Your notes

KS3 Science: revision notes

P1.2 Space

Contents

1. Gravity, mass and weight
2. The Solar System and beyond
3. Orbits and satellites
4. Days, years, seasons and eclipses
5. Key terms
6. Quick questions
7. What to do next

Gravity, mass and weight

- **Gravity** is a non-contact force that pulls **masses** towards each other. Bigger **masses** have stronger gravity, and gravity gets weaker further away.
- **Mass** is the amount of matter in an object, measured in kilograms (kg). It is the same everywhere.
- **Weight** is the force of **gravity** on an object, measured in newtons (N): **weight** = mass × gravitational field strength.
- On Earth, the **gravitational field strength** is about 10 N/kg; on the Moon it is 1.6 N/kg. A 50 kg person weighs 500 N on Earth but only 80 N on the Moon.

The Solar System and beyond

- The Sun is a **star** at the centre of our Solar System. Eight **planets orbit** it: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. The inner four are rocky; the outer four are gas and ice giants.
- Dwarf **planets** (such as Pluto), asteroids and comets also **orbit** the Sun. Moons **orbit** planets.
- The Sun is one of billions of **stars** in the Milky Way **galaxy**, and there are billions of galaxies in the universe.
- A **light year** is the distance light travels in one year. It is used to measure the huge distances to **stars**.

Orbits and satellites

- **Gravity** keeps the **planets** in **orbit** around the Sun and the Moon in orbit around the Earth.
- A **satellite** is an object that **orbits** a **planet**. The Moon is a natural satellite. Artificial satellites are used for communication, satellite navigation (GPS), weather forecasting and observing the Earth.

Days, years, seasons and eclipses

- A day is the time for the Earth to spin once on its **axis** (24 hours). A year is the time for the Earth to **orbit** the Sun (about 365¼ days).
- Seasons are caused by the tilt of the Earth's **axis**. In the UK summer, the northern hemisphere is tilted towards the Sun, so days are longer and the Sun is higher in the sky, making its rays more concentrated. They are not caused by the Earth being closer to the Sun.
- The Moon doesn't give out light; we see it because it reflects sunlight.
- In a **solar eclipse**, the Moon passes between the Sun and the Earth, and its shadow falls on the Earth. In a **lunar eclipse**, the Earth is between the Sun and the Moon, and the Earth's shadow falls on the Moon.

Key terms

Gravity	A force of attraction between masses.
Mass	The amount of matter in an object, measured in kilograms.
Weight	The force of gravity on an object, measured in newtons.
Gravitational field strength	The force of gravity on each kilogram, in N/kg.
Orbit	The path of an object around a star, planet or moon.
Satellite	An object that orbits a planet.
Star	A huge ball of gas that gives out light, such as the Sun.
Planet	A large object that orbits a star.
Galaxy	A huge group of billions of stars.
Light year	The distance light travels in one year.
Axis	The imaginary line the Earth spins around.
Solar eclipse	When the Moon blocks the Sun's light from reaching part of the Earth.
Lunar eclipse	When the Earth's shadow falls on the Moon.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What is the unit of weight?
2. An astronaut has a mass of 70 kg on Earth. What is their mass on the Moon?
3. A 50 kg student stands on Earth, where g = 10 N/kg. What is their weight?
4. Why do you weigh less on the Moon?
5. Which planet is closest to the Sun?
6. What causes day and night?

Your notes

7. How long does it take the Earth to orbit the Sun?
8. What causes the seasons?

Answers

1. Newtons (N)
2. 70 kg
3. 500 N
4. The Moon's gravity is weaker
5. Mercury
6. The Earth spinning on its axis
7. About 365 days (one year)
8. The tilt of the Earth's axis

What to do next

Practise 14 questions on this topic

Try 4 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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