Science Overview Autumn 2

Science	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit	Everyday Materials	Microhabitats	Forces and Magnets	Electricity and Circuits	Properties and Changes	Light and Reflection
Outline	Identifying the difference between objects and materials, children explore their surroundings to find examples of each. They work scientifically by planning tests, making observations and recording data. Pupils use results to answer questions and sort and group materials based on their properties.	Developing their understanding of scientific enquiry, pupils learn that scientists use a range of skills to answer questions. They discover that microhabitats provide what minibeasts need to survive and carry out a survey to find out where different minibeasts live in the school grounds. They practise asking scientific questions and follow a method to investigate which conditions woodlice prefer. Pupils explore the job role of a botanist by identifying flowering plants.	Investigating the movement of vehicles on different surfaces, children learn about the impact of friction and compare uses and drawbacks. They broaden their experience in writing scientific methods and recording data as they investigate contact and non-contact forces. Pupils explore the properties of different magnets and use this to understand their uses.	Exploring appliances that use electricity in their setting, children learn how to work with electricity safely and build circuits. Pupils investigate electrical conductors and insulators and explore the relationship between the number of bulbs and bulb brightness. Real scenarios and historical discoveries inform children about scientific progression and home safety	Broadening their experience of the properties of materials, children investigate hardness, transparency and conductivity and consider how these properties influence the uses of materials. They explore reversible changes, including dissolving and changes of state. Children compare these to irreversible changes, including rusting, burning and mixing vinegar and bicarbonate of soda.	Broadening their experience of the properties of materials, children investigate hardness, transparency and conductivity and consider how these properties influence the uses of materials. They explore reversible changes, including dissolving and changes of state. Children compare these to irreversible changes, including rusting, burning and mixing vinegar and bicarbonate of soda.

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Learning objectives	• To identify everyday materials. Working scientifically: To sort objects into groups based on the materials they are made from. • To recognise the difference between objects and materials. • To describe the properties of materials. • To group materials based on their properties (absorbency). Working scientifically: To make observations and record data. • To group materials based on their properties (waterproofness).	• Working scientifically: To classify a variety of minibeasts. • Working scientifically: To recognise how scientists answer questions. • To recognise that living things live in habitats to which they are suited. Working scientifically: To gather and record data to answer a question. • Working scientifically: To ask questions and plan how to carry out an experiment. • Working scientifically: To carry out an experiment and record data in a table. • To identify a variety of	• Knowledge: To describe the effects of contact forces. Working scientifically: To label a diagram using arrows and scientific vocabulary. • Knowledge: To recognise the effects and uses of forces. Working scientifically: To write a scientific conclusion identifying cause and effect. • Knowledge: To interpret how and why things move differently on different surfaces. Working scientifically: To plan an investigation using variables. • Knowledge: To describe the effects of magnets. Working	• To recognise how electrical appliances are powered. Working scientifically: To record and classify qualitative data. • To construct an electrical circuit. Working scientifically: To draw a scientific diagram. • To explain the use of switches in a circuit. • To explain the use of materials as electrical conductors or insulators. Working scientifically: To write a method. • To investigate what affects bulb brightness. Working scientifically: To pose questions and plan ways to test them.	• Knowledge To determine the hardness of materials and link this to their uses. Working scientifically To evaluate the hardness test to determine the degree of trust in the results. • Knowledge To determine the transparency of different materials and link this to their uses. Working scientifically: To plan and draw a table of results. • Knowledge To determine the conductivity of different materials and link this to their uses. Working scientifically: To write a detailed, organised method which is easy to follow.	• To describe the pathway of light. Working scientifically: To use evidence to form conclusions. • To describe how we see. Working scientifically: To draw scientific diagrams. • To explain how shadows change. Working scientifically: To pose questions. • To investigate what affects the angle of the reflected ray. Working scientifically: To record

	Working scientifically: To plan a test and suggest what might happen. • To group materials based on their properties (toughness). Working scientifically: To answer questions based on results.	flowering plants. Science in action: To understand the role of a botanist.	scientifically: To write a method. • Knowledge: To compare the properties of different types of magnets. Working scientifically: To display data using a bar chart. • Knowledge: To explain the uses of magnets. Working scientifically: To research the uses of magnets.	• To explain how to be safe around electricity. Science in action: To explore how scientific advances inform safety advice.	• Knowledge: To demonstrate reversible changes. Working scientifically: To write a prediction using prior knowledge of the states of matter. • Knowledge: To demonstrate irreversible changes. Working scientifically: To analyse observations about rusting and use them to support a conclusion. • Knowledge: To demonstrate irreversible changes. Working scientifically: To measure the circumference of a balloon accurately.	results as a line graph. • To explain how a periscope works. • To explain how mirrors are helpful. Science in action: To explore different jobs or inventions that depend on reflection.
Key Skills	• Name objects and identify the materials they are made from.	• Identify and name a variety of plants and animals.	• Identify examples of pushes, pulls and twists. • Define a force, including	• Recall a range of electrical appliances and classify them as	• Determine the hardness of different materials and link this to their uses.	• Compare sources of light and explain how the eye is protected from light.

	• Recognise that objects are made from materials that suit their purpose. • Recall that a property is how a material can be described. • Sort objects based on the materials they are made from. • Group objects based on their properties. • Suggest ways to test materials for their properties. • Make predictions and recognise whether they were accurate. • Use their observations to answer questions. Begin to recognise if a test is fair.	• Recall that minibeasts live in microhabitats. • Describe microhabitats and their conditions. • Describe how microhabitats provide for the basic needs of animals and plants. • Describe the job role of a botanist. • Group minibeasts and create simple classification keys. • Ask questions and recognise that they can be answered in different ways. • Gather and record data and use it to answer questions. • Plan what observations to make in an experiment.	describing, naming and classifying contact and non-contact forces. • Describe the relationship between friction and the roughness of a surface. • Identify examples of friction being useful or not. • Predict attraction and repulsion between like and opposite poles. • Identify examples of magnetic and non-magnetic materials. • Name some examples of types of magnets and compare their strengths. • Describe some examples of the uses of magnets. • Use arrows and scientific	mains or battery-powered. • Explain why something is either mains or battery-powered. • Explain how to test if a circuit works and identify when simple electric circuits will work. • Identify symbols for open and closed switches. • Predict whether a circuit will work based on whether the switch is open or closed and explain that it works by breaking and completing a circuit. • Give examples of how switches are useful. • Describe that a material is a good electrical conductor when it is added to an	• Determine the transparency of different materials and link this to their uses. • Determine the thermal and electrical conductivity of different materials and link this to their uses. • Demonstrate, identify and describe reversible and irreversible changes. • Evaluate the hardness test to determine the degree of trust in the results. • Plan and draw a table of results. Write a detailed, organised and easy to follow method. • Write a prediction using prior knowledge of the states of matter.	• Describe how light travels and how we see luminous and non-luminous objects. • Recall factors that affect the size of a shadow and describe how the distance between an object and the surface its shadow is cast on affects the size of the shadow. • Use ray diagrams to explain why shadows change size and why the shape of a shadow matches the object that cast it. • Recall what happens to light when it reaches a smooth mirror surface. • Identify the incoming and reflected rays and describe the relationship

		• Order the steps of a method. • Describe the appearance of flowering plants. • Use an identification chart to name flowering plants.	vocabulary to show the direction of a contact force. • Use evidence to support conclusions. • Identify the variables to change, measure and control. • Write a method to explain how to use a magnet to sort and classify materials as magnetic or non-magnetic. • Label the axes of a bar chart. • Draw bars on a chart accurately. Identify key information from a source. • Use more than one source to research a question.	electric circuit and the bulb lights. • Describe that a material is a good electrical insulator when it is added to an electric circuit and the bulb does not light. • Recall that metals, for example, are good electrical conductors and plastics, for example, are good electrical insulators. • Describe that the more bulbs added to a series circuit, the dimmer the bulbs will be. • Explain that the bulbs will be dimmer when more are added to a circuit, as less energy is transferred to each of them. • Describe precautions for	• Analyse observations about rusting and use them to support a conclusion. • Measure accurately in centimetres.	between their angles. • Use mirrors to make a working periscope and explain how a periscope works using ray diagrams. • Recall a range of uses of mirrors and reflection and describe how a mirror reflects light in different situations. • Explain how light is reflected using knowledge of light and reflection. Make observations about the properties of light. • Use my observations as evidence to support conclusions about light. • Draw ray diagrams. Pose testable questions in response to observations.

				working safely with electricity. • Explain some precautions using knowledge of circuit diagrams, electrical components, conductors or insulators. • Draw a results table and record a range of appliances under the correct headings 'Mains' or 'Batteries'. • Identify and draw simplified electric circuit symbols and use these to draw a simplified circuit diagram. • Write a method for the investigation that considers appropriate equipment, ordering clearly written steps and considering safety.		• Record my measurements as a line graph. • Use my line graph to extrapolate data and make predictions about missing values. • Recall various jobs or inventions that use mirrors and reflection.

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				• Pose questions relating to bulbs in an electrical circuit. • Explain why a selected question is testable. • Suggest that new inventions will change safety advice.		
Key Vocab	absorbent data fabric glass group material metal object opaque plastic property rock tough transparent waterproof wood	botanist camouflage characteristics classification key classify comparative/fair test conclusion criteria data food chain identify invertebrate method microhabitat minibeast research results species survey tally	attract contact force electromagnet force friction magnet magnetic material magnetism non-contact force non-magnetic material north pole repel south pole	ammeter appliance battery bulb buzzer cell circuit component electrical conductor electrical insulator electricity hazard mains material	burning change of state circumference condensing conductor dissolve electrical conductivity evaporating freezing hard hardness insulator irreversible change light intensity light meter melting mixture opaque property reversible change	cast incoming ray light ray light source luminous mirror non-luminous opaque periscope pupil ray diagram reflected ray reflective shadow
Key Questions	Which material comes from trees?	What is a microhabitat?	Which force comes from a magnet?	Name a power supply. What does a buzzer do?	Name a material that is a good conductor.	Light travels in a ____ line.

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	Name a property of rock. Name a transparent material.	In which microhabitat would you most likely find worms? What do badgers eat?	Name a magnetic material. Can you name an example of when friction can be helpful?	What does a switch do in a circuit? Name a good electrical conductor.	What property is a measure of how easily a material is scratched or dented? Which type of material lets light pass through, scattering it and causing objects to appear fuzzy or distorted? What process reverses condensing? What does a light meter measure? What two conditions are needed for rusting?	What does light never do when it reaches a surface? Where does light enter the eye?