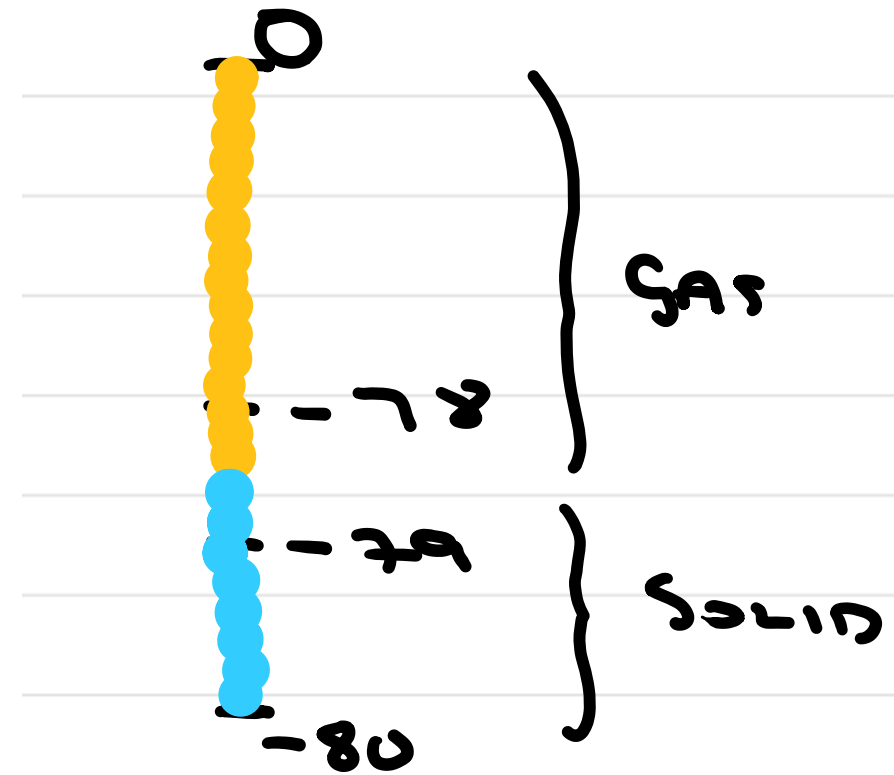


1	2											3	4	5	6	7	0				
		Key																			
		<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> 1 H hydrogen 1 </div>																			
		<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> relative atomic mass atomic symbol name atomic (proton) number </div>																			
7 Li lithium 3	9 Be beryllium 4											11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10				
23 Na sodium 11	24 Mg magnesium 12											27 Al aluminium 13	28 Si silicon 14	31 P phosphorus 15	32 S sulfur 16	35.5 Cl chlorine 17	40 Ar argon 18				
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	63.5 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36				
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	[97] Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 I iodine 53	131 Xe xenon 54				
133 Cs caesium 55	137 Ba barium 56	139 La* lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86				
[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	[267] Rf rutherfordium 104	[270] Db dubnium 105	[269] Sg seaborgium 106	[270] Bh bohrium 107	[270] Hs hassium 108	[278] Mt meitnerium 109	[281] Ds darmstadtium 110	[281] Rg roentgenium 111	[285] Cn copernicium 112	[286] Nh nihonium 113	[289] Fl flerovium 114	[289] Mc moscovium 115	[293] Lv livermorium 116	[293] Ts tennessine 117	[294] Og oganesson 118				

* The Lanthanides (atomic numbers 58 – 71) and the Actinides (atomic numbers 90 – 103) have been omitted.

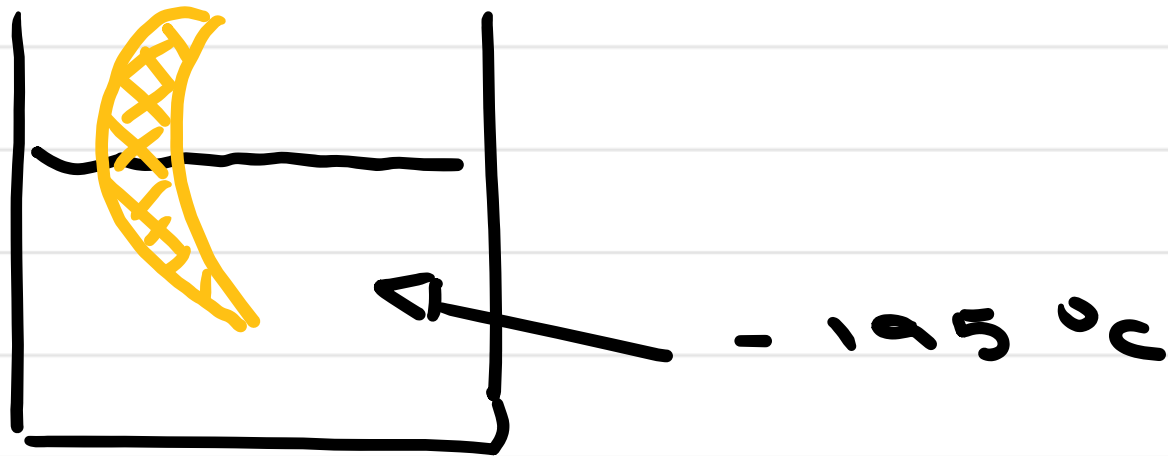
Relative atomic masses for **Cu** and **Cl** have not been rounded to the nearest whole number.

Smoky drink!!



Solids \rightleftharpoons Gas
Subliming
"Dry Ice"

Liquid Nitrogen : -195°C



OVERNIGHT

Cucumber



Freezer

THAW



Room

THE
NEXT
DAY

Earth and Space

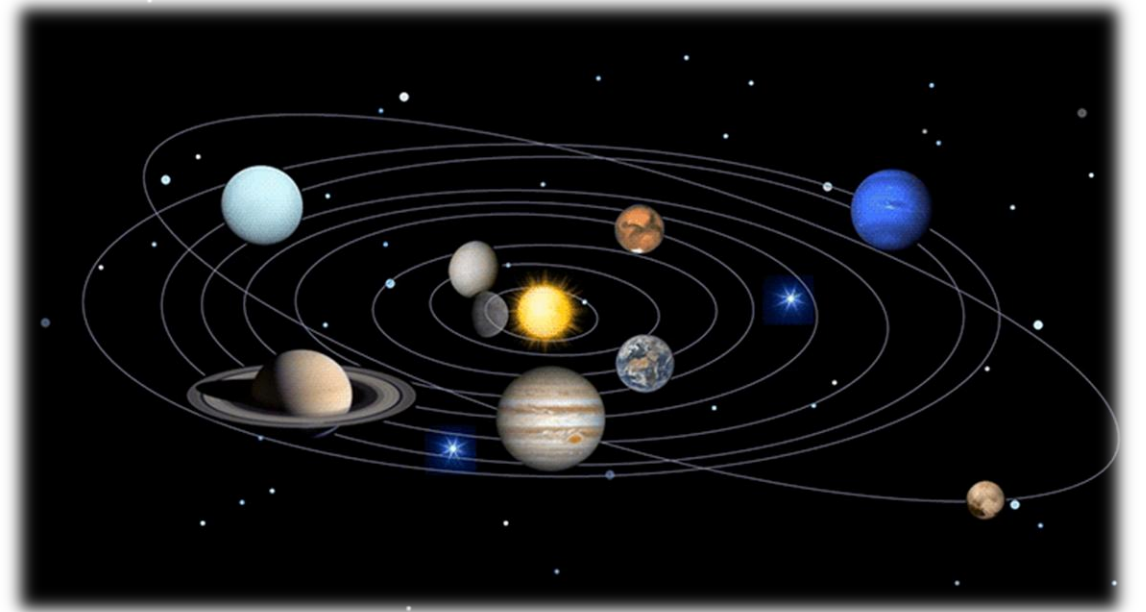
The Earth

The Moon

The solar system

Asteroids and comets

Space explorers



The Earth

How does the Earth spin?

Why do we get different seasons?

Why does the Sun appear low on the horizon in Winter?

What is the equator?

365 $\frac{1}{4}$ DAYS

Time Taken For Earth
To Orbit The Sun

28 DAYS

Time Taken For Moon
To Orbit The Earth

24 HOURS

Time Taken For Earth
To Spin Once On
Its Axis

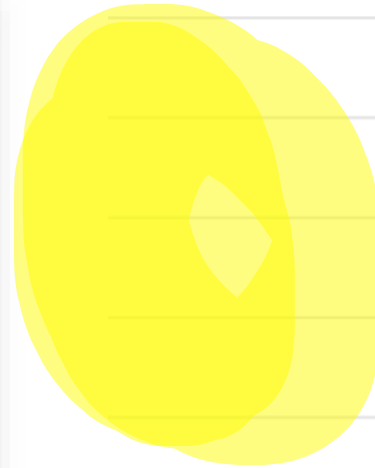
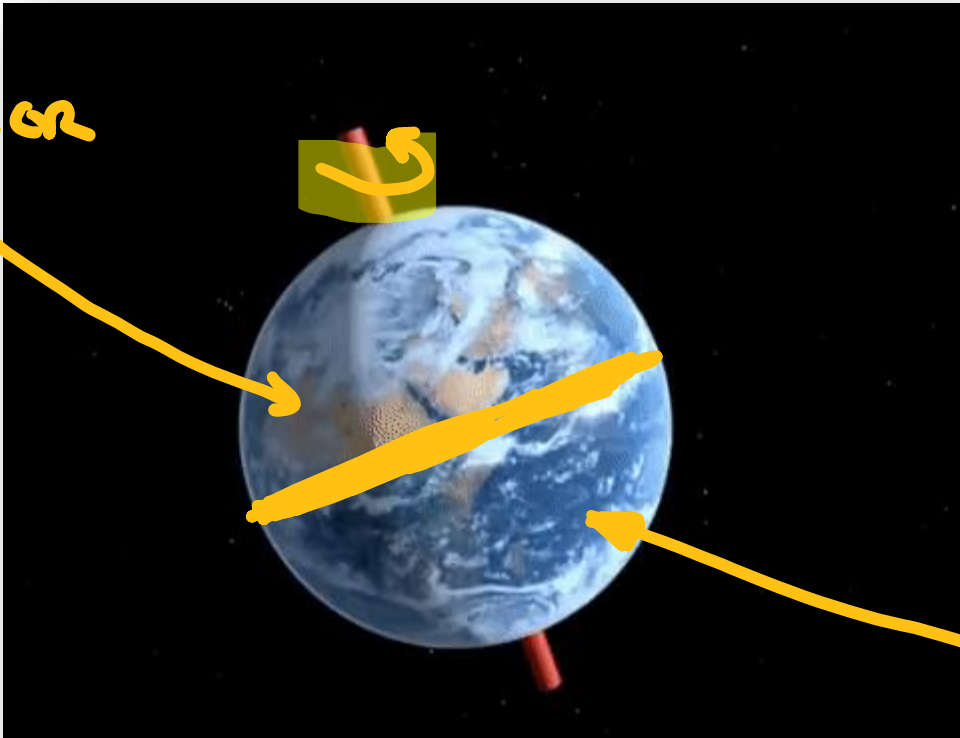
The Earth spins on its own Axis

Sun Rises in EAST

Mid-Day - Highest Position
South

NIGHT - Sets in
WEST.

Duller



Brighter

How long does it take the Earth to spin once on its axis?

365

$\frac{1}{4}$



Time Taken For Earth To Orbit Sun ONCE

28



Time Taken For Moon (satellite) To Orbit Earth

24

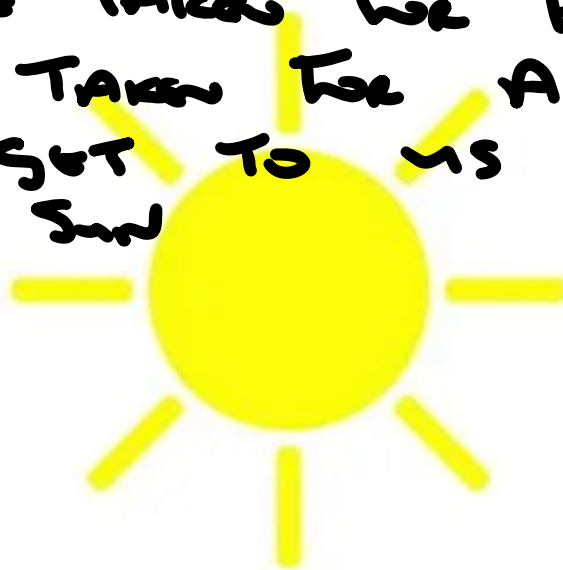


Time Taken For Earth To Spin ONCE

$8\frac{1}{2}$



Time Taken For A Photon To Get To us From The Sun

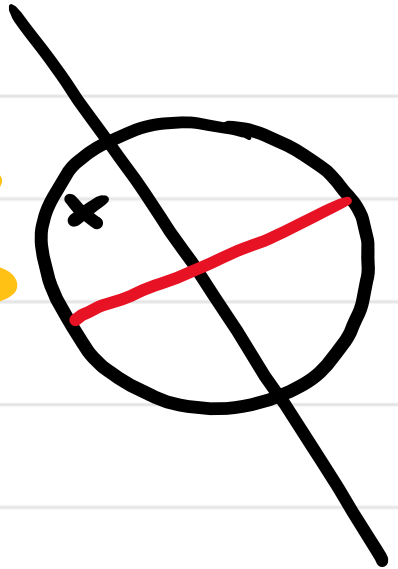
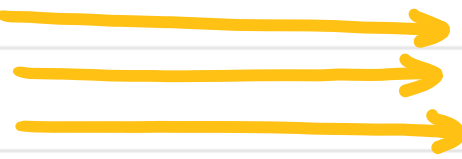
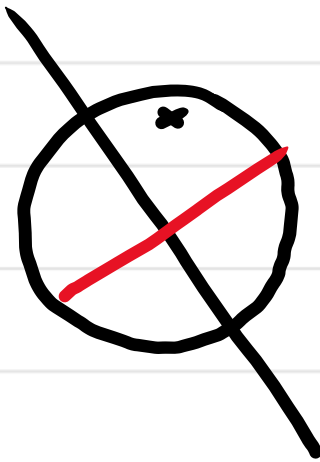


6 months

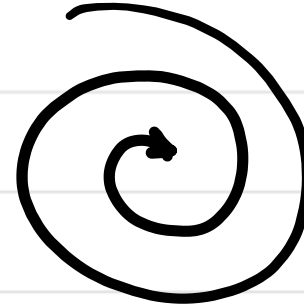


Summer

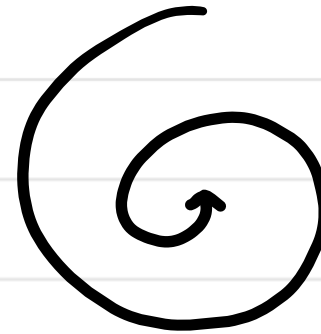
Winter



Why is the Sun high on the horizon in Summer?

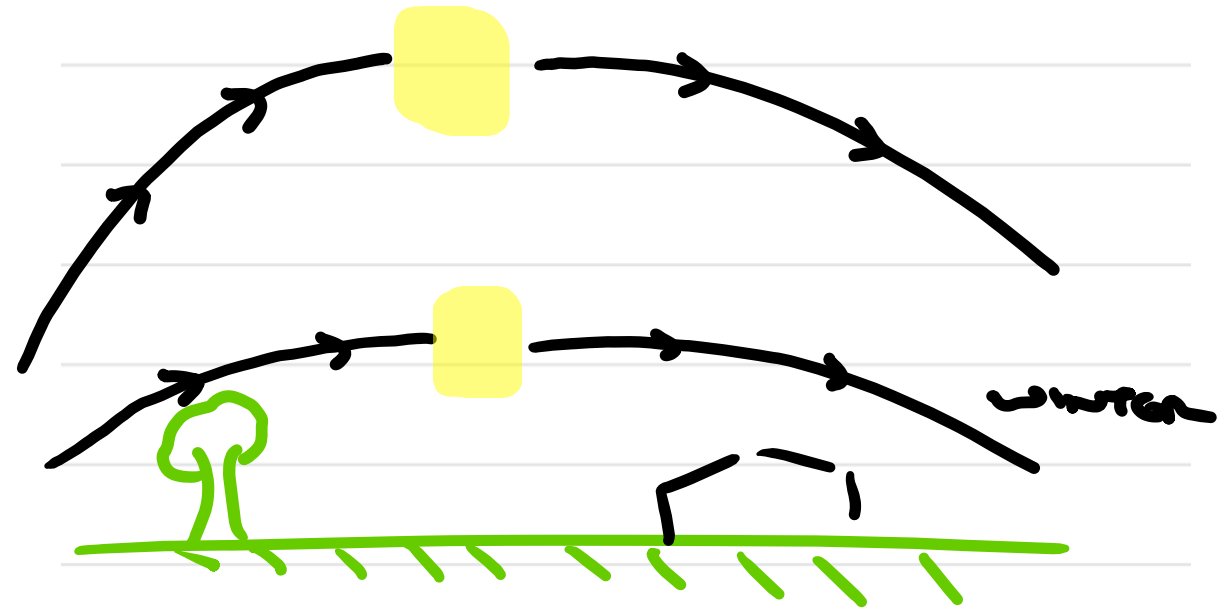


WATER FLOWS
IN OPPOSITE
DIRECTION

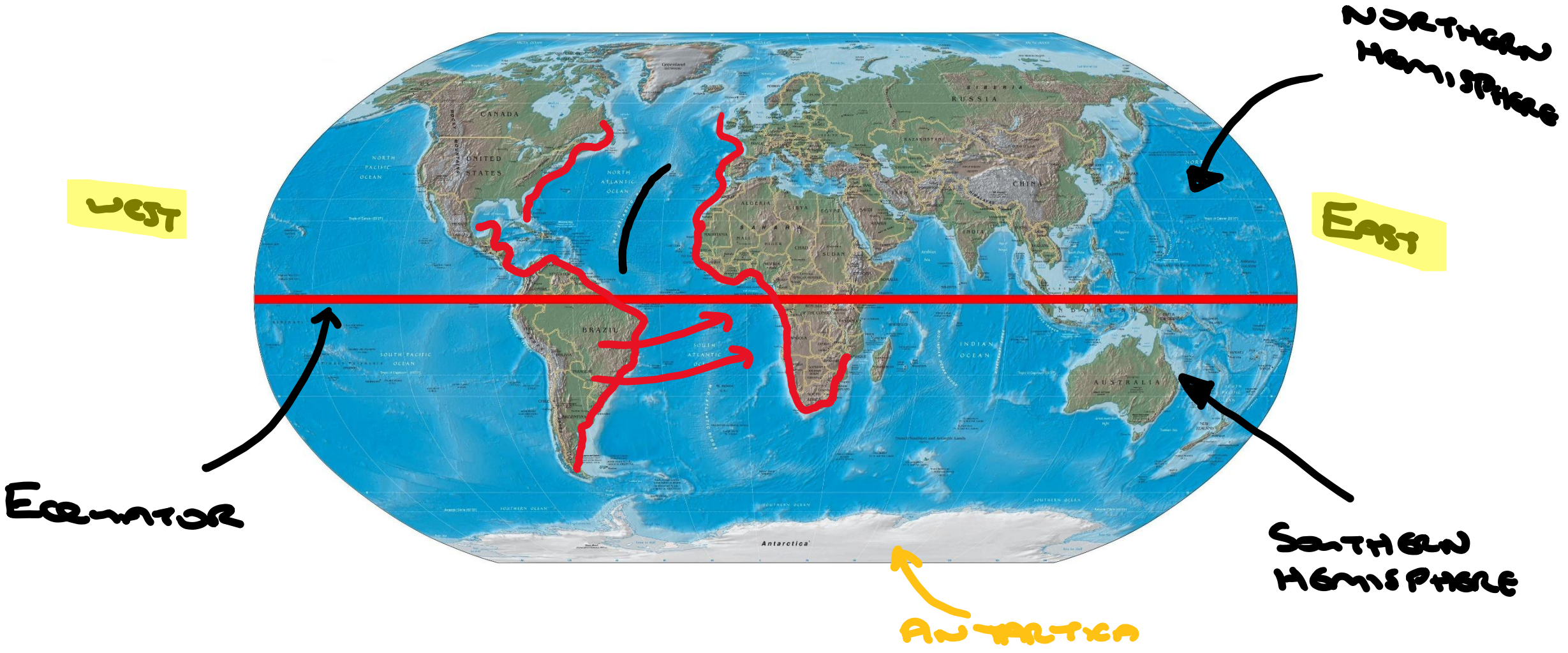


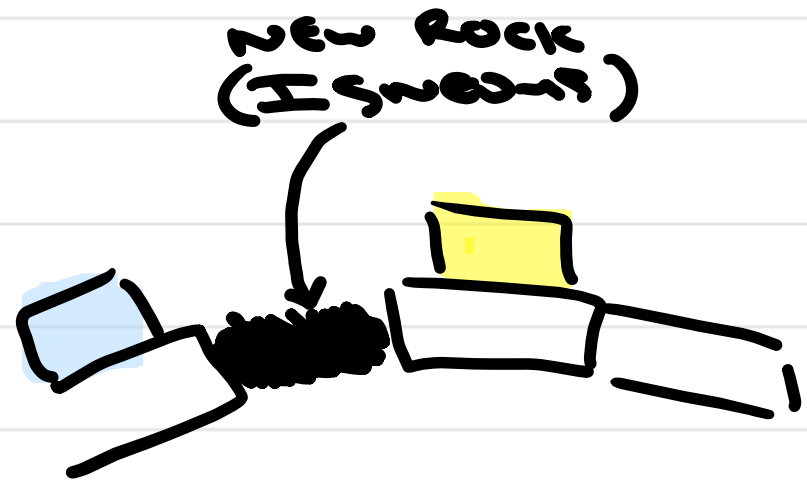
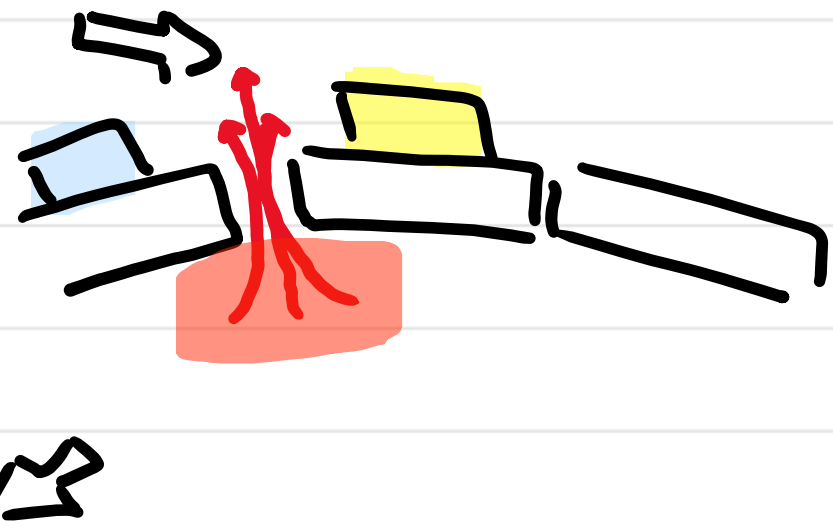
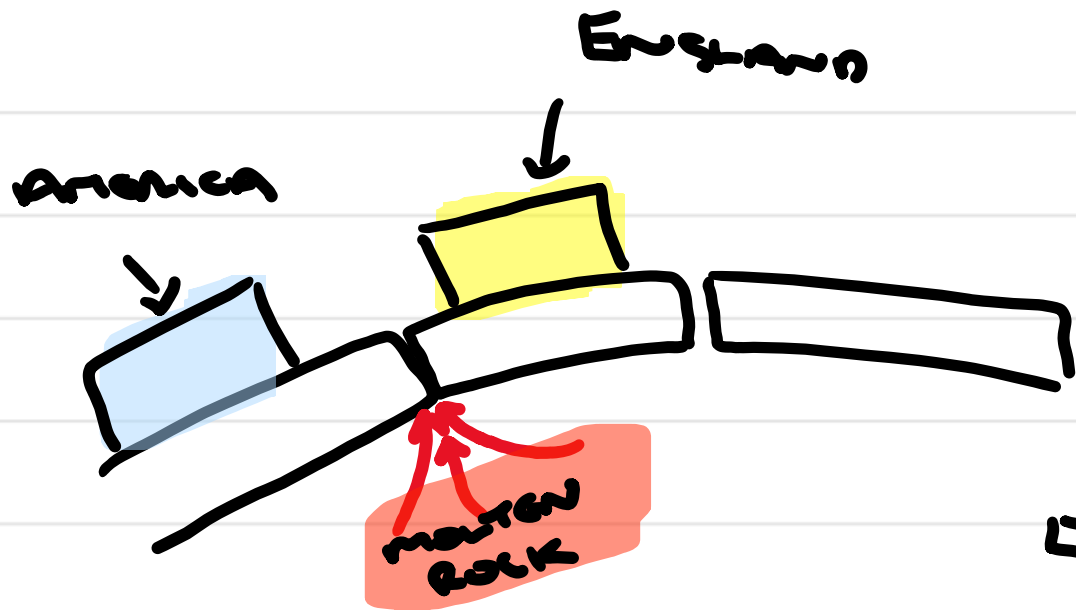
IN THE
SOUTHERN
HEMISPHERE

Why is the Sun low on the horizon in Winter?

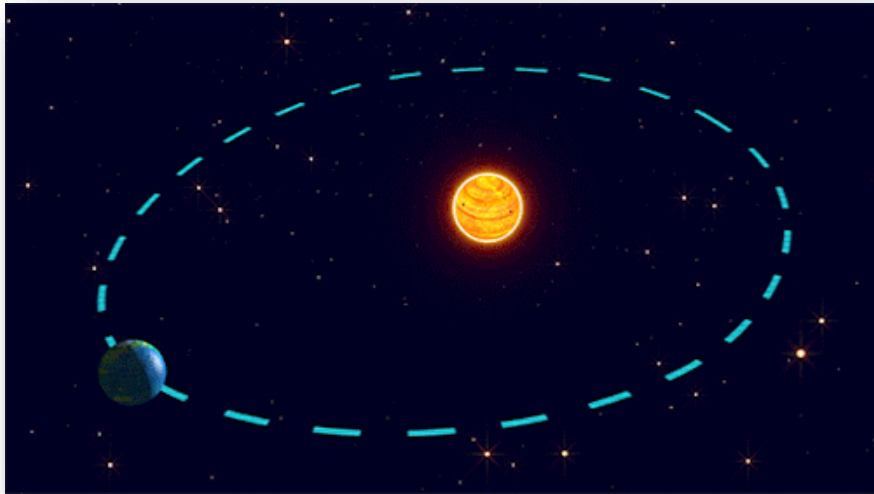


The equator

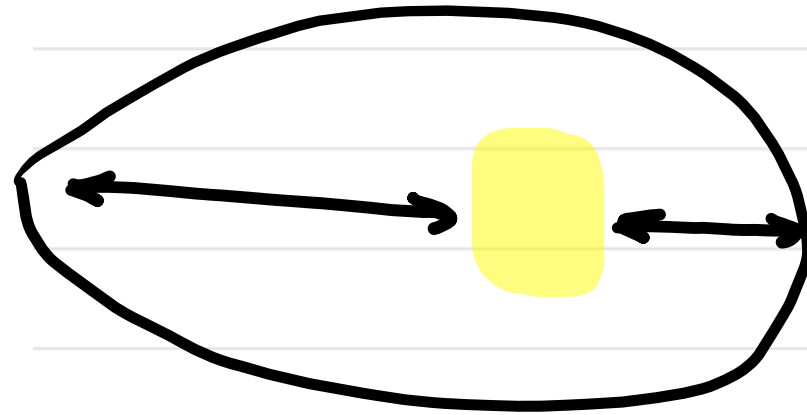
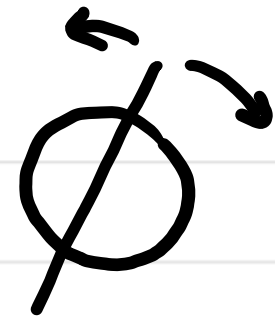




Planets orbit stars



How long does it take for the Earth to orbit the Sun?



ELLIPTICAL ORBIT

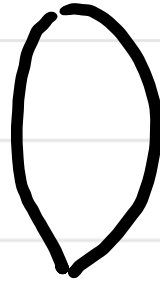
Why does the Moon appear to have different shapes?



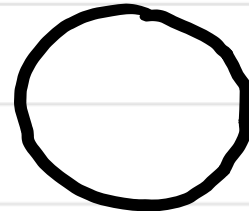
CRESCENT MOON



HALF MOON



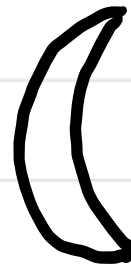
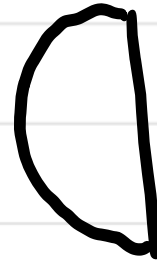
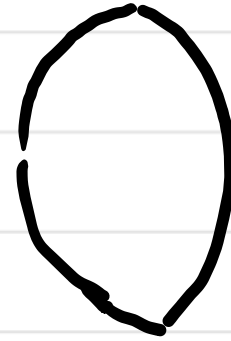
GIBBOUS



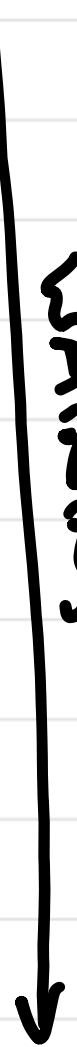
Full moon

MAXIMUM
14 DAYS

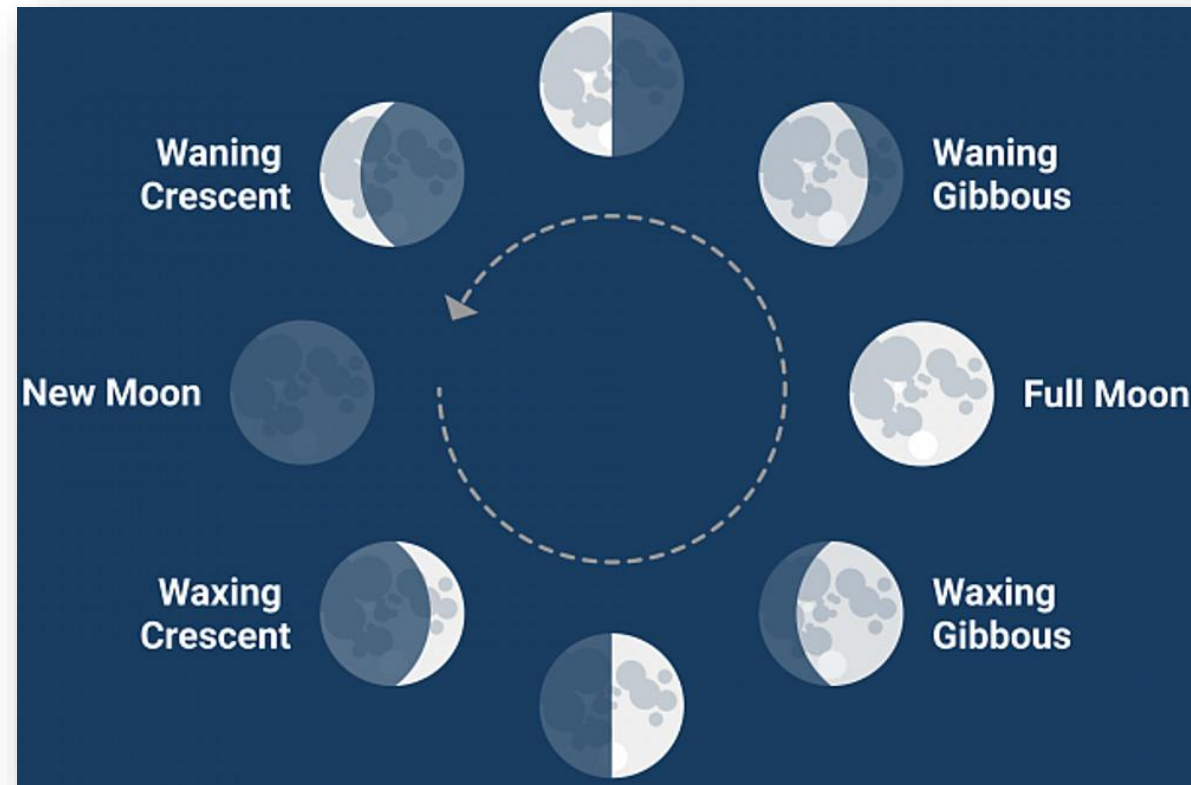
Why does the Moon appear to have different shapes?

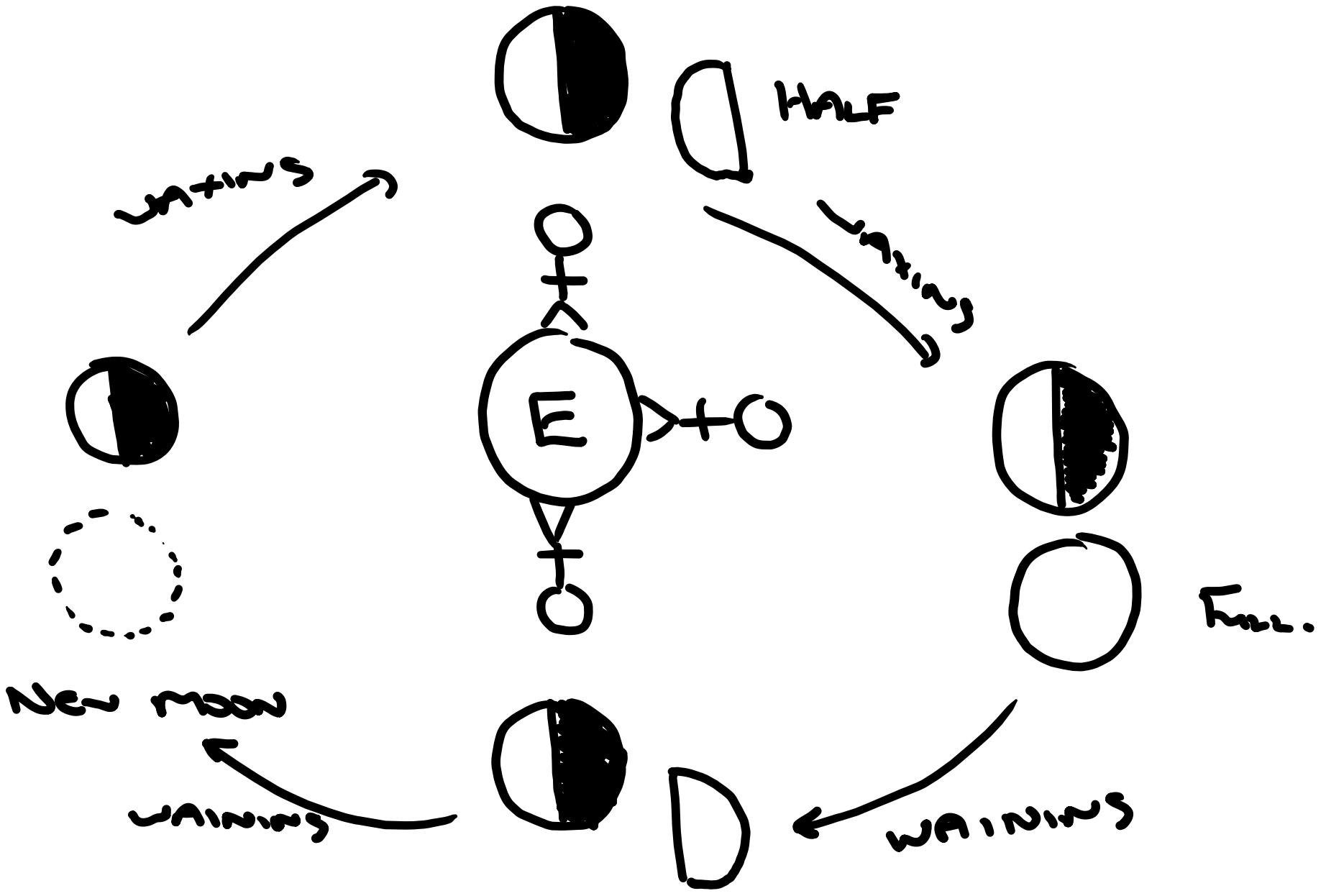
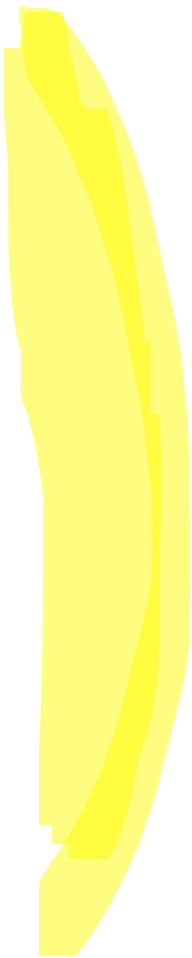


28 DAYS
14 DAYS



The phases of the Moon

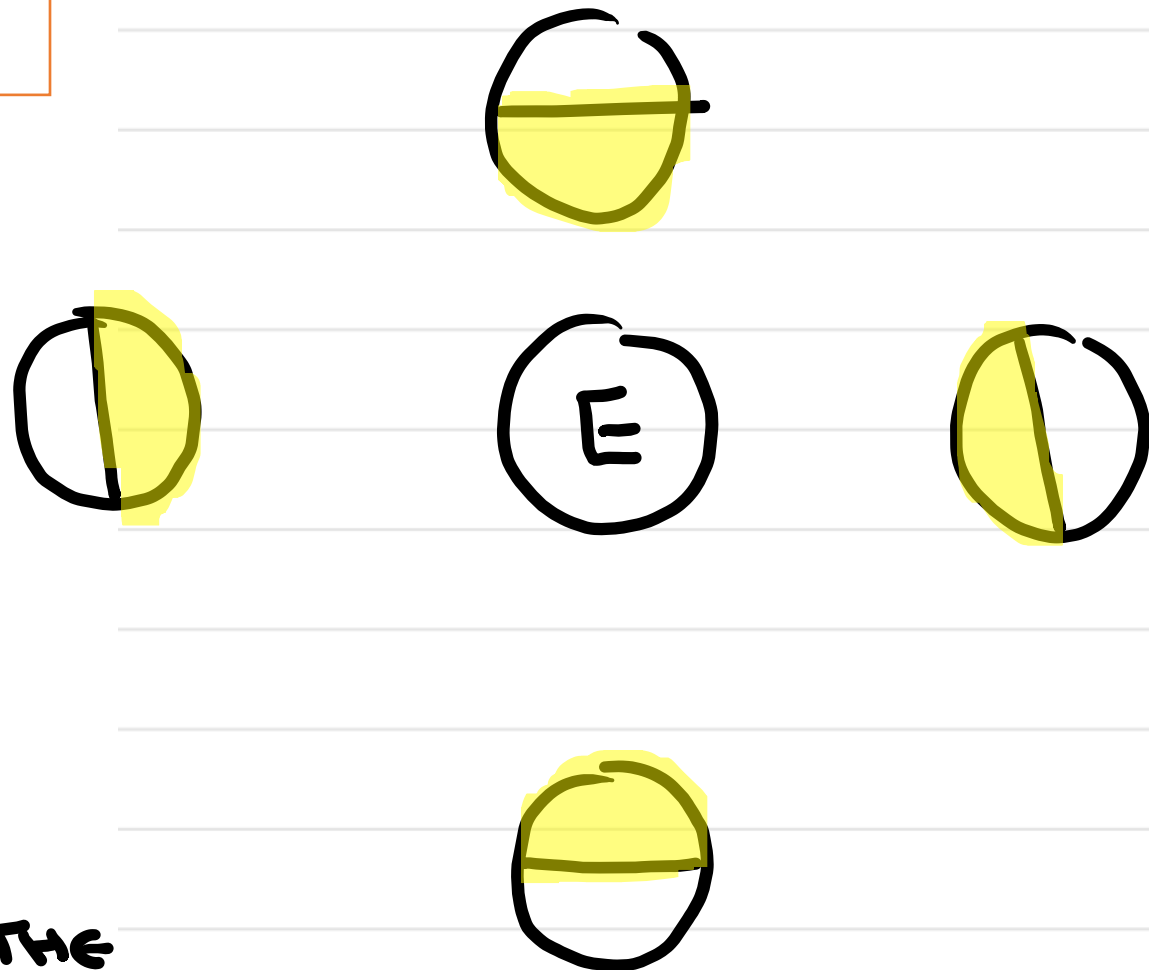




The face of the moon



THE SAME SIDE OF THE
MOON ALWAYS POINTS
AT US.



The moon's surface



LOTS OF CRATERS
CAUSED BY ASTEROIDS.

COMPOSITION THE
SAME



what is soil?



Things that live and die in the soil



worms

Put oxygen into
our soil.

Nitrogen put into
soil.

Nitrates put into
our soil

Things that live and die in the soil



Microbes break down dead plants and animals

MICROBE RELEASE
NITRATES INTO THE
SOIL.

MINERALS ☺

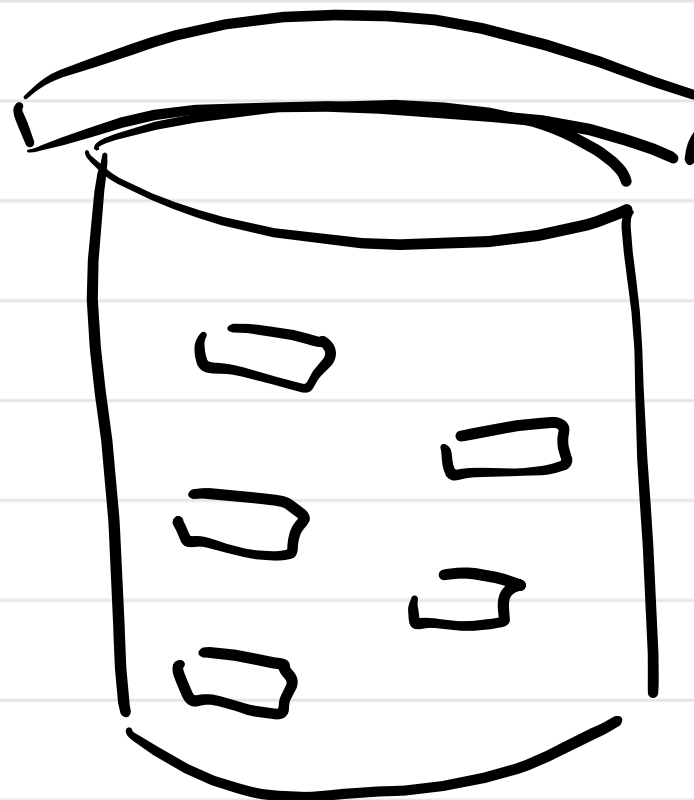
Gravelly soil



Full of small stones

Drains easily

Compost Bin

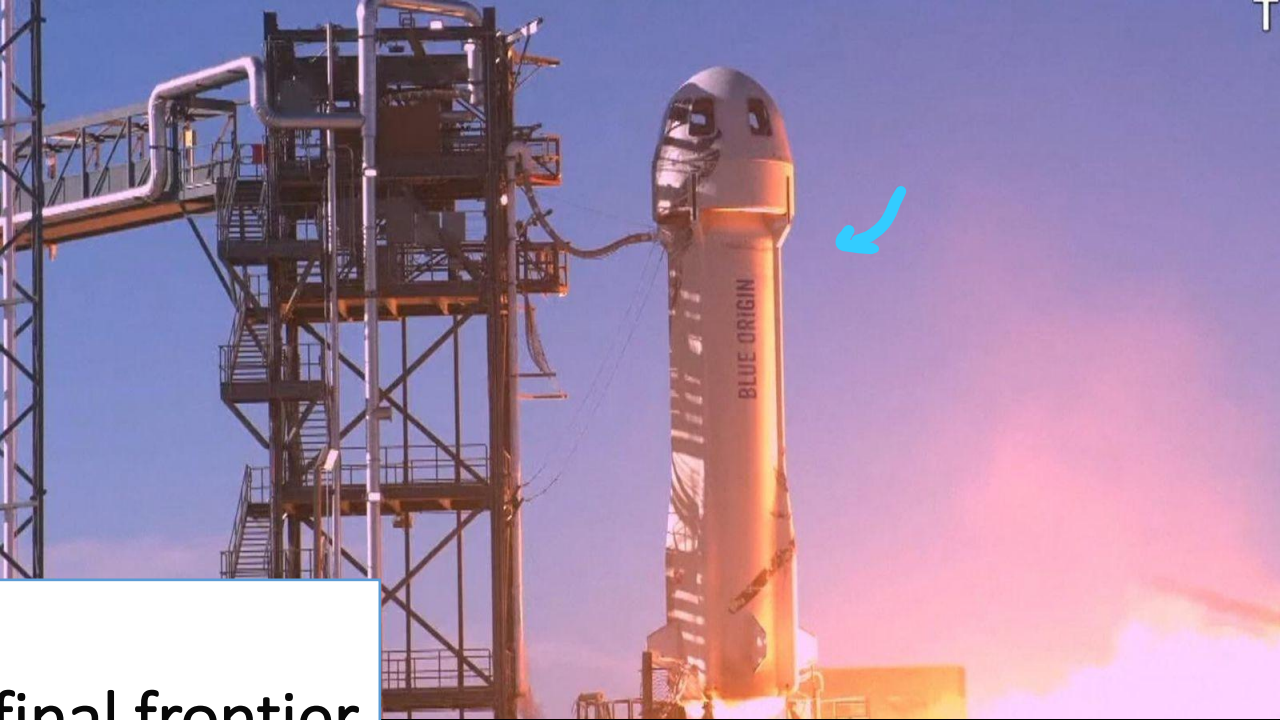


Blobs of light = PHOTON

300 000 000 metres per second

300 000 km per second

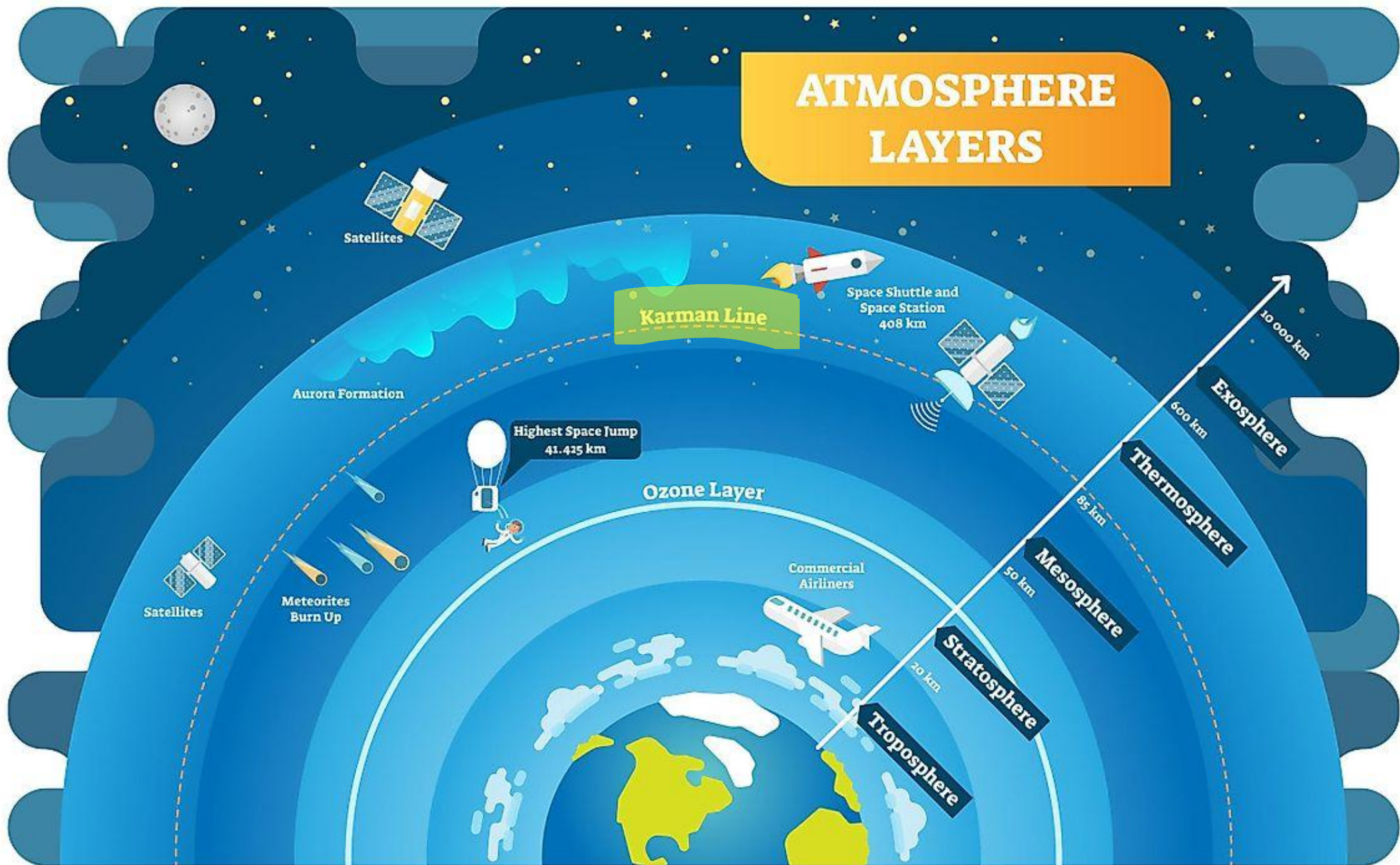
187 500 miles per second



Space...The final frontier
65 miles



ATMOSPHERE LAYERS



The solar system

The Big Bang

The 8 planets

The Sun

The inner planets

The outer planets

ALL THE PLANETS
(AND SATELLITES) THAT
ORBIT SOL.

4 500 million years

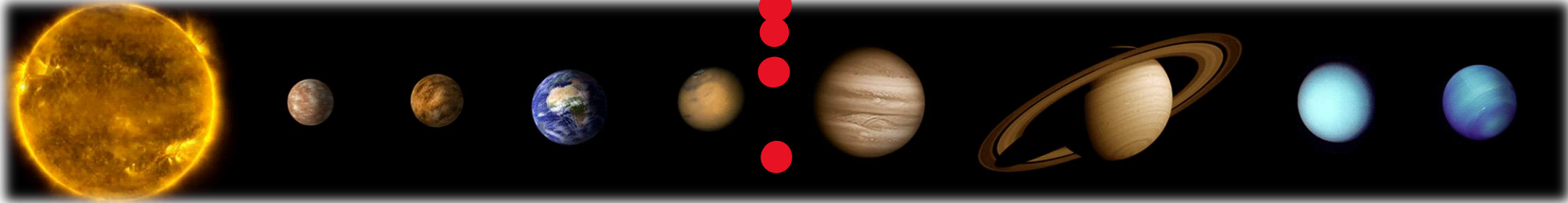
Our 8 planets



INNER PLANET	MY	-	MERCURY
	VERY	-	VENUS
	EARTH	-	EARTH (GOLDILOCK ZONE)
	METHOD	-	MARS
OUTER PLANET	JUPITER	-	JUPITER
	SATURN	-	SATURN
	URANUS	-	URANUS
	NEPTUNE	-	NEPTUNE

Our 8 planets

GAS GIANTS



LARGE ROCKS



ASTEROID
BELT



The Sun – SOL



4.5 billion years old

Surface temp: 5500 °C

Inside temp: 15 000 000 °C!!

Hydrogen
atom



Hydrogen
atom



Helium
atom

+ Energy

Nuclear
Fusion

Mercury

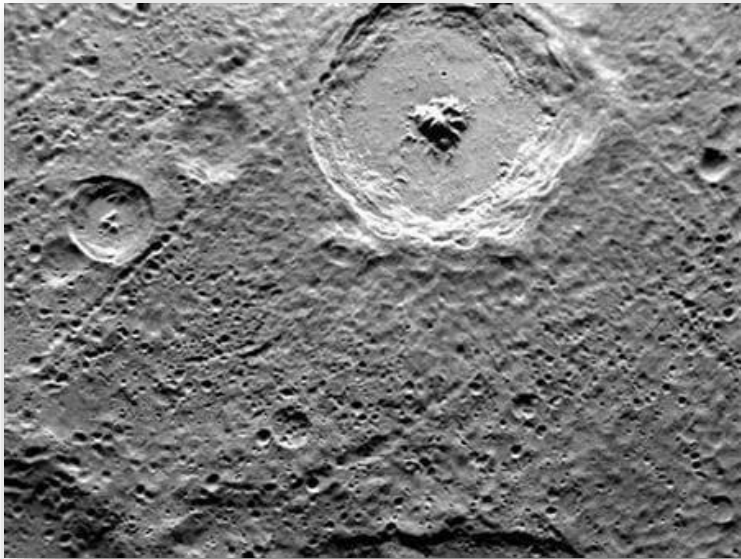


Diameter: 3000 miles

Orbital Period: 88 days

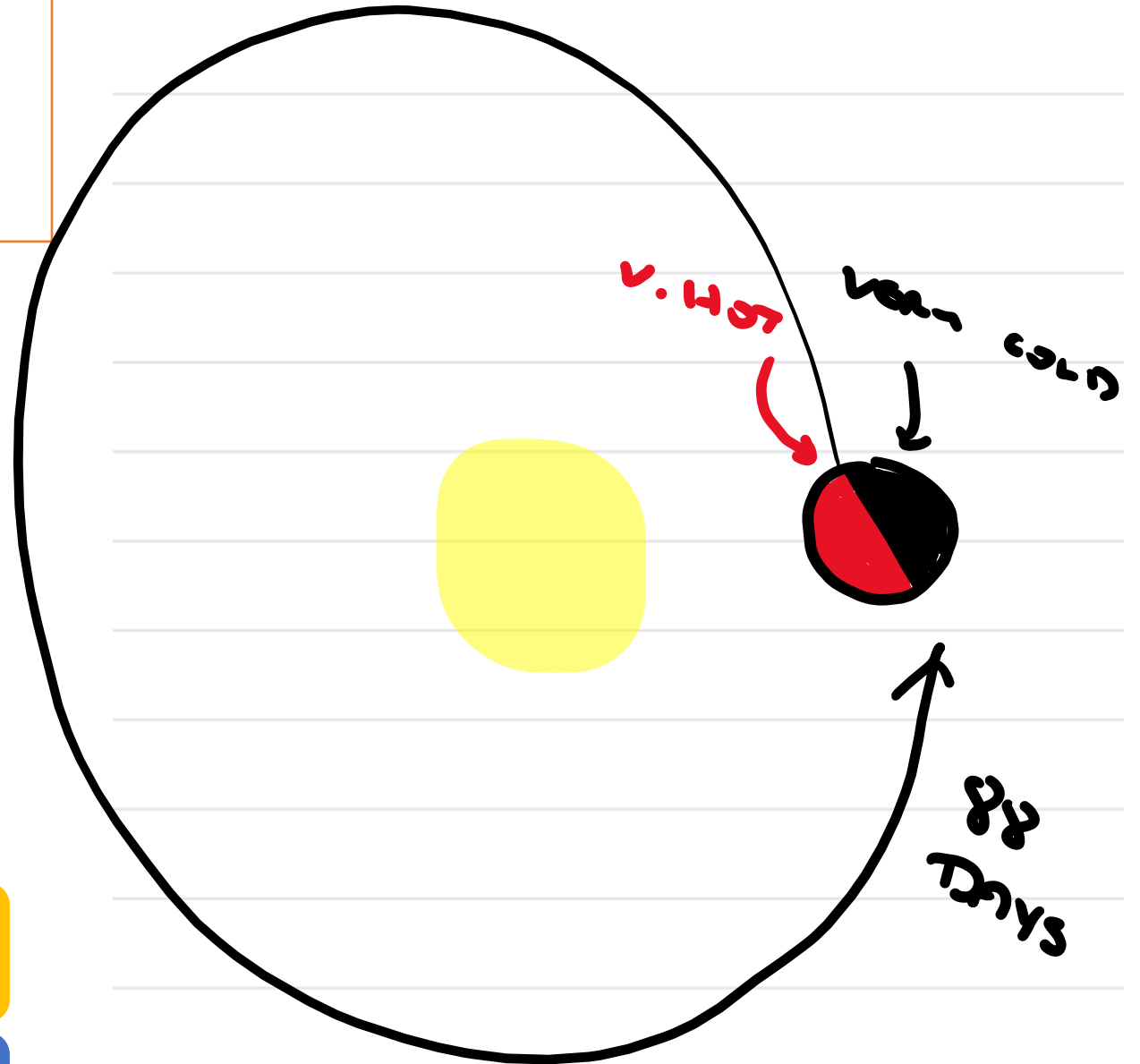
Gravity: 3.7 m/s²

Ice on Mercury



Ice has been detected on Mercury

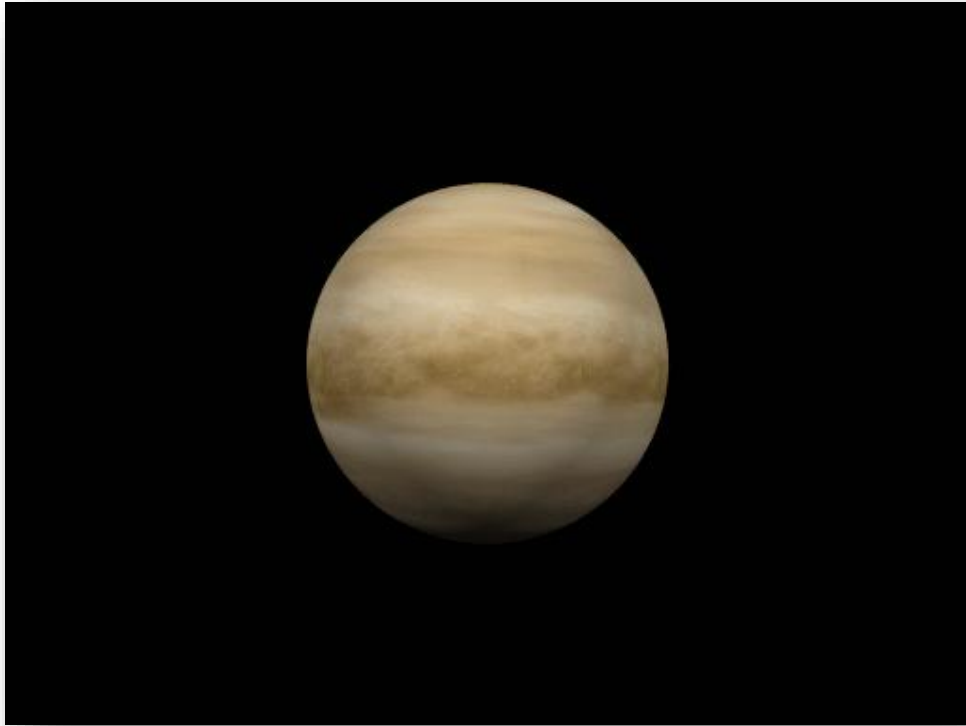
It turns on its axis once every 59 days so there is a real extreme from hot to cold



GRAVITY = ABOUT 4 m/s^2

You can jump ABOUT $2 \frac{1}{2} \times$ HIGHER
ON MERCURY.

Venus

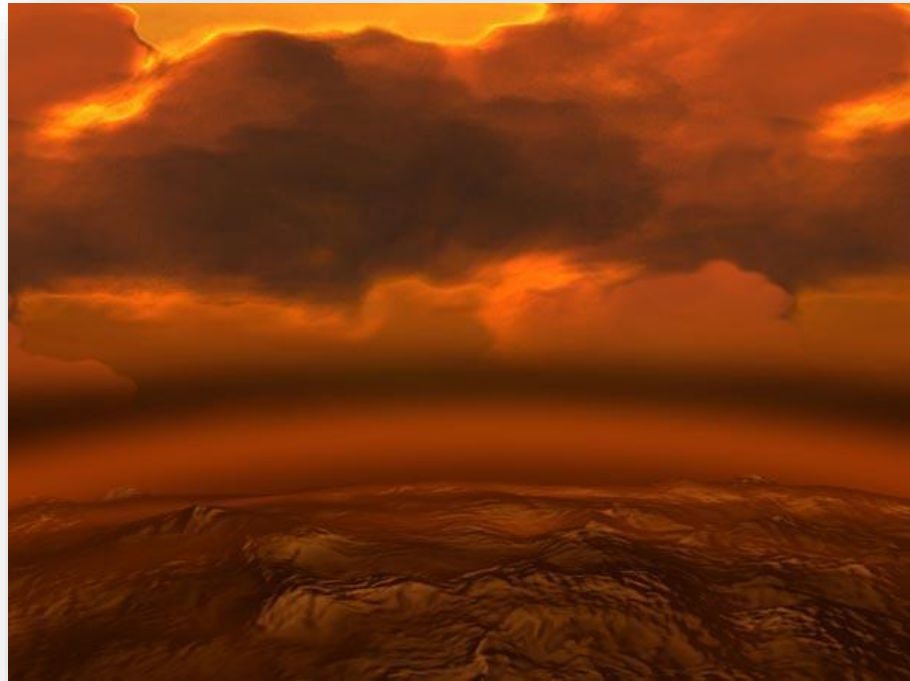


Diameter: 7500 miles

Orbital Period: 225 days

Gravity: 8.87 m/s²

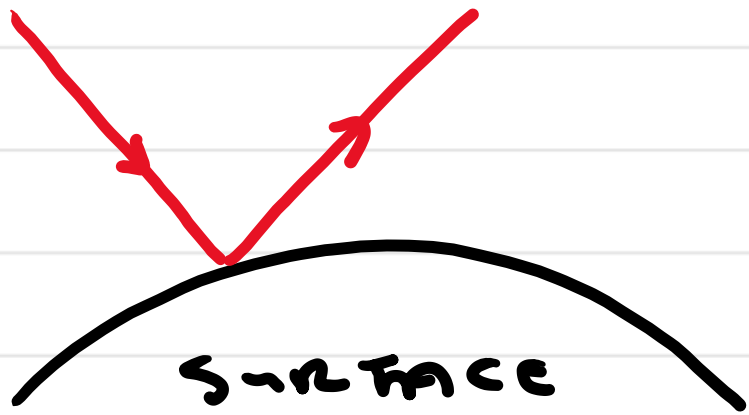
Venus atmosphere



96.5% carbon dioxide
3.5% nitrogen
Sulphur dioxide

EARTH → Nitrogen 78%
→ Oxygen 21%
→ Carbon Dioxide 0.04%

Sulphuric Acid

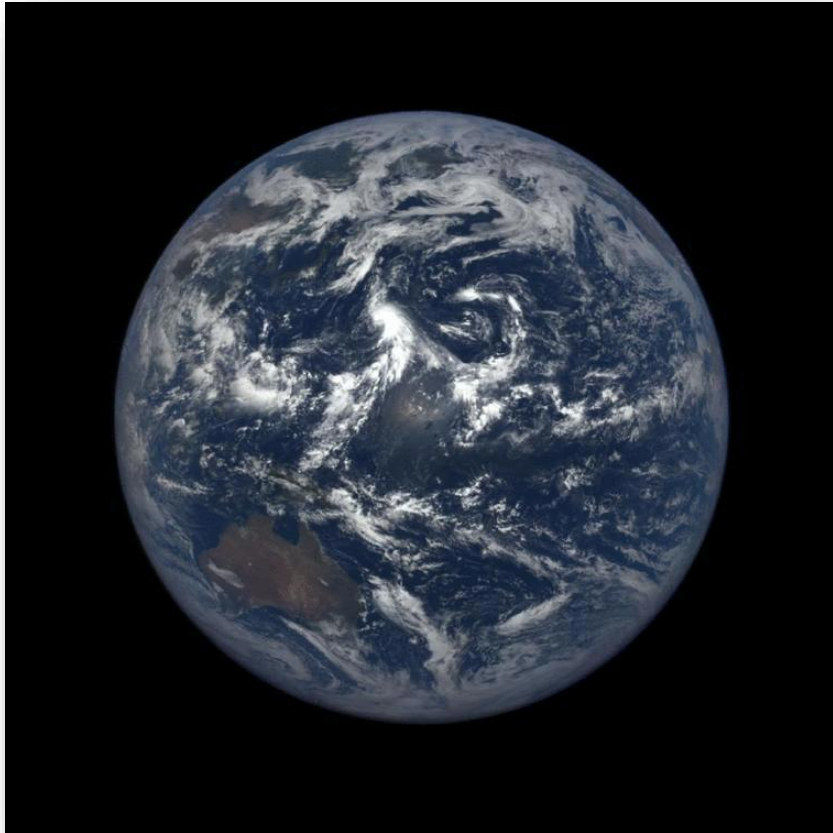


Venus on the horizon



BRIGHTEST PLANET
IN THE SOLAR SYSTEM

Earth



Diameter: 7926 miles

Orbital Period: 365.26 days

Gravity: 9.81 m/s^2

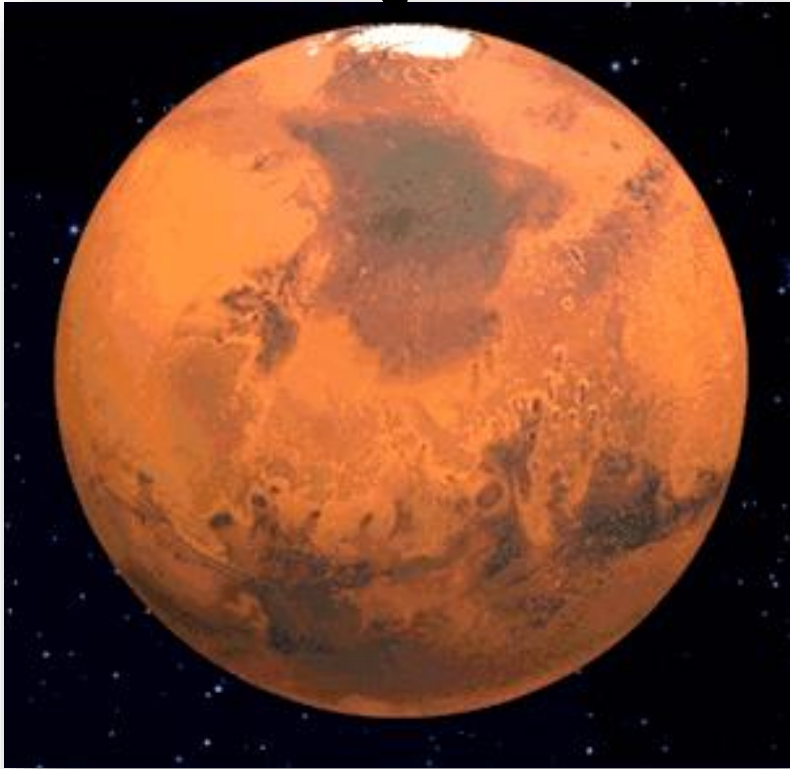
Early Earth



LOADS OF CO_2 (CARBON
DIOXIDE)

Too Hot

Mars



Diameter: 6779 miles (average)

Orbital Period: 687 days

Gravity: 3.72 m/s²

Rusty planet



When iron rusts it becomes iron oxide

The iron on Mars has also rusted

$$\text{Gravity Earth} = 9.8$$

$$\text{Mars} = 3.7$$

$$9.8 \div 3.7 = 2.6$$

This is 2.6 x higher
on Mars.

There is ice on
Mars

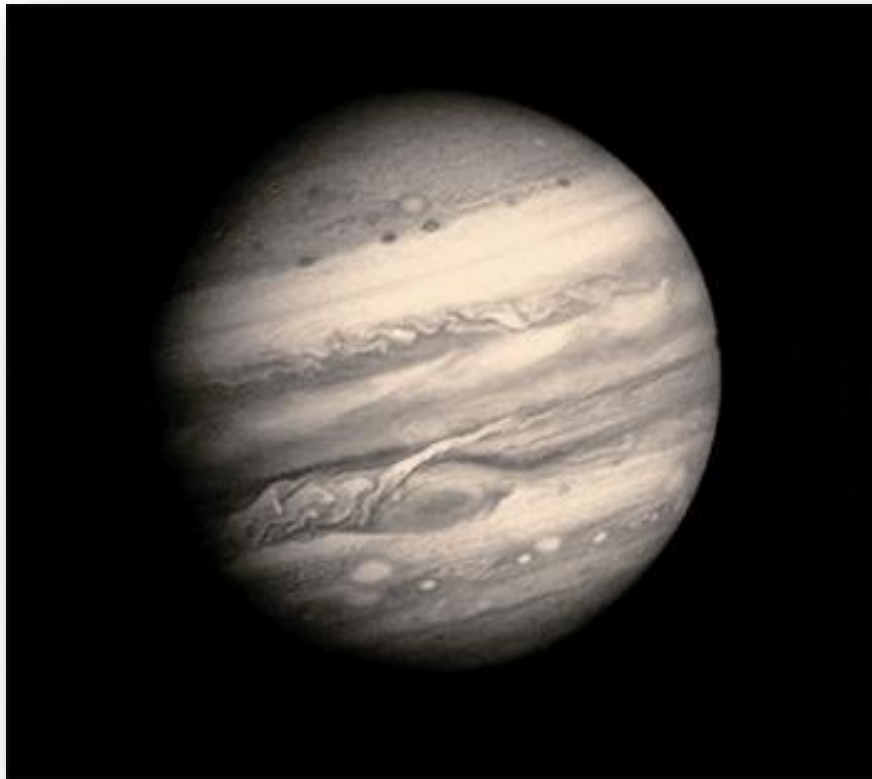
CHEMICAL

EQUATION



ONCE UPON A TIME MARS WAS
VERY SIMILAR TO EARTH.

Jupiter

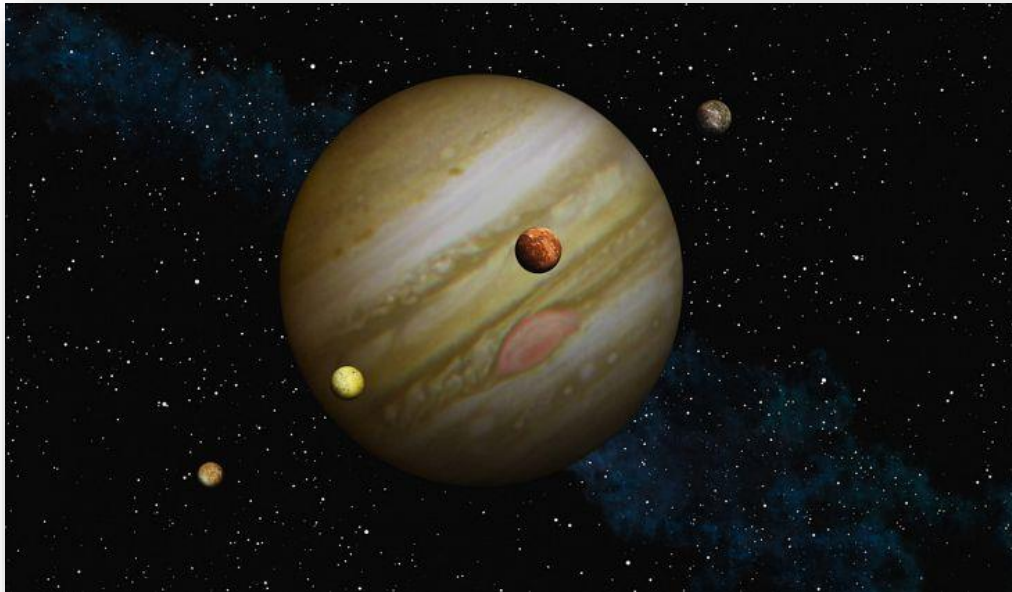


Diameter: 88 846 miles

Orbital Period: 11 years

Gravity: 24.79 m/s^2

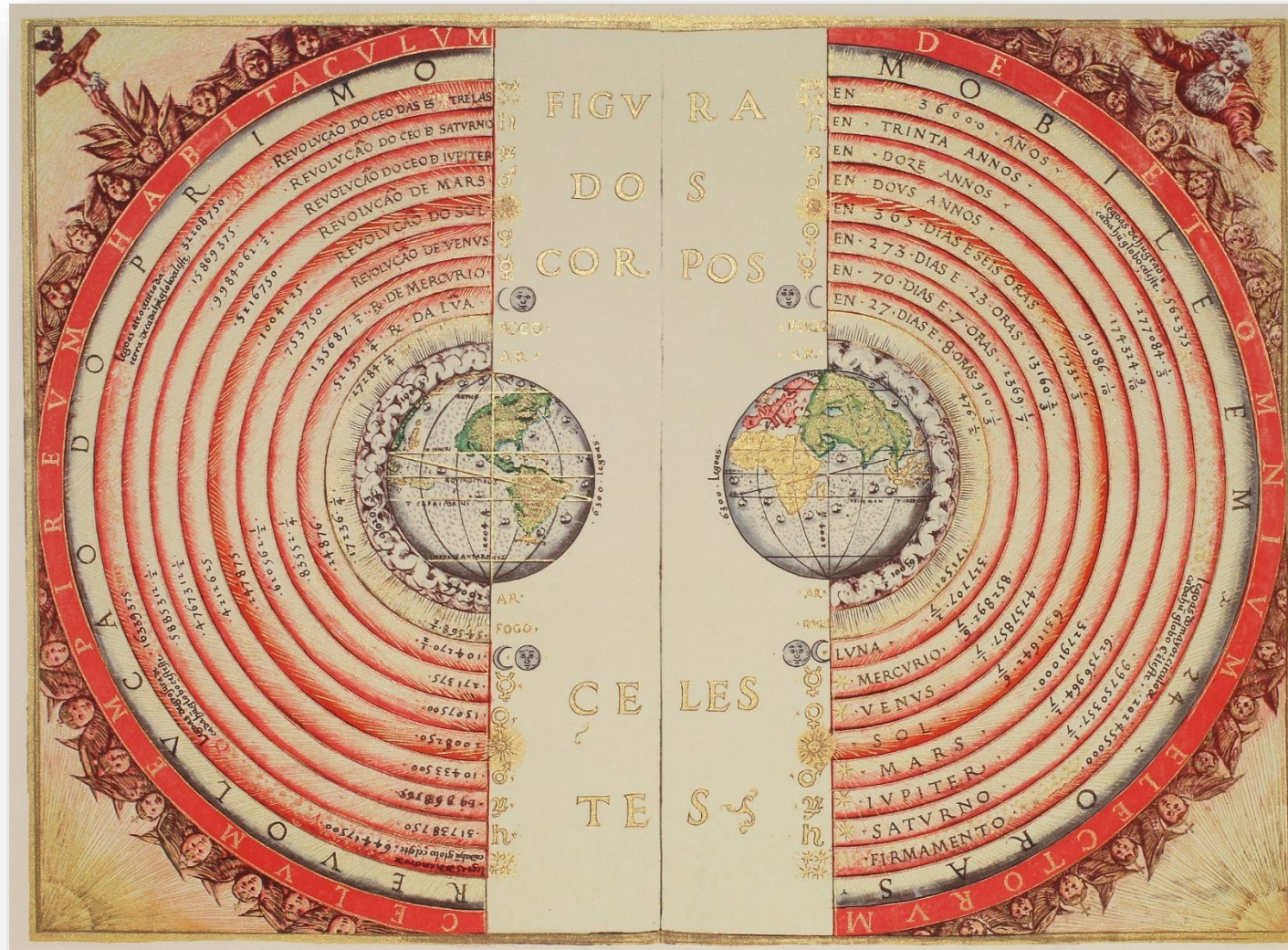
The moons of Jupiter



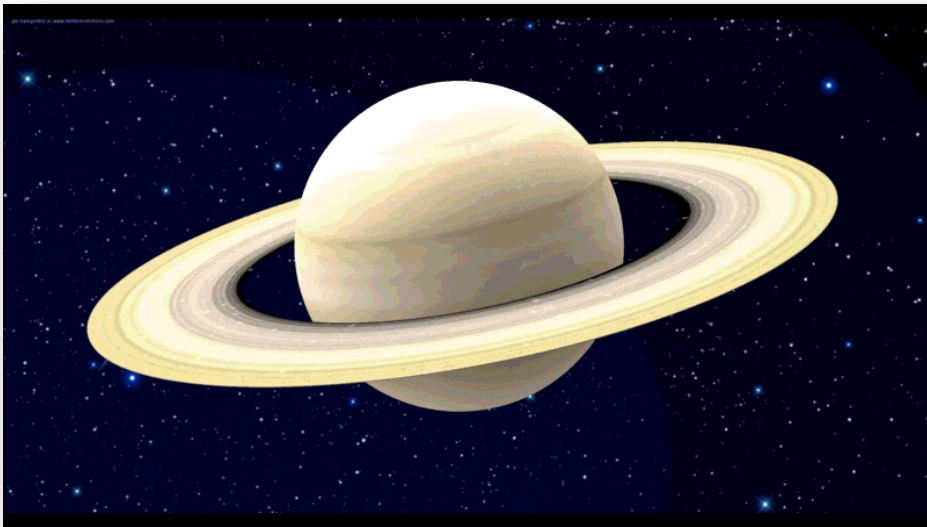
Jupiter has 79 moons!

The main ones are Io,
Europa, Ganymede and
Callisto

Geocentric model



Saturn

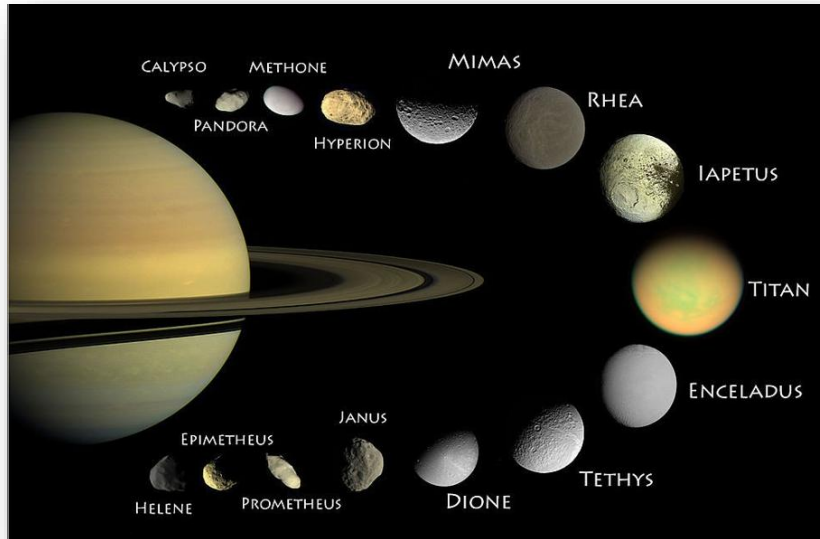


Diameter: 74 897 miles

Orbital Period: 29 years

Gravity: 10.44 m/s^2

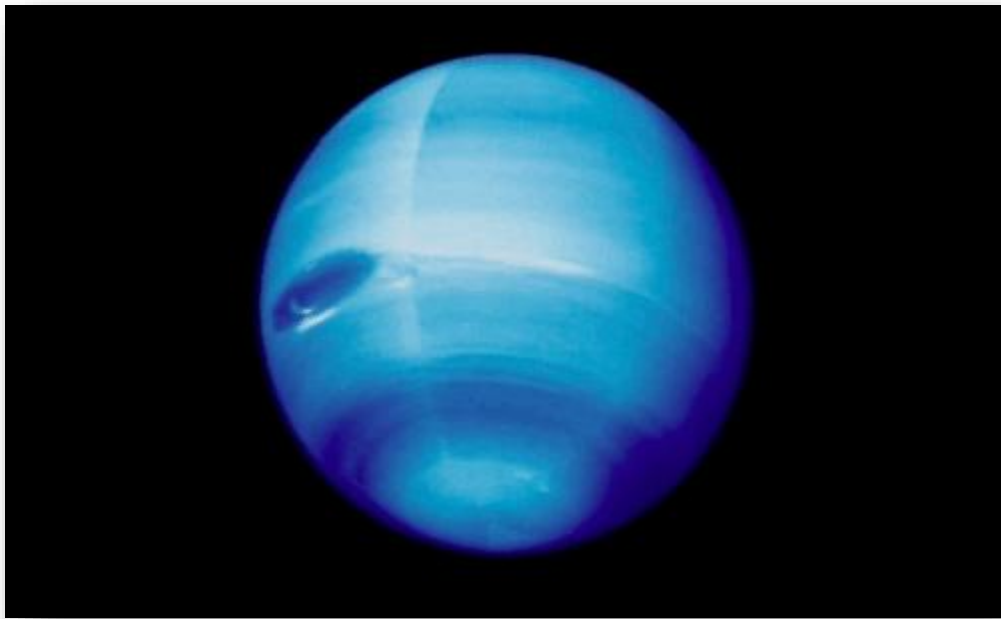
Moons of Saturn



Saturn has 82 moons

The main moons are
Titan, Enceladus and
Iapetus

Uranus



Diameter: 31 518 miles

Orbital Period: 83 years

Gravity: 8.69 m/s^2

Neptune

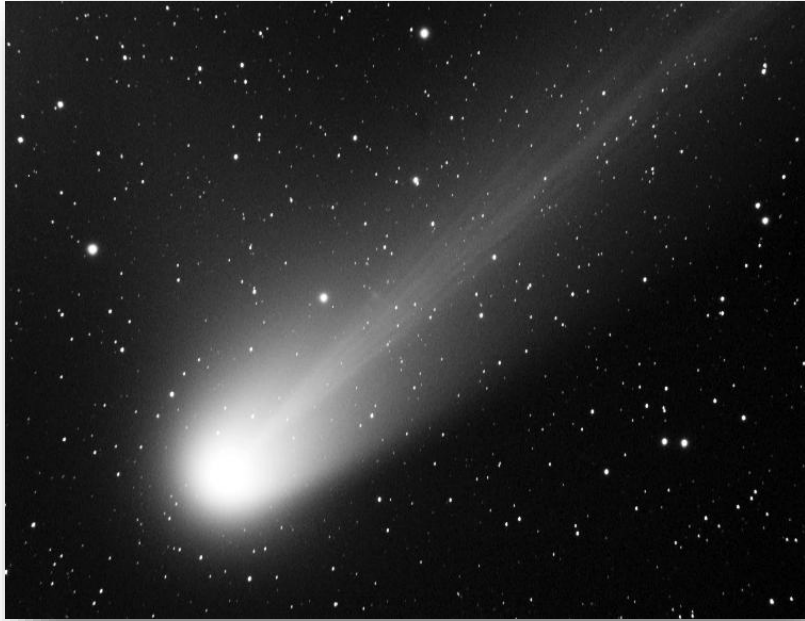


Diameter: 30 598 miles

Orbital Period: 164 years

Gravity: 11.15 m/s^2

Comets



Space Shuttle Challenger disaster

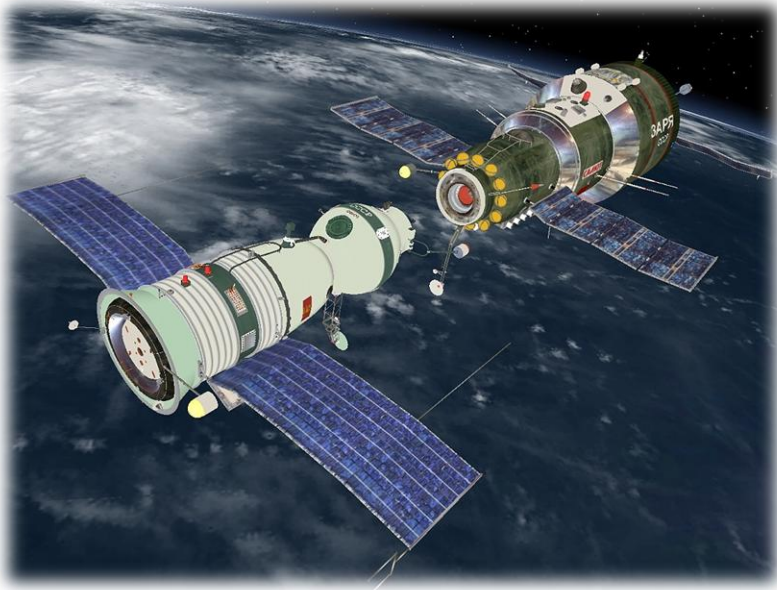


Exploded on take-off in 1986

Caused by faulty seals on the booster rockets

They knew that the seals were faulty before lift-off!!

Soyuz 11 disaster



Spacecraft depressurised in 1971

All crew died in space.

