Physics Progression Document - updated May 2024

National Curriculum statements in red are from other linked topics.

LIGHT				
	Topic	**NC objectives covered by the topic**	**Substantive knowledge**	**Tier 3 Vocabulary**
YEAR 1/2	**Human body and senses (A)**	• Say which part of the body is associated with each sense.		
	Properties and uses of materials (B)	• Describe the simple physical properties of a variety of everyday materials.		
YEAR 3/4	**Light and shadows (B)**	• recognise that light is needed in order to see things and that dark is the absence of light • notice that light is reflected from surfaces • recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • recognise that shadows are formed when the light from a light source is blocked by a solid object • find patterns in the way that the size of shadows change.	• *Light comes from light sources. Dark is the absence of light. Nothing can be seen if there is no light. Objects are easier to see when there is more light.* • *Shiny materials and objects are good reflectors of light. When there is less light more reflective materials are easier to see than less reflective ones.* • *Shadows are formed when light is blocked. Objects made from opaque materials cast the darkest shadows.* • *Shadows are the same shape as the objects that cast them.* • *Light from the sun can be dangerous so we need to protect our eyes.* • *The size and position of a shadow can be changed by moving the light source*	*absence/absent* *artificial* *block* *surface* *bright* *dark/darkness* *dim* *light* *light source* *lux (lx)* *opaque* *reflect* *reflective* *sensor* *shadow* *Sun* *Sunlight* *Translucent* *transparent* *ultraviolet (UV)*

YEAR 5/6	**What light does (A)**	• recognise that light appears to travel in straight lines • use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them • investigate and explain the effects of refraction • use knowledge of reflection and refraction to explain how we see colours	• *Light appears to travel in straight lines.* • *We can see a light source because some of the light from the source enters our eyes.* • *Light travelling in straight lines can be used to explain why a shadow is the same shape as the object that casts it and how the shape of shadows can be changed.* • *Light is reflected from shiny surfaces in a predictable way because it travels in straight lines.* • *We can see objects because they reflect some of the light that falls onto them into our eyes*	*light ray* *reflection dark/darkness* *light source* *opaque* *reflect* *reflective* *shadow* *transparent* *translucent*

SOUND				
	Topic	**NC objectives covered by the topic**	**Substantive knowledge**	**Tier 3 Vocabulary**
YEAR 1/2	**Human body and senses (A)**	• *say which part of the body is associated with each sense.*		
YEAR 3/4	**Sound (B)**	• Identify how sounds are made associating some of them with something vibrating • Recognise that vibrations from sound travel through a medium to the ear • Find patterns between: The pitch of a sound and features of the object that produced it • Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Recognise that sounds get fainter as the distance from the sound source increases	• *Sounds are made by something vibrating; this is the source. Different sources make different sounds.* • *Vibrations travel from the source through a material to the ear so that we can hear them.* • *Sounds can be quiet or loud; volume depends on the size of the vibrations.* • *Sounds get fainter as the distance from the sound source increases.* • *Sounds can be high or low in pitch. Pitch depends on the size of the object vibrating.* • *The pitch of a note played on a stringed instrument depends on the length, thickness and tautness of the vibrating string. Year Module*	*Air* *decibel (dB)* *gas* *Liquid* *Pitch* *Solid* *Sound* *sound source* *vibrate/vibration* *volume* *material* *sensor*

FORCES				
Year	**Topic**	**NC objectives covered by the topic**	**Substantive knowledge**	**Tier 3 Vocabulary**
EYFS	**Colour and pattern**	ELG: The Natural World Understand some important processes and changes in the natural world.	• *Ballon rocket experiment*	*up, down, top, bottom, surface, move, roll, drop, fly, turn, spin, fall, fast, slow, faster, slower, fastest, slowest, further, furthest, wind, air, (water, blow, bounce float, sink)*
YEAR 1/2	**Changing materials (A)**	• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		
YEAR 3/4	**Forces, friction and magnets (A)**	• Compare how things move on different surfaces • Notice that some forces need contact between two objects, but magnetic forces can act at a distance • Observe how magnets attract or repel each other and attract some materials and not others • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials • Describe magnets as having two poles • Predict whether two magnets will attract or repel each other, depending on which poles are facing	• *A force is a push or pull that can make something move.* • *The surface a spinning top is moving on affects how long it spins for* • *The surface on which an object rests affects how it slides.* • *Magnets have a North and a South pole. Unlike poles attract and like poles repel each other.* • *Some metals are attracted to a magnet and are known as magnetic. Other materials are not.* • *The strength of magnets varies and can be tested using the idea that magnetic forces act at a distance*	*attract* *Force* *like poles* *magnet* *magnetic* *non- contact force: north/south pole* *repel*

YEAR 5/6	**Forces and mechanisms (B)**	• explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effects of air resistance, water resistance and friction, that act between moving surfaces • recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect	• *Friction is a force that makes it harder to move an object across a surface or slows down an object moving over a surface.* • *The unit of measurement of a force is Newtons (abbreviated to N).* • *Gravity is a force that pulls all objects to the centre of the Earth.* • *Air resistance is a force that slows down an object moving through air.* • *The amount of air resistance depends on the surface area of the object.* • *It is air resistance, not the object's weight, that affects how quickly an object falls.* • *Water resistance is a force that slows down an object moving through water.* • *The amount of water resistance depends on the shape of the object.* • *A pulley a mechanism used for lifting heavy objects (the load) by applying a pulling force at one end of rope attached to the load which passes over a wheel.* • *A lever is a long rigid arm that rests on a pivot. A force is applied to one part of the lever to lift the load at another point on the lever.* • *A gear is a mechanism which consists of wheels with teeth that slot together. Gears change the direction of movement and the force required to make something move.*	*air resistance* *force meter* *friction* *fulcrum* *gears* *gravity* *impact* *lever* *load* *magnetism* *mechanism* *Newton (N)* *Oppose* *Pivot* *Pulley* *water resistance* *contact force* *force* *non-contact force*

ELECTRICITY

	Topic	NC objectives covered by the topic	Substantive knowledge	Tier 3 Vocabulary
YEAR 3/4	***Electricity: circuits (A)***	• *Identify common appliances that run on electricity* • *construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers* • *identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery* • *recognise some common conductors and insulators, and associate metals with being good conductor* • *recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit*	• *Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries.* • *An electrical circuit consists of a cell or battery connected to a component using wires.* • *A switch can be added to a circuit to turn the component on and off.* • *If there is a break in a circuit, a loose connection or a short circuit, the component will not work.* • *Metals are good electrical conductors. Non-metals are generally electrical insulators except for graphite (pencil lead), human tissue and water.*	*device* *appliance* *flow* *Wire* *Battery* *Bulb* *Buzzer* *Cell* *Circuit* *closed circuit* *connection points* *electrical appliance* *electrical component* *electrical conductor* *electrical insulator* *electricity* *mains* *motor* *open circuit* *switch*
YEAR 5/6	***Electricity: changing circuits (A)***	• *associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.* • *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* • *use recognised symbols when representing a simple circuit in a diagram*	• *Circuits diagrams using standard symbols are used to record circuits.* • *Adding cells to a circuit makes a lamp brighter. A lamp gets brighter if the voltage in the circuit is increased.* • *A lamp gets dimmer if thinner wires are used.* • *If the voltage is increased in a circuit a buzzer makes a louder sound and a motor turns more quickly.*	*standard symbol* *voltage* *volts* *battery* *cell* *circuit* *connection points* *electrical component* *electrical conductor* *electrical insulator* *electricity* *lux (lx)* *switch*

EARTH IN SPACE

Year	Topic	NC objectives covered by the topic	Substantive knowledge	Tier 3 Vocabulary
EYFS	**Colour and pattern**	ELG: The Natural World Understand some important processes and changes in the natural world.	• *Exploring space books and vocabulary cards*	Sun, Moon, Earth, star, planet, sky, day, night, space, round, bounce, float
YEAR 1/2	**Seasonal changes (A)**	• Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.		
YEAR 5/6	**Earth and space (B)**	• describe the movement of the Earth and other planets relative to the sun in the solar system • describe the movement of the moon relative to the Earth • describe the sun, Earth and moon as approximately spherical bodies • use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	• *The main bodies that are found in space are the Sun, Moon, Earth and planets. They are all spherical.* • *The Earth and the other planets all orbit the Sun. The time it takes to complete one orbit is called a year.* • *The other planets of our solar system also orbit the Sun at different distances and taking different times to complete one orbit.* • *The Sun appears to move east to west in an arc across the sky from sunrise to sunset. Changes in shadows during the day can be explained by the changes in the position of the Sun.* • *The Earth rotates on its axis and this causes day and night, the apparent movement of the Sun across the sky and changes in shadows.* • *The Moon orbits the Earth every 28 days and rotates on its axis.*	*Dawn* *Dusk* *Horizon* *Midday* *Spherical* *Sunrise* *Sunset* *Axis* *Moon* *Orbit* *planet* *Rotate* *solar system* *star* *gas* *year*