

Bluecoat Primary Academy Science Progression Document 2020

**Bluecoat Primary Academy Science Intent Statement**

At Bluecoat Primary Academy we believe a high-quality science education provides the foundations for understanding the world, by promoting experiences of exploring and investigating scientific phenomena in a range of contexts leading to a development of natural curiosity. Children will be encouraged to build their knowledge and understanding through asking questions, taking risks, experimenting, reflecting, making and learning from mistakes; whereby they acquire and apply core skills equipping them for an ever-changing diverse world.

**Science Progression Document Guide**

Key Ideas: provides an overview of the key ideas and procedural knowledge pupils should know by the end of the year.

Working scientifically: specifies the understanding of the nature, processes and methods of science for each year group and should be taught continuously encouraging pupils to use features of scientific enquiry to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data

Vocabulary: The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. Pupils should be encouraged to use this during lessons and refer back to in retrieval lessons.

Types of Working Scientifically:

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| **Identifying and Classifying** | **Comparative testing** | **Fair tests** | **Pattern seeking** | **Research** | **Ideas over time** |
| Increased focus on measuring and using data to answer ‘Big Questions’.  Continue to build on their observational skills, becoming more independent in identifying, through the use of increasingly complex tools, as well as developing higher order skills in reasoning and justification when explaining how they have chosen to group things.  Design simple tests to help them classify materials, as well as independently using a range of secondary sources to support them in identifying a range of living things. | Use an increasingly wide range of equipment to make measurements.  Learn what it means to measure accurately and check for reliability.  Learn to independently plan how to record and analyse the data, using tables, pictograms, and bar charts to compare the measurements they make.  Use bar charts to draw conclusions about what they have found out to be the answer to their ‘Big Question’.  Evaluate the procedure they used and the quality of their data, suggesting ways they could improve their test. | Plan their own tests to collect data. Through fair testing learn to understand the different types of variables:   * The dependent variable that they will change in their test, * The independent variable that they are going to measure so that they can find out how the dependent variable affects it, * The control variables which the children will need to keep the same so that they don’t affect the results.   Measure and record data that can be displayed in a scatter or line graph. Use their data to draw conclusions that identify a relationship. Become more systematic in how they approach fair tests more independently. Written conclusions to become more focussed on scientific explanations. Focus on their skills in evaluating their enquiries. | Decide what they should measure and observe.  Choose equipment that are appropriate to collect data.  Use a data logger to collect accurate data.  Using data analysis techniques to spot patterns.  Use data and graphs to support their explanations.  Use their findings to form and justify their own predictions, then propose further investigations to test predictions. | Reading for information and note-taking.  Learn to interpret information they find and critically consider its relevance.  Use a range of secondary sources, including books, websites and video.  Listen to professionals/experts to get information, ask questions/ interviews or send letters/emails.  Create questionnaires and interviews to collect data.  Evaluate the quality of information they have found and how well it has enabled them to draw conclusions and answer their ‘Big Question’. | Explore and talk about their own and other people’s scientific ideas.  Begin to recognise how scientific ideas change and develop over time.  Use a range of secondary sources of information  Develop their use of scientific language.  Explain ideas using their scientific knowledge and understanding.  Evaluate the significance, strengths and weaknesses of different scientists’ ideas. |

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| **Living Things and Their Habitats** | | | | |
| **National curriculum objectives:**  -recognise that living things can be grouped in a variety of ways  - explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment  - recognise that environments can change and that this can sometimes pose dangers to living things.  Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals, flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups, for example: fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects.  Note: plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, for example ferns and mosses.  Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation.  Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched. | | | **Key ideas:**   1. Living things can be divided into groups based upon their characteristics. 2. Environmental change affects different habitats differently. 3. Different organisms are affected differently by environmental change. 4. Different food chains occur in different habitats. 5. Human activity significantly affects the environment. | |
| **Prior Learning** |  | | | **Vocabulary** |
| **In Year 2:**  **-**explore and compare the difference between things that are living, dead and things that have never been alive.  **-**identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.  -identify and name a variety of plants and animals in their habitats, including micro habitats.  -describe how animals obtain their food from plants and other animals, using the ideas of a simple food chain, and identify and name the different sources of food. | **In any habitat there are food chains and webs where nutrients are passed from one organism to another when it is eaten. If the population of one organism in the chain or web is affected it has a knock on effect to all the others.**  **Environmental change (the seasons, human activity, and climate change) affects different organisms differently and therefore different habitats differently because all organisms in a habitat are interdependent.** | **Children should raise and explore questions that demand the identification and classification of creatures and plants in their local environment (insects, spiders, birds, mammals, reptiles and amphibians). Questions should require children to consider how environmental change (the seasons, human activity, climate change) affects different organisms within their environment differently and therefore different habitats differently because all organisms in a habitat are independent.** | | Environment, flowering, non-flowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestations |
| **Common Misconceptions:** | **Some children may think:**   * The death of one of the parts of a food chain or web has no or limited consequences on the rest of the chain. * There is always plenty of food for wild animals. * Animals are only land-living creatures. * Animals and plants can adapt to their habitats, however they change. * All changes to habitats are negative. | | | |
| **Working scientifically opportunities:**  Revisit KS1 skills: focus on asking questions about the similarities and differences between things. Go outside to explore the world around them at all times of the year. | | | | |
| **Identifying and Classifying** | http://www.nottinghamanglers.co.uk/images/stories/lakes/oldmoor_pond.jpgPond dipping  Identify as many plants and min-beasts in the pond. Research how these might be related in a food chain.  **Oldmoor Pond, Strelley** | | |  |
| **Comparative testing** | How does the average temperature of the pond water change in each season? | | |
| **Fair tests** |  | | |
| **Pattern seeking** |  | | |
| **Research** | Research a food chain for a mini-beast in the local environment that is easy to find (woodlice and snails). Each group of children is allocated a small habitat, they monitor the plants and animals that live there over the course of the year and relate any population changes to the seasons and the change in populations of other organisms in the food chain. | | |
| **Ideas over time** | What effect does cutting down the rainforest have?  How did Jane Goodall learn about the habitats and behaviours of chimpanzees and why does she still need to work to protect their habitat? | | |
| **In Year 5:**   * Describe the difference in the life cycles of a mammal, an amphibian, an insect and a bird. * Describe the life process of reproduction in some plants and animals. | | | | |

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| **Animals including Humans** | | | | | | |
| **National curriculum objectives:**   * describe the simple functions of the basic parts of the digestive system in humans * identify the different types of teeth in humans and their simple functions * construct and interpret a variety of food chains, identifying producers, predators and prey   Pupils should be introduced to the main body parts associated with the digestive system, for example: mouth, tongue, teeth, oesophagus, stomach, and small and large intestine, and explore questions that help them to understand their special functions.  Pupils might work scientifically by: comparing the teeth of carnivores and herbivores and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images. | | | | | **Key ideas:**   1. Animals have teeth to help them eat. Different types of teeth do different jobs. 2. Food is broken down by the teeth and further in the stomach and intestines where nutrients go into the blood. The blood takes nutrients around the body. 3. Nutrients produced by plants move to primary consumers then to secondary consumers through food chains. | |
| **Prior Learning** | **Digestion: How the body gets nutrients into the blood.** | | | | | **Vocabulary** |
| **In Year 3:**  **Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food: they get their nutrition from what they eat.**  **Know how nutrients, water and oxygen are transported within animals and humans.**  **Know about the importance of nutritious, balanced diet.**  **Identify that humans and some other animals have skeletons and muscles for support, protection and movement: know about the skeletal and muscular system of a human.** | **Animals need variety of foods to help them grow and survive. The main food groups are:**  **Meat, dairy and pulses to provide protein for muscles.**  **Grains and root vegetables to provide carbohydrates for energy.**  **Fat for insulation and energy.**  **Fruit and vegetables for minerals, vitamins and fibre. These are essential to keep our bodies working well and protect us from illness.** | | **Different animals require different foods to survive. Humans require a balanced diet to remain healthy but healthy diets vary depending upon the type of activity that humans do.** | **The nutrients in food have to get to every part of the body. The blood transports them. The role of digestion is to get the nutrients in food to dissolve in the blood, if it doesn’t dissolve it can’t enter the blood and be transported.** | | Herbivore, carnivore, digestive system, tongue, mpouth, oesophagus, stomach, all bladder, small intestine, large intestine, liver, tooth, canine, incisor, molar, premolar, producer, consumer |
| **Common Misconceptions:** | **Some children may think:**   * Arrows in a food chain means ‘eats’. * The death of one of the parts of a food chain or web has no or limited consequences on the rest of the chain. * There is always plenty of food for wild animals. * Your stomach is where your belly button is. * Food is digested only in the stomach. * When you have a meal, your food goes down one tube and your drink goes down another. * The food you eat becomes ‘poo’ and the drink becomes ‘wee’. | | | | | |
| **Working scientifically opportunities:**  Revisit KS1 skills: focus on asking questions about the similarities and differences between things. Go outside to explore the world around them at all times of the year. | | | | | | |
| **Identifying and Classifying** | What are the names for all the organs involved in the digestive system? |  | | What jobs do our teeth do?  Children wash their hand and then feel their teeth: describe what they are like – look in a mirror and identify them.  They can then eat different foods (check allergies/dietary requirements) – Which teeth are doing what jobs? Create an hypothesis. | |  |
| **Comparative testing** | Are omnivores taller than vegetarians? |  | |  | |
| **Fair tests** |  |  | | What liquids make teeth rot? | |
| **Pattern seeking** |  | Are foods that are high in energy always high in sugar? | |  | |
| **Research** |  | Compare the diets of athletes with different demands e.g. cyclists and sprinters, marathon runners and weightlifters. How are they different and why? | |  | |
| **Ideas over time** | Children to keep a food diary for the day/ week and then check and tally up how much of each food group was in their diet. How does this compare with a healthy diet? | | | | |
| **In Year 5:**   * Know the life cycle of different living things, e.g. Mammal, amphibian, insect and bird. * Know the differences between different life cycles. * Know the process of reproduction in plants. * Know the process of reproduction in animals. | | | | | | |

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| **Sound** | | | | | | |
| **National curriculum objectives:**   * identify how sounds are made, associating some of them with something vibrating * recognise that vibrations from sounds 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   Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways.  Pupils might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume. | | | **Key ideas:**   1. Sound travels from its source in all directions and we hear it when it travels to our ears. 2. Sound travel can be blocked. 3. Sound spreads out as it travels. 4. Changing the shape, size and material of an object will change the sound it produces. 5. Sound is produced when an object vibrates. 6. Sound moves through all materials by making them vibrate. 7. Changing the way an object vibrates changes its sound. 8. Bigger vibrations produce louder sounds and smaller vibrations produce quieter sounds. 9. Faster vibrations (higher frequencies) produce higher pitched sounds. | | | |
| **Prior Learning** | **How sound is made, travels and can be changed.** | | | | | **Vocabulary** |
| **In KS1:**  **May have some understanding that objects make different sounds.**  **Some understanding that they use their ears to hear sounds.**  **Know about their different senses.** | Sounds can be made in many different ways and individual sounds have the properties of pitch and volume.  When a sound is made it immediately spreads out in all directions. As it travels its volume decreases but its pitch remains the same. | Sound is made when an object is made to vibrate (move backwards and forwards or up and down).  As the material vibrates it makes whatever it is in contact with vibrate, including air. As the air vibrates it makes whatever it is in contact with vibrate also, which might be a wall or even your eardrum. Sound moves through materials vibrating making other materials they are in contact with vibrate. | | | Pitch and volume are determined by how the material vibrates:   * Pitch is determined by how fast an object vibrates, ie. The frequency of vibration. The higher the frequency the higher the pitch. * Volume is determined by how big the movement of each vibration is (the amplitude of vibration). The bigger the amplitude the higher the volume.   Smaller objects and tighter strings and surfaces tend to vibrate with higher frequency. | Amplitude, volume, quiet, loud, ear, pitch, high, low, particles, instruments, wave |
| **Common Misconceptions:** | **Some children may think:**   * Pitch and volume are frequently confused, as both can be described as high or low. * Sound is only heard by the listener. * Sound only travels in one direction from the source. * Sound can’t travel through solids or liquids. * High sounds are loud and low sounds are quiet. | | | | | |
| **Working scientifically opportunities:**  Revisit KS1 skills: focus on asking questions about the similarities and differences between things. Go outside to explore the world around them at all times of the year. | | | | | | |
| **Identifying and Classifying** |  |  | | Identify what makes the sound using their knowledge of pitch and volume:  Blow up a balloon and put a 10p coin inside – swirl the balloon so the coin rolls around inside:  <https://www.youtube.com/watch?v=aAMW_3kWUhE> | |  |
| **Comparative testing** | If the volume of a sound decreases with distance what happens to it? If it spreads out, how could you prove it? |  | |  | |
| **Fair tests** |  | Soundproofing scenario:  How does the type of material affect how well it blocks sound?  How does the thickness of a material affect how well it blocks sound?  Which materials vibrate better and produce louder sounds? Can we identify any patterns?  Which materials make the best string telephone components? (Tin cans, plastic cups, paper cups; or for the cable wire, string or elastic). Make clear predictions. | |  | |
| **Pattern seeking** | Use a range of objects (water in bottles, elastic bands, rulers, tuning forks and tuning tubes). Children try and change the pitch of the notes and try and summarise what they have found. |  | |  | |
| **Research** |  |  | |  | |
| **Ideas over time** | Since the 1800s, how have scientists helped people who are deaf? | | | | |
| **In KS3:**   * **Frequencies of sound waves, measures in hertz (Hz); echoes, reflection and absorption of sound.** * **Sound needs a medium to travel, the speed of sound in air, in water, in solids.** * **Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal.** * **Auditory range of humans and animals.** | | | | | | |

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| **Electricity** | | | | | | |
| **National curriculum objectives:**   * 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 that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit * recognise some common conductors and insulators, and associate metals with being good conductors   Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6.  Note: pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with electricity. Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit. | | | | **Key ideas:**   1. A source of electricity (mains of battery) is needed for electrical devices to work. 2. Electricity sources push electricity round a circuit. 3. More batteries will push the electricity round the circuit faster. 4. Devices work harder when more electricity goes through them. 5. A complete circuit is needed for electricity to flow and devices to work. 6. Some materials allow electricity to flow easily and these are called conductors. Materials that don’t allow electricity to flow easily are called insulators. | | |
| **Prior Learning** | **Making electrical circuits** | | | | | **Vocabulary** |
| **In EYFS:**  **May have some understanding that objects need electricity to work.**  **May understand that a switch will turn something on or off.** | **Electrical power sources**  Lots of devices are powered by electricity; these need a source of electricity, which could be mains or battery. | **What batteries do**  The battery’s job is to push electricity to the device, but it needs something to carry the electricity all the way from the supply to the device, this is what we call a circuit. | **Making devices work harder**  If there are more batteries they push harder and so the device will work harder e.g. brighter or faster. | | **Insulators and conductors**  However not everything can carry the electricity from the source to the device, some materials allow the electricity through (conductors) and others don’t (insulators). | Electricity, electric, current, appliances, mains, crocodile clips, wires, bulb, battery, cell, battery holder, motor, buzzer, switch, conductor, electrical, insulator, conductor |
| **Common Misconceptions:** | **Some children may think:**   * Electricity flows to bulbs, not through them. * Electricity flows out of both ends of a battery. * Electricity works by simply coming out of one end of a battery into the component. | | | | | |
| **Working scientifically opportunities:**  Revisit KS1 skills: focus on asking questions about the similarities and differences between things. Go outside to explore the world around them at all times of the year. | | | | | | |
| **Identifying and Classifying** | How would you group these electrical devices based on where the electricity comes from?  How would you sort these objects/materials based on their temperature? |  |  | |  |  |
| **Comparative testing** |  |  |  | | Which metal is the best conductor?  Provide a mixture of junk materials for the children to compare outcomes. |
| **Fair tests** |  | What things effect the brightness of the light bulb? | | |  |
| **Pattern seeking** | Which room in a/your house has the most electrical sockets? |  |  | |  |
| **Research** | How has electricity changed the way we live? |  |  | |  |
| **Ideas over time** | Who actually invented the light bulb, Thomas Edison or Joseph Swan? | | | | |
| **In Year 6:**   * 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 switches. * Use recognised symbols when representing a simple circuit in a diagram. | | | | | | |

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| **Solids, Liquids and Gases** | | | | | | |
| **National curriculum objectives:**   * Compare and group materials together, according to whether they are solids, liquids or gases * 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) * identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.   Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.  Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting. | | | | | **Key ideas:**   1. Solids, liquids and gases are described by observable properties. 2. Materials can be divided into solids, liquids and gases. 3. Heating causes solids to melt into liquids and liquids evaporate into gases. 4. Cooling causes gases to condense into liquids and liquids to freeze into solids. 5. The temperature at which given substances change state are always the same. 6. When two or more substances are mixed and remain present the mixture can be separated. 7. Some changes can be reversed and some can’t. | |
| **Prior Learning** |  | | | | | **Vocabulary** |
| **In KS1:**  **-**Distinguish between an object and the material from which it is made.  -Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.  -Describe the simple physical properties of a variety of everyday materials.  -Compare and group together a variety of everyday materials on the basis of their simple physical properties.  -identify and compare the sustainability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.  - Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. | **Properties of solids, liquids and gases.**  Materials can be divided into solids, liquids and gases.  -**Solids**: hold their shape unless forced to change.  -**Liquids**: flow easily but stay in their container because of gravity. The move viscous a liquid the less runny it is.  -**Gases**: move everywhere and are not held in containers by gravity. | **Changing state.**  Heating causes solids to melt into liquids and liquids evaporate to gases.  Cooling causes gases to condense to liquids and liquids freeze to solids. | **Melting, freezing, boiling and condensation temperatures.**  Different substance change state at different temperatures but the temperatures at which given substances change state are always the same. | **What happens at the melting temperature?**  The temperature at which a substance melts from a solid to a liquid is the same at which it freezes from a liquid to a solid.  The temperature at which a substance boils from a liquids to a gas is the same at which it condenses from gas to liquid.  Liquids evaporate slowly, even below their boiling temperature. | **Dissolving and separating mixtures**  A mixture = more than one substance present in a container.  When a substance is added to a liquid and it disappears – completely dissolves them the mixture becomes a solution.  All mixtures can be separated if they have a difference of property, because all the materials are still present. | Solid, liquid, gas, materials, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection |
| **Common Misconceptions:** | **Some children may think:**  ‘solid’ is another word for hard or opaque  • solids are hard and cannot break or change shape easily and are often in one piece  • substances made of very small particles like sugar or sand cannot be solids  • particles in liquids are further apart than in solids and they take up more space  • when air is pumped into balloons, they become lighter  • water in different forms – steam, water, ice – are all different substances  • all liquids boil at the same temperature as water (100 degrees)  • melting, as a change of state, is the same as dissolving  • steam is visible water vapour (only the condensing water droplets can be seen)  • clouds are made of water vapour or steam  • the substance on windows etc. is condensation rather than water  • the changing states of water (illustrated by the water cycle) are irreversible  • evaporating or boiling water makes it vanish  • evaporation is when the Sun sucks up the water, or when water is absorbed into a surface/material. | | | | | |
| **Working scientifically opportunities:**  Revisit KS1 skills: focus on asking questions about the similarities and differences between things. Go outside to explore the world around them at all times of the year. | | | | | | |
| **Identifying and Classifying** | Give children a variety of materials – ask them to classify them as solids, liquids and gases |  |  | Which of the following dissolve in water: sugar, bicarbonate of soda, oil, chocolate, coffee, dark vinegar and wax? | |  |
| **Comparative testing** | How does the amount of water added to flour affect its state?  Best water slide ever!  How does the amount of detergent added to water affect how slippy it is? |  |  | What is the melting temperature of ice and how does it compare with the freezing temperature of water? | |
| **Fair tests** | Dancing raisins:  Place a small handful of raisins into lemonade. Children explore the reason behind why they react the way they do? Get chn to think about variables could they put in to extend. | Demonstrate the water cycle  Melt ice, heat water to let it evaporate, showing the steam condense on a cold surface and letting it run off and drip like rain back to the original container.  Ask the children to predict what will happen and why before this is demonstrated. | Chocolate smugglers:  Children try to smuggle chocolate into class by putting it in their pockets – but it always ends as a squidgy liquid mess. What chocolate would be best to smuggle? How does the type of chocolate affect its melting temperature? | Use different techniques (taught separately first) allowing the children to then choose which would be most appropriate to separate mixtures:   |  |  | | --- | --- | | Separating technique | Difference in property required | | Filtration and sieving | A solid that doesn’t dissolve in a liquid.  Different sized solid bits. | | Magnets | Some materials magnetic others not | | Evaporation | A solid dissolved in water and the solid has a high boiling temperature | | Floating | Some materials float and others sink. |   -plastic covered steel wire from strands of string and plastic.  -separate out the bits of wood from stones and sand in soil.  -get pure salt and sand from a salty sandy mixture. | |
| **Pattern seeking** | Spray perfume or water (disguised from the chn) at one end of the room, children raise their hands when they can smell it. They then draw diagrams of their choice to show what happened to the smell (gas) and explain the pattern of its movement. |  |  |  | |
| **Research** | What are hurricanes and why do they happen? | | | | |
| **Ideas over time** | How have scientists’ tests for predicting the weather, changed over time? | | | | |
| **In Year 5:**   * compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets * know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution * use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating * give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic * demonstrate that dissolving, mixing and changes of state are reversible changes * explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. | | | | | | |