

Do try this at home...



Check out some great physics experiments to try at home with Marvin and Milo on the Institute of Physics website – there's a new experiment each month!

www.physics.org/marvinandmilo.asp

Want to know more?



Forces

Watch scientist Brian Cox recreate Galileo's falling objects experiment in a zero gravity container at NASA.

www.youtube.com/watch?v=E43-CfukEgs

Earth & Space

Space scientist Maggie Aderin-Pocock explains how she overcame barriers to follow the career of her dreams.

www.bbc.com/teach/class-clips-video/careers-as-a-space-scientist-maggie-aderinpocock/zvwxnrd

Light

Check out the great class clips at BBC Bitesize.

www.bbc.com/bitesize/clips/zg6r82p

Electricity

Explain That Stuff is a great science website that covers lots of different topics and has some fantastic pages about electricity with images and things to try at home.

www.explainthatstuff.com/electricity.html

Careers



These are some of the careers where Physics is central to the role.

You can find out some information about these cool careers and maybe find some new ones that we haven't included.

Happy researching!

Sound engineer

Satellite engineer

Geophysicist/
Seismologist

Surgeon

Metallurgist

Sound engineer

Nanotechnologist

TV/radio/film
producer

Radiation protection
practitioner

TV science advisor

Research scientist

Climate researcher

CAD technician

Ice scientist

Investment analyst

Solar energy engineer

Machine learning
engineer

Renewable energy
manager

Meteorologist

Architect

Nuclear engineer

Structural engineer

Operational
researcher

Tunnel engineer

Patent lawyer

Mechanical engineer

Software engineer

Aerospace engineer

Computer games
designer

Science journalist

Astrophysicist

UoN

University of
Northampton

KS2 Physics



This science learning resource was developed in conjunction with colleagues at Windmill Primary School.

Forces



Unsupported objects fall towards the Earth because of the force of **gravity** acting between the Earth and the falling object.

Forces are measured in **Newtons**.

Forces can make things start to move, speed up, slow down, change direction or stop.

Friction is a force between two surfaces that are sliding or trying to slide across each other.

Air resistance is a type of friction between air and another material.

Water resistance is a type of friction between water and another material.

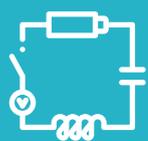
Mass is the actual amount of matter in an object.

Weight is the force that gravity applies to an object.

An object will have the same **mass** on Earth and on the moon but a different **weight** because of the difference in **gravity**.

Some mechanisms, including levers, pulleys and gears, allow a smaller **force** to have a greater effect. For example, it's easier to lift an object using a pulley.

Electricity



Electricity is the flow of electrical charge.

An **electrical circuit** is a complete path around which electricity can flow. A **series circuit** is where the current follows one path.

A **cell** pushes the **electrical current** and has a positive and a negative end. Two or more **cells** can be connected to make a **battery**.

The brightness of a lamp or the volume of a buzzer are affected by the number and **voltage** of cells used in the **circuit**.

Standard **symbols** are used when representing a simple **circuit** in a **diagram**.

In the UK **mains electricity** is 230V.

Earth & Space



The **Sun** is a **star** at the centre of our **solar system**.

Our **solar system** has eight planets: **Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus** and **Neptune**. (Pluto is no longer classed as a planet; it was reclassified as a 'dwarf planet' in 2006).

The **Earth** spins on an imaginary **axis** at 1000 miles per hour. It takes 24 hours to complete a full rotation. At the same time, the Earth is in orbit around the sun and it takes one year to complete one full **orbit**.

It is daytime on the side of the Earth that faces the Sun and night time on the side that is facing away.

The geocentric model of the universe had the Earth at the centre and this was a popular theory until the 1600s. Work by **Galileo, Nicolaus Copernicus** and **Johannes Kepler** helped to replace this theory with the more accurate **heliocentric model** where the Sun is at the centre.

The Moon is the Earth's only natural satellite but Jupiter has four large moons and numerous smaller ones.

Earth's moon takes just over 27 days to orbit the Earth. The Moon is not a light source but can be seen at night because it reflects light from the Sun.

Different amounts of the Moon are visible on earth through a month due to the changing alignment of the Moon, Earth and Sun.

Light



Light appears to travel in straight lines. Light travels at 299,792,458 metres per second.

When light travels from air through water, glass or anything that lets light through, it gets bent. This bending is called **refraction**.

We can see objects because they either give out or **reflect** light into the eye.

Shadows are caused by objects blocking the light.

Shadows have the same shape as the objects that cast them but can change in proportion and size depending on the angle of and distance from the light to the object.

Super Scientists



Sir Isaac Newton



was an English mathematician and physicist who lived from 1642-1727.

In 1687 Newton published **Principia** which outlined his 3 laws of motion and his law of gravitation.

(Tim Peake's mission to the International Space Station was called Principia.)

Caroline Herschel



was born in 1750 and was an amazing astronomer.

She discovered new star clusters and was the first woman to discover a comet – she discovered eight in total.

She was also the first woman to be paid for her science work when her brother William, who had

been named the king's personal astronomer after his discovery of Uranus in 1781, persuaded his patron to reward his assistant with an annual salary.

Dr Maggie Aderin Pocock



is a space scientist and a presenter on the TV show 'The Sky at Night.'

She worked on the 8m Gemini Telescope in Chile and the James Webb Space Telescope which will be launched into space in 2021