THE DUSTON SCHOOL
Knowledge itself is power
TDS 4-19

Year 8 Science Knowledge Booklet

Term 6

Name:	**Class:**
Homework 1 Due: 14th June	**Homework 2 Due: 28th June**
Homework 3 Due: 12th July	

Science Homework 1

Read all of this knowledge organiser. And revise for your end of year assessment.

Big questions:

Where is the Earth in Space?

What is the scale of objects in the Solar System?

What is the scale of objects outside the Solar System?

What causes day and night?

What causes the seasons?

Key vocabulary

The Big Bang	The Big Bang theory is the prevailing cosmological description of the development of the universe
Circular motion	The movement of an object along the circumference of a circle or rotation along a circular path.
Galaxy	A system of millions or billions of stars, together with gas and dust, held together by gravitational attraction.
Gravity	The force that attracts a body towards the centre of any other physical body having mass.
Light year	A unit of astronomical distance equivalent to the distance that light travels in one year, which is 9.4607×10^{12} km (nearly 6 million million miles).
Moon	A natural satellite orbiting a planet.
Orbit	The curved path of a celestial object or spacecraft round a star, planet, or moon.
Planet	A celestial body that is in orbit around the Sun.
Satellite	Something orbiting the earth or another planet.
Solar system	The Solar System is the gravitationally bound system of the Sun and the objects that orbit it.
Universe	The universe is all of space and time and their contents, including planets, stars, galaxies, and all other forms of matter and energy.

Where is the Earth in Space?

The Solar System consists of the Sun, with planets and smaller objects such as asteroids and comets in orbit around it. The planets in our solar system are:

Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune

Other than the planets, what other objects are in the Solar System?

- The Sun
- The Moon
- Moons orbiting other planets (e.g. Europa, Titan)
- Dwarf planets (Pluto, Ceres)
- Asteroids
- Comets
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What is the scale of objects in the Solar System?

Jupiter and Saturn are more than 1000 times the size of Earth.
Uranus and Neptune are more than 400 times the size of Earth.
Venus is approximately the same size as Earth.
Mars is approximately 1/2 the size of Earth.
Mercury is approximately 1/3 the size of Earth.

Planet	**Distance from Sun (million km)**	**Atmosphere**	**Weather**	**Mean Temperature (°C)**
Mercury	58	Very thin	Moon-like, no weather	167
Venus	108	Very thick	Extreme global warming	464
Earth	150	Thick	Temporal/good balance	15
Mars	228	Very thin	Dust storms	-20
Jupiter	779	Very thick	Stormy	-110
Saturn	1434	Very thick	Stormy	-167
Uranus	2873	Thick	Extremely cold	-195
Neptune	4495	Thick	Cold, dark, windy	-200

Science Homework 2

Try to answer all of these key knowledge questions. Then check your answers using the last page. These are some of the questions that will be in the knowledge quizzes and the end of term tests.

Key knowledge question	
Earth is in which galaxy?	
Put these in size order, largest first - galaxy, planet, star, universe	
Roughly how far away is the Sun?	
What equation links mass, gravity and weight?	
What is a light year?	
What is the unit of gravitational field strength?	
What is the unit of mass	
What is the unit of weight?	
Which force keeps the planets in orbit?	
Which planets are called the inner rocky planets?	

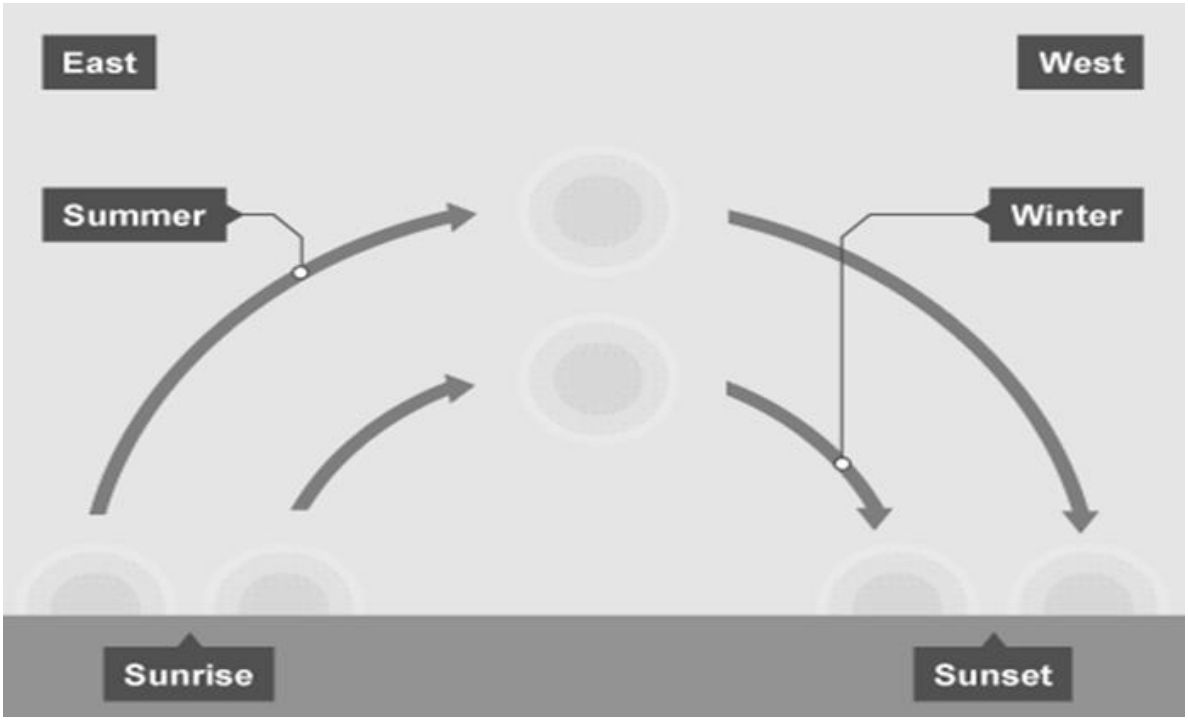
What is the scale of objects outside the Solar System?

Light years

- The distances between objects in space are huge:
- The distance from one star to another in a galaxy is millions of times more than the distance between the planets in the solar system.
- The distance from one galaxy to another is millions of times more than the distance between the stars in a galaxy.
- This means that the numbers used to describe distances in space become very difficult to understand and to write down.
- To get around this problem, scientists use the light year as the unit of astronomical distance. It is the distance travelled by light in one year.

What causes day and night?

- The half of the Earth facing the Sun is in daylight.
- During the day, the Sun appears to move through the sky.
- Remember that this happens because the Earth is spinning on its axis.
- The half facing away from the Sun has no sunlight and so becomes night-time.

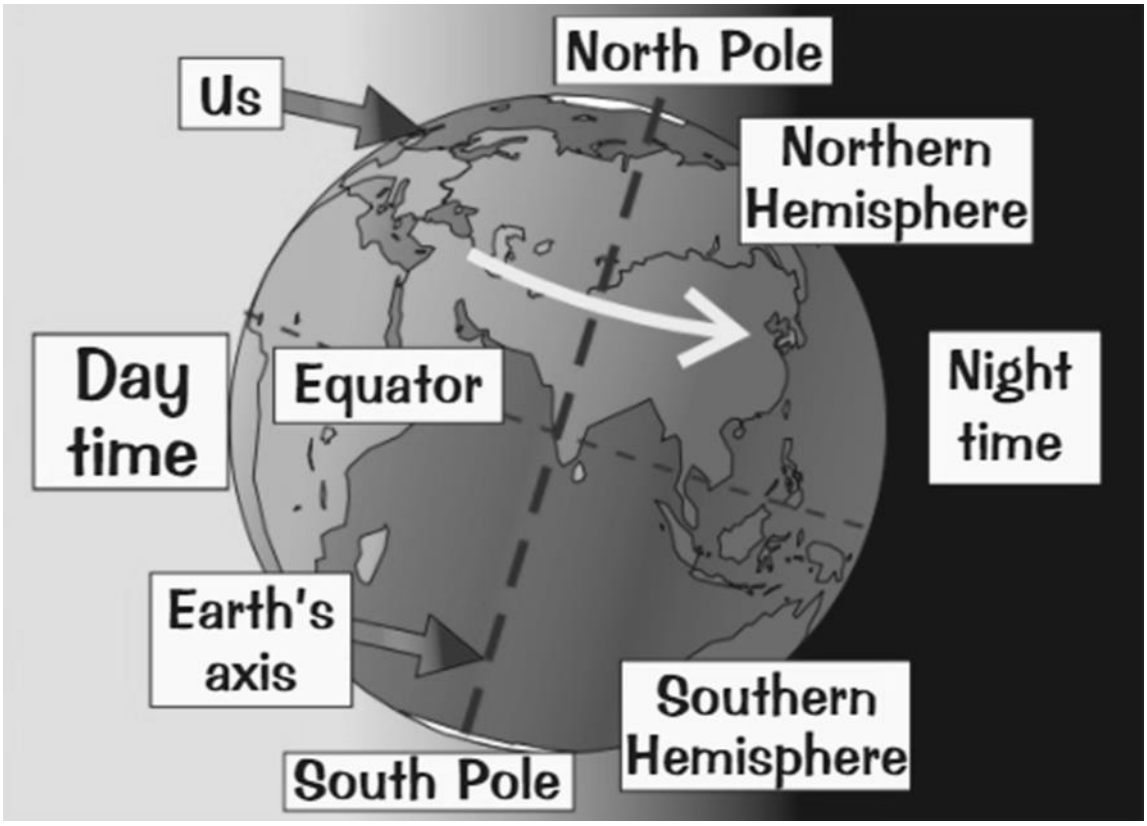


What causes the seasons?

What is a year?

- A planet's year is the time it takes to make one complete orbit around the Sun.
- The Earth goes once round the Sun in one Earth year, which takes 365 Earth days*.

* Its actually 365¼ days. The extra ¼ day is sorted out every leap year.



Due to Earth’s tilted axis, we get different seasons (winter, spring, summer and autumn).

Summer

When it is summer in the UK, the northern hemisphere is tilted towards the Sun

The northern hemisphere spends more time in sunlight than it does in darkness (longer days), so the surface heats up.

The Sun’s rays cover a smaller area of land, so energy transferred is focused on that area.

Winter

When it is winter in the UK, the northern hemisphere is tilted away from the Sun

The northern hemisphere spends less time in sunlight than it does in darkness (shorter days)

The Sun’s rays cover a larger area of land, so energy transferred is spread out over that area.

Science Homework 3

Try to answer all of these key knowledge questions. Then check your answers using the last page. These are some of the questions that will be in the knowledge quizzes and the end of term tests.

Key knowledge question	Your answer
State the balanced symbol equation for photosynthesis.	
State the role of stomata in photosynthesis and respiration.	
State the word equation for anaerobic respiration in animals.	
State the word equation for anaerobic respiration in plants.	
State the balanced symbol equation for photosynthesis.	
Give an example of variation in humans caused only by genes.	
Give an example of variation in humans that is continuous.	
What do we call the smallest particle of a chemical element that can exist?	
What is an element?	
What is the mass of a proton?	
What is the mass of an electron?	
What is meant by oxidation?	
What is the name of group 1 metals?	

Key knowledge question	Answer
Earth is in which galaxy?	The Milky Way
Put these in size order, largest first - galaxy, planet, star, universe	Universe, galaxy, star, planet
Roughly how far away is the Sun?	150 million kilometres
What equation links mass, gravity and weight?	Weight = mass x gravitational field strength
What is a light year?	A measure of distance, it is the distance travelled by light in one year.
What is the unit of gravitational field strength?	Newtons per kilogram (N/kg)
What is the unit of mass	Kilograms (kg)
What is the unit of weight?	Newtons (N)
Which force keeps the planets in orbit?	Gravity
Which planets are called the inner rocky planets?	Mercury, Venus, Earth and Mars
State the balanced symbol equation for photosynthesis.	$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$
State the role of stomata in photosynthesis and respiration.	Gas exchange
State the word equation for anaerobic respiration in animals.	glucose → Lactic acid + Energy
State the word equation for anaerobic respiration in plants.	glucose → carbon dioxide and ethanol
State the balanced symbol equation for photosynthesis.	$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$
Give an example of variation in humans caused only by genes.	Blood group, eye colour, genetic gender, tongue rolling
Give an example of variation in humans that is continuous.	Height, weight anything that can be measured on a scale
What do we call the smallest particle of a chemical element that can exist?	An atom
What is an element?	A substance made of only one type of atom
What is the mass of a proton?	1
What is the mass of an electron?	Negligible/1/1836
What is meant by oxidation?	Forming a bond with oxygen
What is the name of group 1 metals?	Alkali metals