

## Progression of Knowledge - Physics

### Seasonal Changes

#### Year 1

- I can name the 4 seasons
- I can describe types of weather
- I can observe and describe changes that occur over the seasons
- I can describe changes in daylight within the 4 seasons
- I can explain that weather is coldest in winter and that deciduous trees have no leaves at this time
- I can explain that weather gets warmer in spring and leaves begin to grow on trees
- I can explain that weather is hottest in summer and trees have full green leaves
- I can explain that the weather starts to get colder in autumn and leaves turn brown and fall off deciduous trees
- I can begin to link specific months with a season

#### Vocabulary

Seasons, spring, summer, autumn, winter, deciduous, daylight, hotter, colder, temperature, wind, rain, cloud, snow

### Forces (including magnetism)

#### Year 3

- I can define forces
- I can explain what friction is
- I can compare how things move on different surfaces
- I can notice that some forces need contact between two objects but magnetic forces do not
- I can observe that magnets attract and repel each other
- I can explain the forces of attraction and repulsion
- I can describe magnets as having two poles
- I can observe that magnets attract magnetic materials but not others
- I can compare and group materials based on whether they are magnetic or not
- I can identify some magnetic materials (iron, nickel and cobalt)
- I can give a basic definition of a magnetic field
- I can predict whether two magnets will attract or repel each other based on which way their poles are facing

#### Year 5

- I can describe what forces can do to an object
- I can explain that unsupported objects fall due to gravity acting between the Earth and the object (Earth's gravitational pull)
- I can measure the weight of an object in newtons
- I can explain that the gravitational pull on Earth is more than the Moon because Earth has a larger mass
- I can explain who Isaac Newton is
- I can define friction
- I can identify the effects of water resistance, air resistance and buoyancy that act between moving surfaces
- I can describe how to reduce the effect of water and air resistance through streamlining
- I can recognise that pulleys, levers and gears can allow a smaller force to have a greater effect

#### Vocabulary

Forces, friction, surface, pushes, pulls, magnet, magnetic field, magnetic, poles, repel, attract, north pole, south pole, non-magnetic

Gravity, Earth's gravitational pull, weight, mass, newtons, moon, Isaac Newton, water resistance, air resistance, buoyancy, streamlined, pulley, gears, cogs, levers

**Light**

*Year 3*

- I can define a light source
- I can explain what darkness is
- I can explain the need for light to see
- I can recognise that light reflects off surfaces
- I can explain ways to protect eyes from sunlight
- I can describe how shadows are formed by opaque objects
- I can define the words opaque, translucent and transparent
- I can find patterns in the way that the size of shadows change

*Year 6*

- I can explain what a light source is and identify different sources
- I can explain that light travels in straight lines
- I can explain that things can be seen because they give out or reflect light into the eye
- I can explain that we see due to light travelling from a source, reflecting and going into the eye
- I can identify and describe the function of parts of the eye (pupil, lens, retina and optic nerve)
- I can identify and describe the incident ray and reflected ray
- I can use the terms opaque, translucent and transparent when discussing materials in relation to light
- I can explain why shadows are the same shape as the objects casting them

*Vocabulary*

Light, ray, light source, dark, reflection, reflective, pupil, retina, shadow, opaque, translucent and transparent

Incident ray, reflected ray, travel, lens, optic nerve, function

**Sound**

*Year 4*

- I can identify how sounds are made through vibrations
- I can recognise that sounds travel through a medium (surface/air) to the ear and the eardrum
- I can explain that sounds travel in waves
- I can find patterns between the pitch of a sound and the features of the object that caused it
- I can find patterns between the volume of a sound and the strength of the vibrations (amplitude) that caused it
- I can recognise that sounds get fainter as the distance from the source increases

*Vocabulary*

Vibration, sound wave, volume, amplitude, pitch, ear, particles, distance, soundproof, absorb sound, eardrum

## Earth and Space

### Year 5

- I can define the solar system
- I can define a star
- I can describe the movement of the Earth and other planets in relation to the sun (using the term orbit) and link this to the length of a year (links to gravity within forces Y5)
- I can define the moon using the term satellite correctly and understanding they exist around other planets
- I can describe the movement of the moon in relation to Earth (using the term orbit)
- I can define a planet and the sun (using the term spherical bodies)
- I can explain that Earth rotates on an axis and link this with the length of a day
- I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky
- I can define the term astronomer

### Vocabulary

Sun, star, moon, satellite, planet, sphere, spherical body, solar system, orbit, rotate, axis, astronomer

## Electricity

### Year 4

- I can identify different power sources
- I can identify common appliances that run on electricity (mains and battery powered)
- I can begin to use the term electric current (not necessarily being able to define it fully)
- I can explain that an electric circuit has to be a complete loop to work
- I can construct a simple series circuit
- I can identify and name the parts in a simple series circuit (including cells, wires, bulbs, switches and buzzers)
- I can draw a simple series circuit pictorially (not using conventional circuit symbols)
- I can identify if a lamp will work or not if it is a part of a complete loop with a battery
- I can recognise that a switch opens or closes a circuit (associating this with whether or not a lamp lights in a simple series circuit)
- I can define the terms conductor and insulator
- I can recognise some common conductors and insulators
- I can associate metals with being good conductors

### Year 6

- I create and draw simple series circuits using the correct symbols
- I can define electric current and resistance
- I can associate the brightness of a lamp or the noise of a buzzer with the number and voltage of cells used in the circuit
- I can compare and give reasons for variations in how a lamp functions in circuits
- I can compare and give reasons for variations in how a buzzer functions in circuits
- I can compare and give reasons for variations in how components function depending on the position of the switch (on or off)
- I can define a series circuit

### Vocabulary

Electricity, electric current, electrons, generate, power source, appliances, conductor, insulator, circuit, cell, battery, bulb, lamp, switch, buzzer

Series circuit, voltage, resistance, component, symbols, electric current, positive, negative