Year Group: 5 **Term: Autumn**	**Unit Title: To Infinity and Beyond**
Enquiry: Can you apply your knowledge of physics to create an electrical quiz games? (Pupils will create a quiz about planets within our solar system which uses electrical circuits to activate a buzzer/light when correct)	Driver Subject/s: Science

<u>Light</u>

How does **light** travel?

- Light travels in a straight line.
- When you place a **torch** on a table in a **dark** room, the beam travels in a straight line.
- **Reflection** is when **light** bounces off a sur-face - this changes the direction in which the light travels.

What is the relationship between light sources and shadows?

- Because **light** travels in straight lines, when there is an **opaque** object blocking the light, a **shadow** is formed.
- These **shadows** have the same shape as the objects that cast them.
- The size of a shadow changes as the light **source** moves.
- The meaning of **opaque**, **transparent** and **translucent**.

How do we see?

- Light travels in a straight line and hits an object. The ray of light is **reflected** off of the object and travels in a straight line to the eye allowing it to see the object.

<u>Space</u>

What causes day and night?

- The Earth **rotates** on its **axis** anti-clockwise and makes a complete rotation over 24 hours (a day).
- This makes it appear as the Sun moves through the sky but the Earth's rotation causes day and night.
- Different parts of the Earth experience daylight at different times - this means that it is morning, afternoon and night in different places. This is also the reason why we have **time zones**.
- Because of the Earth's tilt, the poles experience 24 hours of sunlight in the summer, and very few hours of sunlight in the winter.
- As the Earth rotates, **shadows** that are formed change in size and orientation.

Year length and the seasons

- The Earth takes 365 and a quarter days to **orbit** the Sun.
- Because of the extra quarter day it takes to orbit the Sun, every four years on Earth is a **leap year**.
- It is the Earth's tilt that causes the seasons.

The Moon

- The Moon is a **sphere**. It **orbits** the Earth anticlockwise and takes approximately 28 days.
- The Moon spins once on its **axis** every time it orbits Earth. This means that we only see one side of the Moon.
- The Moon has different phases depending on where it is in its **orbit**.
- When the Moon passes between the Sun and Earth, the **shadow** cast by the Moon falls on the Earth's surface and we would no longer be able to see the Sun. This is called a **solar eclipse**.

What is the Solar System?

- There are 8 **planets** in our **Solar System** (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune). Pluto is a dwarf planet.
- They all **orbit** the Sun, which is a **star**, and they all have moons.
- The first four **planets** are relatively small and rocky, while the four outer planets are gas giants (Jupiter and Saturn) or ice giants (Uranus and Neptune).
- There are also **asteroids**, **meteoroids** and **comets** in the Solar System.
- The **Solar System** is in a **galaxy** called the Milky Way.

<u>Electricity</u>

- Match **circuit** symbols to their **components**.
- Compare and give reasons for variations in how **components** function, including the brightness of **bulbs**, the loudness of **buzzers** and the on/off position of **switches**.
- Associate the brightness of a lamp or the volume of a **buzzer** with the number and **voltage** (the force of the **current**) of **cells** used in the **circuit** by observing and explaining the effect of different **volts** in a circuit.

Key Vocabulary: Light and Electricity

angle - the direction from which you look at something
electricity - a form of energy that can be carried by wires and is used for heating and lighting, and to provide power for machines
emits - to emit a sound or light means to produce it
mirror - a flat piece of glass which reflects light, so that when you look at it you can see yourself reflected in it
opaque - if an object or substance is opaque, you cannot see through it
reflects - sent back from the surface and not pass through it
shadows - a dark shape on a surface that is made when something stands between a light and the surface
source - where something comes from
translucent - if a material is translucent, some light can pass through it
transparent - if an object or substance is transparent, you can see through it

appliances - a device or machine in your home that you use to do a job such as cleaning or cooking. Appliances are often electrical.
battery - small devices that provide the power for electrical items such as torches
bulb - the glass part of an electric lamp, which gives out light when electricity passes through it.
buzzer - an electrical device that is used to make a buzzing sound
cell - a synonym for battery
circuit - a complete route which an electric current can flow around
component - the parts that something is made of
current - a flow of electricity through a wire or circuit
device - an object that has been invented for a particular purpose
energy - the power from sources such as electricity that makes machines work or provides heat
mains - where the supply of water, electricity, or gas enters a building
motor - a device that uses electricity or fuel to produce movement
power - power is energy, especially electricity, that is obtained in large quantities from a fuel source and used to operate lights, heating, and machinery.
switch - a small control for an electrical device which you use to turn the device on or off
voltage - the force of an electric current as measured in volts

Key Vocabulary: Space

axis - an imaginary line through the middle of something
comet - a bright object with a long tail that travels around the Sun
galaxy - an extremely large group of stars and planets. Our galaxy is called the Milky Way.
gravity - the force which causes things to drop to the ground
leap year - a year which has 366 days. The extra day is the 29th February. There is a leap year every four years
meteorite - a rock from outer space that has landed on Earth
orbit - the curved path in space that is followed by an object going round and round a planet, moon, or star
planet - a large, round object in space that moves around a star
rotate – to spin on an axis
shadow - a dark shape on a surface that is made when something stands between a light and the surface
solar eclipse – where the position of the moon prevents the sun being seeing from Earth
Solar System - the Sun and all the planets that go round it
sphere - an object that is round in shape like a ball
star - a large ball of burning gas in space
time zones - one of the areas into which the world is divided where the time is calculated as being a particular number of hours behind or ahead of GMT (Greenwich Mean Time)
universe - the whole of space and all the stars, planets, and other forms of matter and energy in it