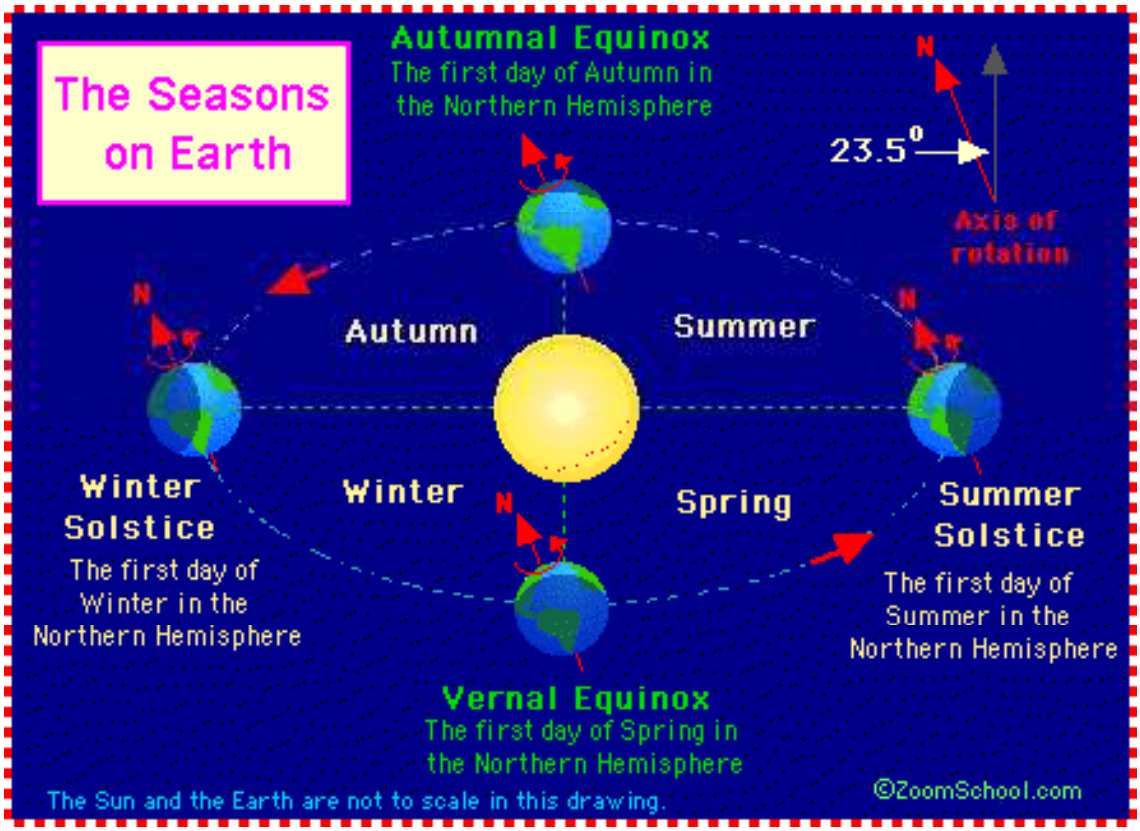
Jupiter is 483.4 million miles away from the sun.

How many miles apart are Jupiter and the Earth from each other?

4. Uranus is 2852.32 million kilometres from the sun. Neptune is 4470.88 million kilometres from the sun. How far is Uranus from Neptune?

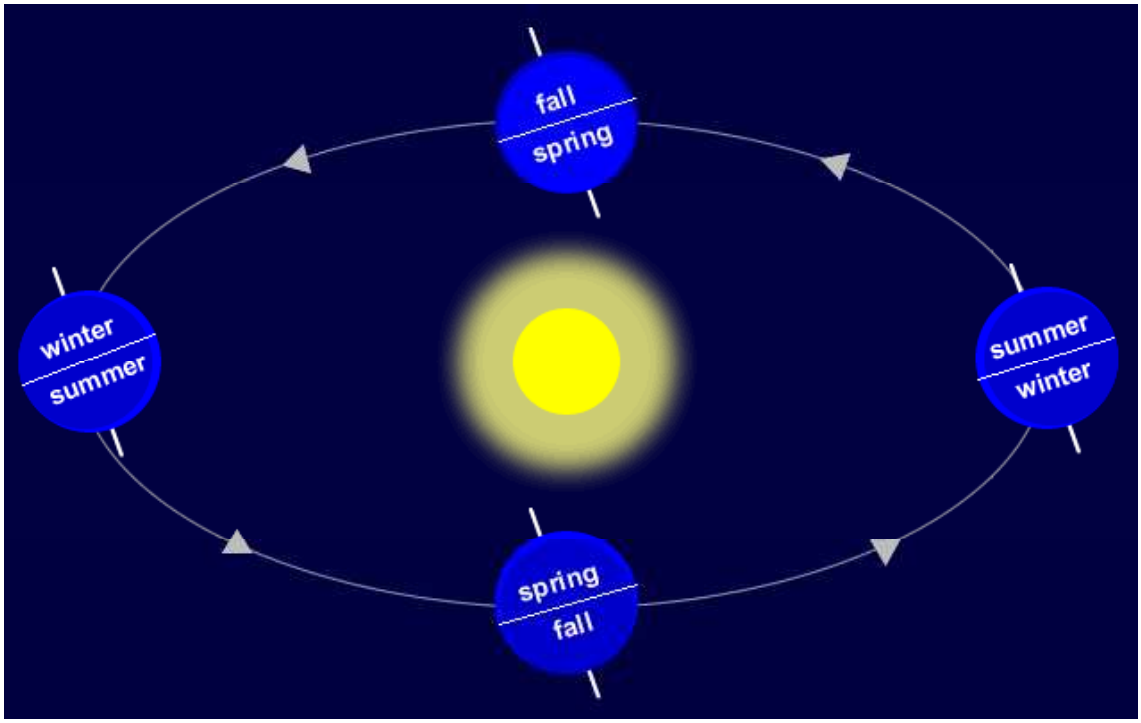
DAY, NIGHT AND THE SEASONS

We know the Earth orbits the Sun, but it also spins as orbits it. We call this spinning movement rotation. It takes the Earth 24 hours to make one complete rotation, and this gives us day and night.



It takes the Earth one year to orbit the Sun. The Earth is not upright, it is tilted. When the North Pole end of the Earth´s axis is tilted towards the Sun, it is summer in the Northern hemisphere. The days are long and the nights are short. At this time the South Pole is tilted away from the Sun, and it is winter in the Southern hemisphere. When the North Pole is tilted away from the Sun, it is winter in the Northern hemisphere. The days are short and the nights are long.
In spring and autumn (or fall), the Earth is still tilted, but not directly towards or away from the Sun. As a result, the days are about as long the nights.

Look at the picture and observe the differences between Northern and Southern hemisphere.



Answer the questions.

1. What is *rotation*?
   _____
   _____
2. How long does it take to the Earth to make one complete rotation?_____
3. How long does it take the Earth to orbit the Sun?_____
4. What season is it in the Northern hemisphere when the North Pole is tilted towards the Sun?_____
5. When are days and nights the same length?_____

FILL IN THE BLANKS.

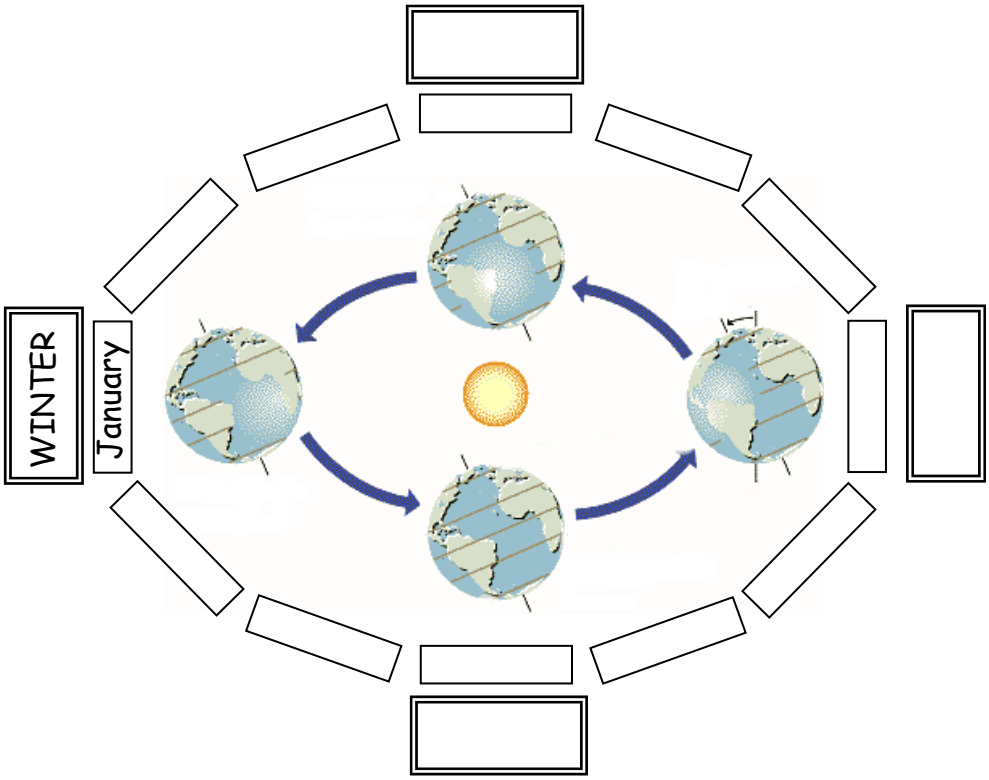
-night -day -24

The Earth takes _____ hours to rotate on itself. This movement

causes us to have _____ and _____.

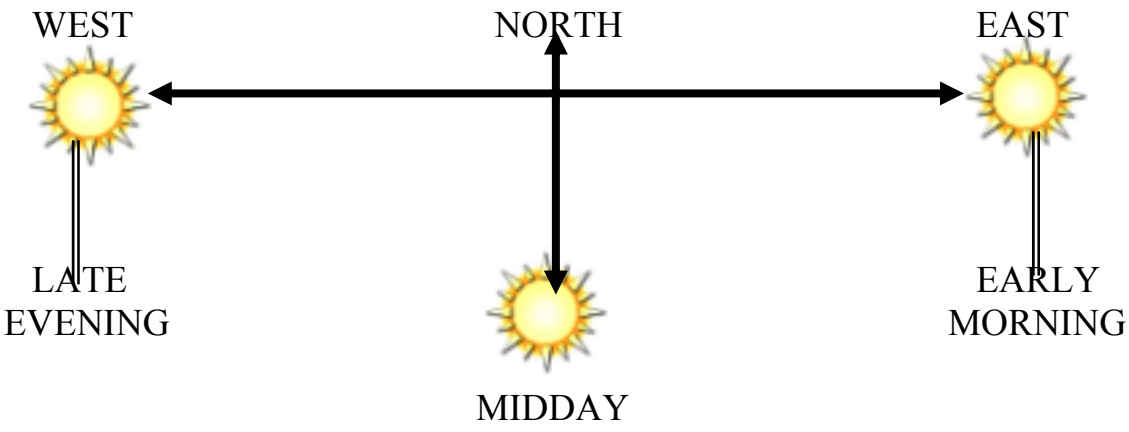
Look at the picture and write the four seasons for a person living in the north hemisphere (spring, summer, autumn, winter) and the twelve mouths of a year.

Observa el dibujo y escribe las cuatro estaciones para una persona que viva en el hemisferio norte (primavera, verano, otoño invierno) y los doce meses del año.



FINDING YOUR WAY: THE FOUR CARDINAL POINTS.

When we go out into the countryside, we can find our way by looking at the sun or by using a compass.



Every morning, the sun rises in the East. When you know which direction is East, it is very easy to find the other directions. When you face the Sun at midday, you are facing South. When you face the Sun at sunset, you are facing West.

The needle of a compass always points in the same direccion. One end always points north and the other end always points south.

Complete the sentences with the words below:

Points * rises * compass * moss * sets

1. We can use the sun or a _____ to find our way.
2. The sun_____ in the east.
3. The sun_____ in the west.
4. A compass needle_____ north and south.

Read the clues and answer the questions:

1. It is early morning. You are standing with your back to the sun. In which direction are you facing?

   _____

2. It is evening. You are standing with your back to the sun. In which direction are you facing? _____

LET´S INVESTIGATE

Use an encyclopedia or the internet.
Find information to complete the sentences below.
Name three countries in each category below.

The equator is
_____

Countries north of the equator:
_____
_____

Countries south of the equator:
_____
_____

Observe the diagram and indicate the four cardinal directions. Complete the following phrases with (on the right hand side of, on the left hand side of, in front of, behind). Translate them.

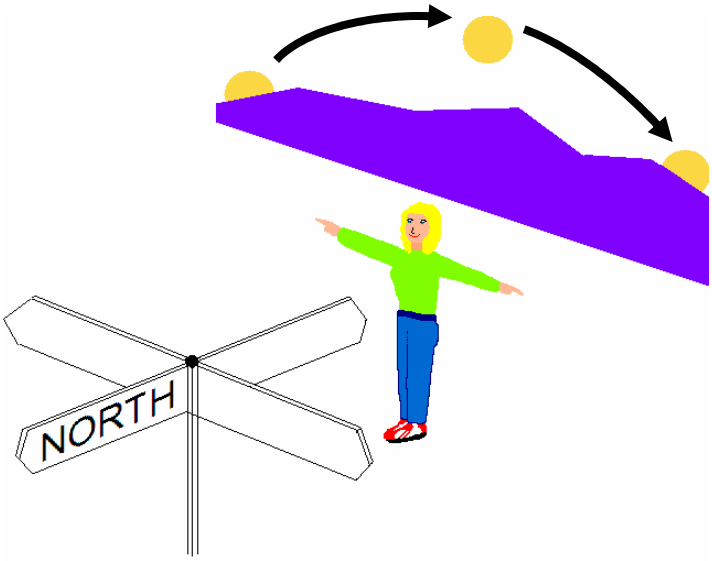
Observa la figura e indica los cuatro puntos cardinals. Completa las siguientes frases con (a mano derecha, a mano izquierda, en frente de, detrás de). Tradúcelas.

North is …… the girl.

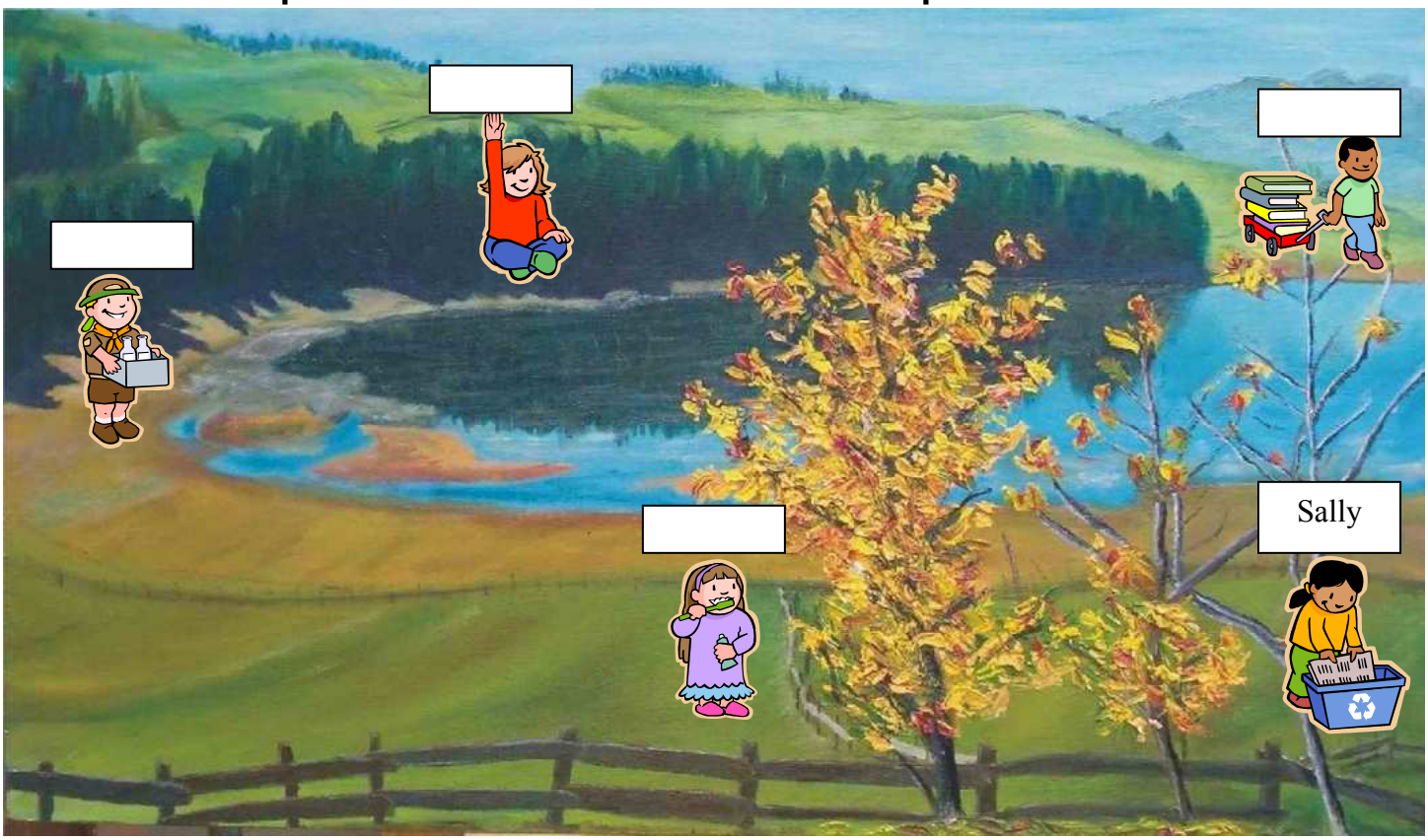
South is …… the girl.

The Sun rises in the east.
East is …….. the girl.

The Sun sets in the west.
West is ……. the girl.



Look at the picture, and read descriptions. Write each person`s name in the correct place.



1. Joe is: South of the trees and East of the lake.
2. Megan is: South of the lake, North of the fence and West of Sally.
3. Dennis is: North of the lake and West of the trees.
4. Rachel is: North of the lake, South of the trees and East of Dennis.

Where is Sally? Use the direccions and the place to describe where she is.

Sally is south of_____

When you walk out of your door, what can you see...

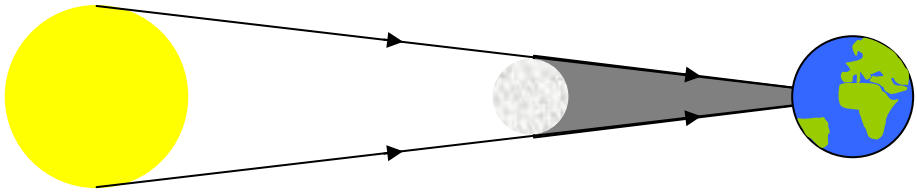
- in the North?_____
- in the South?_____
- in the East?_____
- in the West?_____

Eclipses

Use these prepositions in the following phrases: From Behind Between.

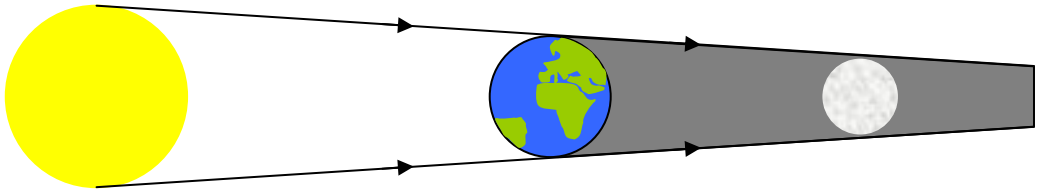
Usa las preposiciones en las frases siguientes: Desde Detrás de Entre.

a) During a solar eclipse, the moon is……the Earth and the Sun.
……. the Earth, the Sun is …… the moon.
Durante un eclipse solar, la Luna está … la Tierra y el Sol. … la Tierra, el Sol está … la Luna.



Use these prepositions in the following phrases: **From** **Behind** **In front of**.
Usa las preposiciones en las frases siguientes: Desde Detrás de En frente de.

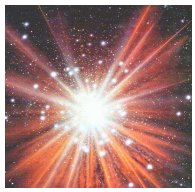
b) During a lunar eclipse the Earth is……..……. the moon and the Sun.
…….the moon, Earth is ……the Sun.
Durante un eclipse lunar la Tierra está … la Luna y el Sol. …la Luna, la Tierra está … el Sol.



Circle the correct sentence:

1º The universe …

a) … is static
b) … is expanding
c) … is contracting
d) … doesn't move



2º We live in a galaxy called….

a) Universe
b) Milky Way
c) The solar system
d) Earth

3º The second planet of the system solar is …

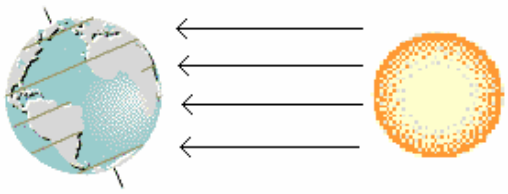
a) Mercury
b) Venus
c) Mars
d) Saturn

4º The biggest planet of the solar system is …

a) Venus
b) Earth
c) Jupiter
d) Uranus

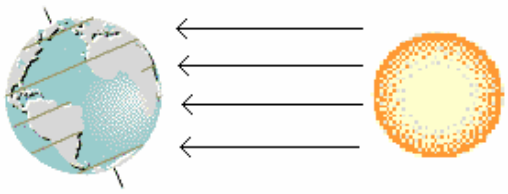
5º In the north hemisphere it's…

a) Spring
b) Summer
c) Autumn
d) Winter

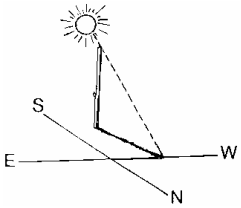


6º And in the south hemisphere it's…

a) Spring
b) Summer
c) Autumn
d) Winter

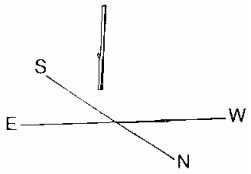


7º What time is it?



a) It's 8 o'clock in the morning
b) It's 12 o'clock in the afternoon
c) It's 2 o'clock in the afternoon
d) It's 7 o'clock in the evening

8º At eight o'clock in the morning the shadow is in …



a) The north
b) The south
c) The west
d) The east

9º In a solar eclipse …

a) The sun is between the earth and the moon.
b) The moon is between the sun and the earth.
c) Venus is between the earth and the sun.
d) The Earth is between the Sun and the Moon.

10º In a lunar eclipse …

e) The Sun is between the Earth and the Moon.
f) The Moon is between the Sun and the Earth.
g) Venus is between the Earth and the Sun.
h) The Earth is between the Sun and the Moon.

INTERNET RESOURCES

http://www.windows.ucar.edu/tour/link=/earth/climate/climate.html&edu=elem

http://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html

http://www.youtube.com/ignitelearning

http://seds.lpl.arizona.edu/nineplanets/nineplanets/nineplanets.html

http://www.nasa.gov/audience/forkids/kidsclub/flash/index.html

http://www.nasa.gov/audience/forstudents/k-4/index.html

http://www.kidsastronomy.com/solar_system.htm

http://spaceplace.nasa.gov/en/kids/games.shtml

http://www.frontiernet.net/~kidpower/astronomy.html

BIBLIOGRAPHY

http://www.nineplanets.org

Burlington Cross – Curricular Material for ESO – Social Science 2007

On-line dictionary

www.dictionary.com

On-line encyclopaedia

http://en.wikipedia.org/wiki/Main_Page

CLIL Information (links, how to create activities, resources)

http://www.isabelperez.com/clil.htm

Links and CLIL activities

http://www.richmondelt.com/clil/

Vocabulary Building

http://www.scholastic.com/kids/homework/maggie_science.htm

Science labelling – students are given 30 seconds to 'study' diagram then click and drag to right place (Earth, flowers, fish, respiratory system, atmosphere)

http://www.eflnet.com

Click on Vocabulary section. Wide range of vocabulary activities (click on correct photo, click and drag, multiple choice, listen and click) Also includes hangman game and 'slang' section.

http://www.edhelper.com/

Material for Maths, Science, Music, Social Studies and more. Click on subject then go the 'theme units' for a variety of topic and lessons (Note: American English)

http://www.studystack.com/

Word lists, games, matching activities for secondary school Maths, Science, History and Geography. Click on subject, pick topic and click on activity (flashcards, wordsearch, matching, hangman etc.)