

Science Intention Map

Lower Key Stage Two



Placing learning at the heart of everything we do.



Lower KS2 Intention Map 2021 - 2022



Learning Intentions

1. Ask questions about the world around them and explain that they can be answered in different ways.
2. Take measurements in standard units, using a range of simple equipment.
3. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen.
4. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections.
5. Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements.
6. Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy.
7. Compare and group materials based on their magnetic properties.
8. Investigate and compare a range of magnets (bar, horseshoe and floating) and explain that magnets have two poles (north and south) and that opposite poles attract each other, while like poles repel each other.
9. Compare how objects move over surfaces made from different materials.
10. Explain that an object will not move unless a push or pull force is applied, describing forces in action and whether the force requires direct contact or whether the force can act at a distance (magnetic force).
11. Make working models with simple mechanisms or electrical circuits.

How mighty are magnets? What does friction do? (Mighty Metals)



Knowledge Intentions

1. Questions can help us find out about the world and can be answered in different ways.
2. Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers ($^{\circ}\text{C}$) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement.
3. Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge.
4. An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.
5. Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.
6. Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.
7. Some materials have magnetic properties. Magnetic materials are attracted to magnets. All magnetic materials are metals but not all metals are magnetic. Iron is a magnetic metal.
8. Magnets have two poles (north and south). Opposite poles (north and south) attract each other, while like poles (north and north, or south and south) repel each other.
9. Friction is a force between two surfaces as they move over each other. Friction slows down a moving object. Smooth surfaces usually generate less friction than rough surfaces.
10. An object will not move unless a pushing or pulling force is applied. Some forces require direct contact, whereas other forces can act at a distance, such as magnetic force.

End product: evidence of an investigation leading to the identification of magnetic materials.

Lower KS2 Laboratory



William Gilbert

Michael Faraday





Do plants have legs? What are flowers for? (Tribal Tales)



Learning Intentions

1. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen.
2. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections.
3. Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy.
4. Describe the requirements of plants for life and growth (air, light, water, nutrients and room to grow) and how they vary from plant to plant.
5. Find patterns in the way shadows change during the day.
6. Explain, using words or diagrams, how shadows are formed when a light source is blocked by an opaque object.
7. Draw and label the life cycle of a flowering plant.
8. Name and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers)

Knowledge Intentions

1. Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge.
2. An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.
3. Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.
4. Plants need air, light, water, minerals from the soil and room to grow, in order to survive. Different plants have different needs depending on their habitat. Examples include cacti, which need less water than is typical, and ferns, which can grow in lower light levels.
5. Shadows change shape and size when the light source moves. For example, when the light source is high above the object, the shadow is short and when the light source is low down, the object's shadow is long.
6. A shadow is formed when light from a light source, such as the Sun, is blocked by an opaque object. Transparent objects allow light to pass through them and do not create shadows.
7. Flowers are important in the life cycle of flowering plants. The stages of a plant's life cycle include germination, flower production, pollination, fertilisation, seed formation and seed dispersal. Insects and the wind can transfer pollen from one plant to another (pollination). Animals, wind, water and explosions can disperse seeds away from the parent plant (seed dispersal).
8. The plant's roots anchor the plant in the ground and transport water and minerals from the ground to the plant. The stem (or trunk) support the plant above the ground. The leaves collect energy from the Sun and make food for the plant. Flowers make seeds to produce new plants.
9. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.

End product: evidence of an investigation into plant life cycles leading to a labelled drawing

Lower KS2 Laboratory



David Bellamy

Agnes Arber





How far can sound travel? How can we change sound? (Tremors)



Learning Intentions

1. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen.
2. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections.
3. Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy.
4. Compare and group rocks based on their appearance, properties or uses.
5. Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.
6. Explain how sounds are made and heard using diagrams, models, written methods or verbally.
7. Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately.
8. Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs).
9. Compare how the volume of a sound changes at different distances from the source.
10. Take accurate measurements in standard units, using a range of equipment
11. Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections.
12. Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them.
13. Compare and find patterns in the volume of a sound, using a range of equipment, such as musical instruments.
14. Compare and find patterns in the pitch of a sound, using a range of equipment, such as musical instruments.
15. Explain how sounds are made and heard using diagrams, models, written methods or verbally.

Knowledge Intentions

1. Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge.
2. An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.
3. Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.
4. There are three different rock types: sedimentary, igneous and metamorphic. Sedimentary rocks form from mud, sand and particles that have been squashed together over a long time to form rock. Examples include sandstone and limestone. Igneous rocks are made from cooled magma or lava. They usually contain visible crystals. Examples include pumice and granite. Metamorphic rocks are formed when existing rocks are heated by the magma under the Earth's crust or squashed by the movement of the Earth's tectonic plates. They are usually very hard. Examples include slate and marble.
5. Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.
6. When an instrument is played, the air around or inside it vibrates. These vibrations travel as a sound wave. Sound waves travel through a medium, such as air or water, to the ear.
7. Pitch is how high or low a sound is. Parts of an instrument that are shorter, tighter or thinner produce high-pitched sounds. Parts of an instrument that are longer, looser or fatter produce low-pitched sounds.
8. Sounds are louder closer to the sound source and fainter as the distance from the sound source increases.
9. Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C), and metre sticks, rulers or trundle wheels (millimetres, centimetres, metres).
10. Questions can help us find out about the world and can be answered using scientific enquiry.
11. Volume is how loud or quiet a sound is. The harder an instrument is hit, plucked or blown, the stronger the vibrations and the louder the sound.
12. Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed, and all others remain constant.

Lower KS2 Laboratory

Alexander Graham Bell



End product: evidence of an investigation into how sound travels and how the ear works – draw a labelled diagram of an ear.



Why did Icarus fall from the sky? How fast does water flow? (Gods and Mortals)



Learning Intentions

1. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen.
2. Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements.
3. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections.
4. Ask questions about the world around them and explain that they can be answered in different ways.

Knowledge Intentions

1. Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge.
2. Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.
3. An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.
4. Questions can help us find out about the world and can be answered in different ways.

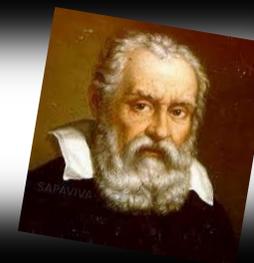
End product: evidence of an investigation into gravity and how to counteract the effects of gravity.

Lower KS2 Laboratory



Sir Isaac Newton

Galileo





Why are trees tall? What is soil? (Flow)



Learning Intentions

1. Ask questions about the world around them and explain that they can be answered in different ways.
2. Take measurements in standard units, using a range of simple equipment.
3. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen.
4. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections.
5. Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements.
6. Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy.
7. Name and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers)
8. Investigate soils from the local environment, making comparisons and identifying features.
9. Investigate how water is transported within plants.

Knowledge Intentions

1. Questions can help us find out about the world and can be answered in different ways.
2. Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement.
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5. Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.
6. Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.
7. The plant's roots anchor the plant in the ground and transport water and minerals from the ground to the plant. The stem (or trunk) support the plant above the ground. The leaves collect energy from the Sun and make food for the plant. Flowers make seeds to produce new plants.
8. Soils are made from tiny pieces of eroded rock, air and organic matter. There are a variety of naturally occurring soils, including clay, sand and silt. Different areas have different soil types.
9. Water is transported in plants from the roots, through the stem and to the leaves, through tiny tubes called xylem.

End product: evidence of an investigation into different type of soil leading to being able to recognise the different properties.

Lower KS2 Laboratory



Justus Von Liebig

Megan Balks





What do Owls eat? How do fossils form?

(Predators, Animal nutrition and skeletal system yr3)



Learning Intentions

1. Explain the importance and characteristics of a healthy, balanced diet.
2. Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy.
3. Take measurements in standard units, using a range of simple equipment.
4. Describe simply how fossils are formed, using words, pictures or a model.
5. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen
6. Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements.
7. Ask questions about the world around them and explain that they can be answered in different ways.
8. Compare and contrast the diets of different animals.
9. Describe how humans need the skeleton and muscles for support, protection and movement.
10. Explain the importance and characteristics of a healthy, balanced diet.
11. Identify and group animals that have no skeleton, an internal skeleton (endoskeleton) and an external skeleton (exoskeleton).
12. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections.

Knowledge Intentions

1. Humans have to get nutrition from what they eat. It is important to have a balanced diet made up of the main food groups, including proteins, carbohydrates, fruit and vegetables, dairy products and alternatives, and fats and spreads. Humans need to stay hydrated by drinking water.
2. Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.
3. Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement.
4. Fossils form over millions of years and are the remains of a once-living organism, preserved as rock. Scientists can use fossils to find out what life on Earth was like in prehistoric times. Fossils form when a living thing dies in a watery environment. The body gets covered by mud and sand and the soft tissues rot away. Over time, the ground hardens to form sedimentary rock and the skeletal or shell remains turn to rock.
5. Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge.
6. Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.
7. Animals cannot make their own food and need to get nutrition from the food they eat. Carnivores get their nutrition from eating other animals. Herbivores get their nutrition from plants. Omnivores get their nutrition from eating a combination of both plants and other animals.
8. Humans have a skeleton and muscles for movement, support and protecting organs. Major bones in the human body include the skull, ribs, spine, humerus, ulna, radius, pelvis, femur, tibia and fibula. Major muscle groups in the human body include the biceps, triceps, abdominals, trapezius, gluteals, hamstrings, quadriceps, deltoids, gastrocnemius, latissimus dorsi and pectorals.
9. Some animals have skeletons for support, movement and protection. Endoskeletons are those found inside some animals, such as humans, cats and horses. Exoskeletons are those found on the outside of some animals, such as beetles and flies. Some animals have no skeleton, such as slugs and jellyfish.
10. Recognise that living things can be grouped in a variety of ways.

End product: evidence of an investigation into grouping food leading to being able to design a balanced diet for the day.



Lower KS2 Intention Map 2022 - 2023



How do plugs work? What conducts electricity? (I am Warrior)



Learning Intentions

1. Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs).
2. Construct operational simple series circuits using a range of components and switches for control.
3. Describe materials as electrical conductors or insulators.
4. Compare common household equipment and appliances that are and are not powered by electricity.

Knowledge Intentions

1. Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.
2. Electrical components include cells, wires, lamps, motors, switches and buzzers. Switches open and close a circuit and provide control.
3. Electrical conductors allow electricity to flow through them, whereas insulators do not. Common electrical conductors are metals. Common insulators include wood, glass, plastic and rubber.
4. Electricity is a type of energy. It is used to power many everyday items, such as kettles, computers and televisions. Electricity can also come from batteries. Batteries eventually run out of power and need to be recycled or recharged. Batteries power devices that can be carried around, such as mobile phones and torches.
5. Identify common appliances that run on electricity.

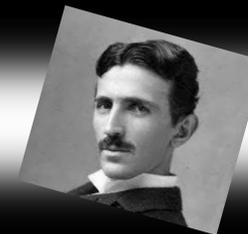
End product: evidence of an investigation into electricity and how it travels leading to an understanding how a basic circuit works and being able to draw and label a simple diagram.

Lower KS2 Laboratory



George Ohm

Nikola Tesla





Are all liquids runny? How do smells get up our nose? (Potions)

Learning Intentions

1. Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them
2. Take accurate measurements in standard units, using a range of equipment.
3. Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately.
4. Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections
5. Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.
6. Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs).
7. Group and sort materials into solids, liquids or gases.
8. Observe and explain that some materials change state when they are heated or cooled and measure or research the temperature in degrees Celsius ($^{\circ}\text{C}$) at which materials change state.

Knowledge Intentions

1. Questions can help us find out about the world and can be answered using scientific enquiry.
2. Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers ($^{\circ}\text{C}$), and metre sticks, rulers or trundle wheels (millimetres, centimetres, metres).
3. Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed, and all others remain constant.
4. An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.
5. Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.
6. Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.
7. Materials can be grouped according to whether they are solids, liquids or gases. Solids stay in one place and can be held. Some solids can be squashed, bent, twisted and stretched. Examples of solids include wood, metal, plastic and clay.
8. Heating or cooling materials can bring about a change of state. This change of state can be reversible or irreversible. The temperature at which materials change state varies depending on the material. Water changes state from solid (ice) \rightleftharpoons liquid (water) at 0°C and from liquid (water) \rightleftharpoons gas (water vapour) at 100°C . The process of changing from a solid to liquid is called melting. The reverse process of changing from a liquid to a solid is called freezing. The process of changing from a liquid to a gas is called evaporation. The reverse process of changing from a gas to a liquid is called condensation.

End product: evidence of an investigation into different substances, sorting into solids, liquids and gases as well as being able to recognise and describe the different properties.

Lower KS2 Laboratory



Alexander Fleming



Where does water go? Why does it flood? (Misty Mountain Sierra)

Learning Intentions

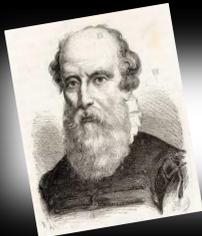
1. Take accurate measurements in standard units, using a range of equipment.
2. Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs).
3. Describe how environments can change due to human and natural influences and the impact this can have on living things.
4. Explain how adaptations help living things to survive in their habitat.
5. Observe and explain that some materials change state when they are heated or cooled and measure or research the temperature in degrees Celsius ($^{\circ}\text{C}$) at which materials change state.
6. Describe the water cycle using words or diagrams and explain the part played by evaporation and condensation.
7. Explain how unfamiliar habitats, such as a mountain or ocean, can change over time and what influences these changes.
8. either eat the plant or other animals.
9. Animals need water, food, air and shelter to survive. Their habitat must provide all these things.

Knowledge Intentions

1. Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers ($^{\circ}\text{C}$), and metre sticks, rulers or trundle wheels (millimetres, centimetres, metres).
2. Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.
3. Humans can affect habitats in negative ways, such as littering, pollution and land development, or positive ways, such as garden ponds, bird boxes and wildflower areas.
4. An adaptation helps an animal or plant survive in its habitat. If living things are unable to adapt to changes within their habitat, they are at risk of becoming extinct.
5. Heating or cooling materials can bring about a change of state. This change of state can be reversible or irreversible. The temperature at which materials change state varies depending on the material. Water changes state from solid (ice) \rightleftharpoons liquid (water) at 0°C and from liquid (water) \rightleftharpoons gas (water vapour) at 100°C . The process of changing from a solid to liquid is called melting. The reverse process of changing from a liquid to a solid is called freezing. The process of changing from a liquid to a gas is called evaporation. The reverse process of changing from a gas to a liquid is called condensation.
6. The water cycle has four stages: evaporation, condensation, precipitation and collection. Water in lakes, rivers and streams is warmed by the Sun, causing the water to evaporate and rise into the air as water vapour. As the water vapour rises, it cools and condenses to form water droplets in clouds. The clouds become full of water until the water falls back to the ground as precipitation (rain, hail, snow and ice). The fallen water collects back in lakes, rivers and streams. Evaporation and condensation are caused by temperature changes.
7. Habitats change over time, either due to natural or human influences. Natural influences include extreme or unseasonable weather. Human influences include habitat destruction or pollution. These changes can pose a risk to animals and plants that live in the habitat.

End product: evidence of investigation into the water cycle and it's different stages

Lower KS2 Laboratory



Bernard Palissy



How did the Vikings dye their clothes? (Traders & Raiders, Plants Yr3)



Learning Intentions

1. Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately.
2. Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.
3. Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs).
4. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen.
5. Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements.
6. Draw and label the life cycle of a flowering plant.
7. Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy.
8. Take measurements in standard units, using a range of simple equipment.
9. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections.
10. Ask questions about the world around them and explain that they can be answered in different ways.
11. Investigate how water is transported within plants.
12. Name and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers).
13. Describe the requirements of plants for life and growth (air, light, water, nutrients and room to grow) and how they vary from plant to plant.

Knowledge Intentions

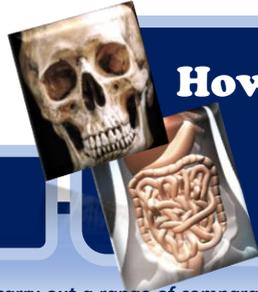
1. Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed, and all others remain constant.
2. Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge.
3. Flowers are important in the life cycle of flowering plants. The stages of a plant's life cycle include germination, flower production, pollination, fertilisation, seed formation and seed dispersal. Insects and the wind can transfer pollen from one plant to another (pollination). Animals, wind, water and explosions can disperse seeds away from the parent plant (seed dispersal).
4. Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.
5. Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.
6. Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement.
7. An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.
8. Questions can help us find out about the world and can be answered in different ways.
9. Water is transported in plants from the roots, through the stem and to the leaves, through tiny tubes called xylem.
10. The plant's roots anchor the plant in the ground and transport water and minerals from the ground to the plant. The stem (or trunk) support the plant above the ground. The leaves collect energy from the Sun and make food for the plant. Flowers make seeds to produce new plants.
11. Plants need air, light, water, minerals from the soil and room to grow, in order to survive. Different plants have different needs depending on their habitat. Examples include cacti, which need less water than is typical, and ferns, which can grow in lower light levels.

End product: evidence of investigation into the different needs of plants depending on their habitat

Lower KS2 Laboratory



Rachel Carson



How does toothpaste protect teeth? What is spit for? (Bottoms, Burps & Bile, Food and the digestive system Yr4)



Learning Intentions

1. Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately.
2. Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections.
3. Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.
4. Identify the four different types of teeth in humans and other animals and describe their functions.
5. Describe the purpose of the digestive system, its main parts and each of their functions.
6. Describe what damages teeth and how to look after them.
7. Animals need water, food, air and shelter to survive. Their habitat must provide all these things.
8. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen.
9. Compare and contrast the diets of different animals.
10. Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements.
11. Describe how humans need the skeleton and muscles for support, protection and movement.
12. Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy.
13. Take measurements in standard units, using a range of simple equipment.
14. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections.
15. Ask questions about the world around them and explain that they can be answered in different ways.
16. Identify and group animals that have no skeleton, an internal skeleton (endoskeleton) and an external skeleton (exoskeleton).

Knowledge Intentions

1. Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed, and all others remain constant.
2. An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.
3. Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.
4. There are four different types of teeth: incisors, canines, premolars and molars. Incisors are used for cutting. Canines are used for tearing. Premolars and molars are used for grinding and chewing. Carnivores, herbivores and omnivores have characteristic types of teeth. Herbivores have many large molars for grinding plant material. Carnivores have large canines for killing their prey and tearing meat.
5. The digestive system is responsible for digesting food and absorbing nutrients and water. The main parts of the digestive system are the mouth, oesophagus, stomach, small intestines, large intestines and rectum. The mouth starts digestion by chewing food and mixing it with saliva. The oesophagus transports the chewed food to the stomach, where it mixes with stomach acid and gets broken down into smaller pieces. In the small intestine, nutrients from the food are absorbed by the body. In the large intestine, water is absorbed by the body. The remaining undigested waste is stored in the rectum before excretion through the anus.
6. Regular teeth brushing, limiting sugary foods and visiting the dentist are important for good oral hygiene.)
7. Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge.
8. Animals cannot make their own food and need to get nutrition from the food they eat. Carnivores get their nutrition from eating other animals. Herbivores get their nutrition from plants. Omnivores get their nutrition from eating a combination of both plants and other animals.
9. Humans have a skeleton and muscles for movement, support and protecting organs. Major bones in the human body include the skull, ribs, spine, humerus, ulna, radius, pelvis, femur, tibia and fibula. Major muscle groups in the human body include the biceps, triceps, abdominals, trapezius, gluteals, hamstrings, quadriceps, deltoids, gastrocnemius, latissimus dorsi and pectorals.
10. Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions.
11. Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement.
12. Questions can help us find out about the world and can be answered in different ways.
13. Some animals have skeletons for support, movement and protection. Endoskeletons are those found inside some animals, such as humans, cats and horses. Exoskeletons are those found on the outside of some animals, such as beetles and flies. Some animals have no skeleton, such as slugs and jellyfish.

End product: evidence of investigation into what the digestive system does and it's main parts.

Lower KS2 Laboratory



William Beaumont



Why do cat's eyes glow? What are sunglasses for? (1066)

Learning Intentions

1. Take measurements in standard units, using a range of simple equipment.
2. Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements.
3. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections.
4. Explain why light from the Sun can be dangerous. (NC - recognise that they need light in order to see things and that dark is the absence of light)
5. Ask questions about the world around them and explain that they can be answered in different ways.
6. Describe the differences between dark light and how we need light to be able to see. (NC - recognise that they need light in order to see things and that dark is the absence of light)
7. Group and sort materials as being reflective or non-reflective.

Knowledge Intentions

1. Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers ($^{\circ}\text{C}$) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement.
2. Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected.
3. An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features.
4. Light from the Sun is damaging for vision and the skin. Protection from the Sun includes sun cream, sun hats, sunglasses and staying indoors or in the shade.
5. Questions can help us find out about the world and can be answered in different ways.
6. Dark is the absence of light, and we need light to be able to see.
7. Light can be reflected from different surfaces. Some surfaces are poor reflectors, such as some fabrics, while other surfaces are good reflectors, such as mirrors.

End product: evidence of an investigation into which surfaces reflect light the best and be able to recognise some of the properties required.

Lower KS2 Laboratory

Thomas Young





Checklist



Lower KS2 Working Scientifically

National Curriculum Programme of Study		2021-2022	2022-2023
Sc3-4/1.1a	asking relevant questions and using different types of scientific enquiries to answer them	T1, T3, T4, T5, T6	T2, T4, T5, T6
Sc3-4/1.1b	setting up simple practical enquiries, comparative and fair tests	T1, T2, T3, T4, T5, T6	T2, T4, T5
Sc3-4/1.1c	making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	T1, T3, T5, T6,	T2, T3, T4, T5, T6,
Sc3-4/1.1d	gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	T1, T2, T3, T5, T6,	T1, T2, T3, T4, T5
Sc3-4/1.1e	recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	T1, T2, T3, T5, T6,	T1, T3, T3, T4, T5
Sc3-4/1.1f	reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	T1, T3, T4, T5, T6,	T2, T4, T5, T6,
Sc3-4/1.1g	using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	T1, T3, T4, T5, T6,	T2, T4, T5, T6
Sc3-4/1.1h	identifying differences, similarities or changes related to simple scientific ideas and processes	T1, T2, T3, T4, T5, T6,	T4, T5, T6,
Sc3-4/1.1i	using straightforward scientific evidence to answer questions or to support their findings.	T3, T4, T5, T6,	T2, T4, T5, T6,

	Year A 2021 - 2022					
	T1	T2	T3	T4	T5	T6
Plants		█				
Living things & Habitats						
Animals including humans						█
States of matter						
Rocks						
Forces	█					
Light		█				
Sound			█			
Electricity						

Completed in depth

	Year B 2022 - 2023					
	T1	T2	T3	T4	T5	T6
				█		
			█	█		
					█	█
	█	█	█			
						█
	█					

Light touch, not every PoS addressed



Year Three



National Curriculum Programme of Study		2021-2022	2022-2023
Plants			
Sc3/2.1a	identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers	T2,	
Sc3/2.1b	explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant	T2,	
Sc3/2.1c	investigate the way in which water is transported within plants	T5, T6,	
Sc3/2.1d	explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	T2,	
Animals including humans			
Sc3/3.1a	identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.	T6,	
Sc3/3.1b	identify that humans and some other animals have skeletons and muscles for support, protection and movement.	T6,	
Rocks			
Sc3/4.1a	compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.	T3,	
Sc3/4.1b	describe in simple terms how fossils are formed when things that have lived are trapped within rock.	T6,	
Sc3/4.1c	recognise that soils are made from rocks and organic matter.	T5,	
Light			
Sc3/5.1a	recognise that they need light in order to see things and that dark is the absence of light		T6,
Sc3/5.1b	notice that light is reflected from surfaces		T6,
Sc3/5.1c	recognise that light from the sun can be dangerous and that there are ways to protect their eyes		T6,
Sc3/5.1d	recognise that shadows are formed when the light from a light source is blocked by an opaque object find patterns in the way that the size of shadows change	T2,	
Forces & Magnets			
Sc3/6.1a	compare how things move on different surfaces.	T1,	
Sc3/6.1b	notice that some forces need contact between 2 objects, but magnetic forces can act at a distance.	T1,	
Sc3/6.1c	observe how magnets attract or repel each other and attract some materials and not others.	T1,	
Sc3/6.1d	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	T1,	
Sc3/6.1e	describe magnets as having 2 poles	T1,	
Sc3/6.1f	predict whether 2 magnets will attract or repel each other, depending on which poles are facing	T1,	



Year Four



National Curriculum Programme of Study		2021-2022	2022-2023
<i>Living things & their habitats</i>			
Sc4/2.1a	recognise that living things can be grouped in a variety of ways.	T6	
Sc4/2.1b	explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	T2	
Sc4/2.1c	recognise that environments can change and that this can sometimes pose dangers to living things.	T5,	T3, T5,
<i>Animals including humans</i>			
Sc4/3.1a	describe the simple functions of the basic parts of the digestive system in humans.		T5,
Sc4/3.1b	identify the different types of teeth in humans and their simple functions.		T5,
Sc4/3.1c	construct and interpret a variety of food chains, identifying producers, predators and prey.		T5,
<i>States of matter</i>			
Sc4/4.1a	compare and group materials together, according to whether they are solids, liquids or gases.		T2,
Sc4/4.1b	observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).		T2, T3,
Sc4/4.1c	identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		T2, T3,
<i>Light</i>			
Sc4/5.1a	identify how sounds are made, associating some of them with something vibrating.	T3,	
Sc4/5.1b	recognise that vibrations from sounds travel through a medium to the ear.	T3,	
Sc4/5.1c	find patterns between the pitch of a sound and features of the object that produced it	T3,	
Sc4/5.1d	find patterns between the volume of a sound and the strength of the vibrations that produced it	T3,	
Sc4/5.1e	recognise that sounds get fainter as the distance from the sound source increases	T3,	
<i>Electricity</i>			
Sc4/6.1a	identify common appliances that run on electricity		T1,
Sc4/6.1b	construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers		T1,
Sc4/6.1c	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		T1,
Sc4/5.1d	recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit		T1,
Sc4/5.1e	recognise some common conductors and insulators, and associate metals with being good conductors		T1,