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**Long Term Mapping**

**Science**

**KS4**

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|  | | **KS4** | **KS4** |
| **Cycle 1 (2022 – 2023)** | **Cycle (2023-2024)** |
| **Autumn** | **1** | Biology - *Living things and their habitats* Biodiversity, Classification & Care of Environments | Chemistry - *Material Properties and Material Changes* States of Matter |
| **2** | Biology - *Living things and their habitats* Biodiversity, Classification & Care of environments | Physics - Seasonal Changes |
| **Spring** | **1** | Physics - *Sound* | Biology - *Animals Including Humans* Digestion |
| **2** | Physics - Sound | Biology - *Animals Including Humans* Teeth and Food Chains |
| **Summer** | **1** | Physics - Seasonal Changes | Physics - *Electricity* |
| **2** | Chemistry - *Material Properties and Material Changes* States of Matter | Physics - *Electricity* |

**Medium Term Planning**

**Key Stage 4**

**Cycle 1 (2022 – 2023)**

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| ***Aspiration for Life*** | | | *Differentiated, aspirational targets dependent on pupil needs.* | | ***Language for Life*** | *Explicit teaching/ exposure to new scientific vocabulary* | ***Learning for Life*** | *Opportunities to develop cross curricular skills e.g. maths, English and ICT* |
| **KS4 Cycle 1 (2022-2023)** | INTENT; To explore the world around us, observe phenomena, develop scientific vocabulary, be curious and ask questions about what we see, answer scientific questions creatively and form conclusions from our evidence gathered. | **Living things and their habitats Biodiversity, Classification & Care of environments** | | **Living things and their habitats Biodiversity, Classification & Care of environments** | **Sound** | **Sound** | **Seasonal Changes** | **Material Properties and Material Changes States of Matter** |
| **Autumn 1 –** 7 weeks | | **Autumn 2 -** 7 weeks | **Spring 1 –** 6 weeks | **Spring 2 –** 6 weeks | **Summer 1 –** 5 weeks | **Summer 2 –** 7 weeks |
| Pupil can recognise that living things can be grouped in a variety of ways.  Pupil can recognise environments can change and that this can sometimes pose danger to living things. | | Pupil can explore and use classification keys to group, identify and name a variety of living things in their local and wider environment.  Pupil can recognise that environments can change and, that this can sometimes pose danger to living things. | Pupil identifies how sounds are made, associating some of them with something vibrating and recognises that vibrations from sounds travel through a medium to the ear. | Pupil can experiment with sound and shows some understanding of how sound is made and transmitted. | Pupil can name the four seasons and identify when in the year they occur.  Pupil can observe changes across the four seasons.  Pupil can observe weather associated with the seasons.  Pupil can describe the weather associated with the seasons.  Pupil knows that day length varies. | Pupil can group materials according to whether they are solids, liquids or gases.  Pupil can compare solids, liquids or gases. |
| **SUGGESTED PRACTICALS** *(Choose from or use suitable alternative)* | | | | | | |
| Group invertebrates and vertebrates  Group animal kingdom (Mammal, plant, reptile, amphibian and bird)  Use hoops to group animals by features (has legs, no legs, has scales etc…)  Group invertebrates into snails and slugs, worms, spiders, and insects.  Pupil can investigate changes in the outdoor environment throughout the year eg collate photos taken each month from the same window and discuss how the scene changes.  Using classification keys to classify organisms from pictures.  Create your own classification key  Cross - curricular links with geography  VISIT: Manchester Museum  SMSC: Use of imagination and creativity in their learning | | Group plants into flowering and non-flowering plants  Pupil can Investigate changes in the outdoor environment throughout the year e.g. collate photos taken each month from the same window and discuss how the scene changes.  Local habitat survey – observing, recording and gather evidence  Visit a park  Videos on deforestation  Cross - curricular links with geography  SMSC: Understanding of consequences of behaviour and actions | Pupil can explore how sounds are made using different objects such as sauce pan lids, elastic bands of different thickness  Create a string telephone  Investigate the best material for absorbing sound  Pupil can explore and identify the way sound is made in a range of different musical instruments.  Cross - curricular links with music  Music shop  Visit from Manchester University Dental Students  SMSC: Listening to sounds and music from different religious and ethnic backgrounds | Investigating pitch on different instruments  Does sound travel fastest through solids or liquids?  Drum, tuning fork to represent vibrations of sound  Using popping candy to emphasise sound in water. – Which liquids does the popping candy pop in the loudest?  Making breakfast and listening to rice crispy crack.  Cross - curricular links with music  SMSC: Listening to sounds and music from different religious and ethnic backgrounds / participate in and respond to cultural musical opportunities | (W/S) By making tables and charts about the weather: and making displays of what happens in the world around them, including day length, as the seasons change.  Weather Diary – Report (measure temperature, rainfall and wind direction)  Summer walk  Find the indicators of summer  Record changes in day length over a period of time  What clothes do we wear this season  Match weather to season  Visit your tree and record what it looks like  Observe changes across the 4 seasons  Cross Curricular – Art  VISIT: Park  SMSC: Recognise and value the things we share in common (cultural, ethnic, socio economic communities) | Boiling water in a kettle  Making ice cubes  Watching ice cubes melt  Identify the bubbles of gas  /materials in a fizzy drink  Melting chocolate investigation  Cross - curricular links with Geography  VISIT: Magna  SMSC: Willingness to reflect on their experiences / sense of enjoyment and fascination in learning about the world around them |
| **SKILLS (*to be developed)*** | | | | | | |
|  | **Asking Questions and Planning an Enquiry**  Asking questions and using different types of scientific enquiries to answer them  **Record**  Gather, record, classify and present data in a variety of ways to help in answering questions.  Record findings using simple scientific language, drawing, labelled diagrams, keys, bar charts and tables | | **Asking Questions and Planning an Enquiry**  Asking questions and using different types of scientific enquiries to answer them  **Record**  Gather, record, classify and present data in a variety of ways to help in answering questions.  Record findings using simple scientific language, drawing, labelled diagrams, keys, bar charts and tables | Explore  **Asking Questions and Planning an Enquiry**  Asking questions and using different types of scientific enquiries to answer them | **Asking Questions and Planning an Enquiry**  Asking questions and using different types of scientific enquiries to answer them  Using keys, bar charts and tables | **Observe and Describe**  **Recording**  Gather and record data to help in answering questions | **Setting up an enquiry**  Set up simple practical enquiries comparative and fair tests  Setting up a fair test  **Record**  Gather, record, classify and present data in a variety of ways to help in answering questions.  Record findings using simple scientific language, drawing, labelled diagrams, keys, bar charts and tables |
| **VOCABULARY** *(In addition to ‘skills’ terms listed above)* | | | | | | |
| Classification, classification keys, environment and habitat | | human impact, positive, negative, migrate and hibernate | Sound, faint, loud and insulation | Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud and insulation | Leaf, flower, blossom, petal, fruit, Weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn) and sun | Solid, liquid, gas, state change, melting, freezing, melting point, boiling point and evaporation |
|  | | | | | | |
| Ongoing – recognise that environments can change  **Week 1 -6** Explore ways grouping living things  **Week 7** Assessment | | Ongoing – recognise that environments can change  **Week 1-2** Explore ways of grouping flowering and non-flowering plants  **Week 3-4** Make use of a simple key to identify local plants and animals in a chosen habitat  **Week 5-7** Describe what effects humans can have on their environment | Ongoing – recognise that environments can change  **Week 1 -2** Explore how sounds are made using different objects  **Week 3-4** Explore making ear muffs made from different materials and how they can provide insulations from sound  **Week 5** Explore how sound travels using electrical resources (ear phones) and non-electrical resources (string and cups)  **Week 6:** Assessment | Ongoing – recognise that environments can change  **Week 1 -2** Define pitch and investigate pitch on different instruments.  **Week 3-4** Define sound and investigate how volume is affected by vibrations  **Week 5-6** Recognises that sounds gets fainter as the distance from the sound source increases | Ongoing – recognise that environments can change  **Week 1** Name and describe seasons in order - Begin weather and changes in day length diary. Compare trees in different seasons and visit their favourite spot by a tree  **Week 2** Summer Walk – find and name 3 or more wild flowers, 3 trees or more trees. Draw and describe your flowers and trees  **Week 3** Match weather vocabulary to season  **Week 4 -**Look at sun safety What clothes we wear in summer? Why? Longest day of the year and when the clocks go backwards and forwards  **Week 5 Assessment** | Ongoing – recognise that environments can change  **Week 1-2** Define solid, liquid and gas and group items accordingly.  **Week 3** Observe ice melting, freezing and turning to steam.  **Week 4**  Plan an investigation to find the effect of temperature on chocolate  **Week 5** Plan an investigation to find the effect of temperature on chocolate  **Week 6** Carry out the investigation to find the effect of temperature and chocolate  **Week 7** Write results and form a conclusion for the effect of temperature on chocolate |

**Medium Term Planning**

**Key Stage 4**

**Cycle 2 (2023 – 2024)**

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| ***Aspiration for Life*** | | | *Differentiated, aspirational targets dependent on pupil needs.* | | ***Language for Life*** | *Explicit teaching/ exposure to new scientific vocabulary* | ***Learning for Life*** | *Opportunities to develop cross curricular skills e.g. maths, English and ICT* |
| **KS4 Cycle 2 (2023 -2024)** | INTENT; To explore the world around us, observe phenomena, develop scientific vocabulary, be curious and ask questions about what we see, answer scientific questions creatively and form conclusions from our evidence gathered. | **Material Properties and Material Changes (States of Matter)** | | **Seasonal Changes** | **Animals Including Humans (Digestion)** | **Animals Including Humans (Teeth and Food Chains)** | **Electricity** | **Electricity** |
| **Autumn 1 –** 7 weeks | | **Autumn 2 -** 7 weeks | **Spring 1 –** 6 weeks | **Spring 2 –** 6 weeks | **Summer 1 –** 5 weeks | **Summer 2 –** 7 weeks |
| Pupil can observe that some materials change state when they are heated or cooled and measure/research the temperature at which this happens in degrees Celsius.  Pupil understands that liquids evaporate and condense as a result of temperature. | | Pupil can name the four seasons and identify when in the year they occur.  Pupil can observe changes across the four seasons.  Pupil can observe weather associated with the seasons.  Pupil can describe the weather associated with the seasons.  Pupil knows that day length varies e.g. the length of sunlight per day (24hours) varies through the year. | Pupil can describe the simple functions of the basic parts of the digestive system in humans. | Pupil can identify the different types of teeth in humans and their simple functions.  Pupil can construct and interpret a variety of food chains identifying producers, predators and prey. | Pupil can identify common appliances that run on electricity. | Pupil can construct a simple series electrical circuit identifying and naming its basic parts.  Pupil knows that changes can be made to circuits and that some materials are better conductors than others. |
| **SUGGESTED PRACTICALS** *(Choose from or use suitable alternative)* | | | | | | |
| **Ice Cube Investigation**  Boil a kettle – Get steam over mirror  Place two or three ice cubes on some cling film stretched over a container of warm water.  Put two ice cubes in two beakers. Put a teaspoon of salt on one ice cube, and observe what happens over a few minutes. Use a thermometer to observe how the temperature in the beakers changes.  Cross - curricular links with geography  SMSC: Willingness to reflect on their experiences / sense of enjoyment and fascination in learning about the world around them | | (W/S) Investigate what happens to the total length of daylight this term and write a report  Weather Diary – Report (measure temperature, rainfall and wind direction)  Autumn walk: Find the indicators of autumn  Record changes in day length over a period of time (sunrise and sunset)  What clothes do we wear this season, why?  Match weather to season  Visit a tree and record what it looks like in autumn  Cross Curricular – Art  VISITS: Local park, Astronomy Centre, Todmordon  SMSC: Recognise and value the things we share in common (cultural, ethnic, socio economic communities) | Look at which key parts of the digestive system we already know and define the ones we are unfamiliar with  Label diagram of digestive system  Demonstrate how different parts of the digestive system work using a model Use chopping board and knife for mouth, tube for oesophagus, plastic tubs for stomach, small intestine, large intestine (all with pictures of what each tub represents on the front) and tights.  Draw digestive system  Give household objects and ask to discuss which object could be used to model the different parts of the digestive system – turn into a video  Cross - curricular links with PSHE  Visit from Manchester University Dental Students  SMSC: Interest in investigating and offering reasoned views and moral and ethical issues and appreciate viewpoint of others | (W/S) Effect of fizzy drinks on teeth experiment  (W/S) Brush the brown layers of the left eggs with toothpaste to show how toothpaste works – which toothpaste works best? Fluoride or non-fluoride?  Practising flossing using large lego.  Practise brushing teeth using yogurt containers.  Paint using toothbrushes – emphasise different directions to scrub your teeth - improving fine motor skills  What would life be like without teeth? – Does a baby need teeth- it just needs food to be broken down before!  Pupil can construct and interpret a variety of food chains identifying producers, predators and prey.  SMSC: Interest in investigating and offering reasoned views and moral and ethical issues and appreciate viewpoint of others | Investigate the effect of adding more batteries  Define battery and compare the effectiveness of new and old batteries  Cross - curricular links with geography – (thunder/lightening)  VISIT: Electronic Shop  SMSC: Recognise and value the things we share in common (cultural, ethnic, socio economic communities) | Investigate complete and incomplete circuits  Make circuits and draw them pictorially  N.B. Children in pathway 4 do not need to use standard symbols as this is taught in year 6  Cross - curricular links with geography – (thunder/lightening)  SMSC: Recognise and value the things we share in common (cultural, ethnic, socio economic communities) |
| **SKILLS (*to be developed)*** | | | | | | |
| Setting up an enquiry  Set up simple practical enquiries comparative and fair tests  Setting up a fair test | | **Observe and Describe**  **Recording**  Gather and record data to help in answering questions | **Record**  Record findings using simple scientific language, drawing, labelled diagrams | Record  Gather, record, classify and present data in a variety of ways to help in answering questions.  Record findings using simple scientific language, drawing, labelled diagrams, keys, bar charts and tables | Comparing  **Interpret and Report**  Report on findings from enquires, including oral and written explanations, displays or presentations of results and conclusions | Asking Questions and Planning an Enquiry  Asking questions and using different types of scientific enquiries to answer them |
| **VOCABULARY** *(In addition to ‘skills’ terms listed above)* | | | | | | |
| Solid, liquid, gas, state change, melting, freezing, melting point, boiling point and evaporation | | Leaf, flower, blossom, petal, fruit, Weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn) and sun, axis, tilts, Earth, Sun, planets, rotates, solstice, equinox and orbits, hemisphere | Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus and teeth | Teeth, incisor, canine, molar, premolars,  herbivore, carnivore, omnivore, producer, predator, prey and food chain | Battery and electricity | Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal and symbol |
|  | | | | | | |
| **Week 1-2** Define solid liquid and gas and group items accordingly.  **Week 3-4** Describe changes in state  **Week 5-6** Ice cube investigation  **Week 7:** Assessment | | **Week 1** Name and describe seasons in order - Begin weather and changes in day length diary  **Week 2** Compare trees in different seasons and visit their favourite spot by a tree  **Week 3** Autumn Walk – Describe weather associated with autumn  **Week 4** Match weather/vocabulary to season  **Week 5** What clothes do we wear at different points in the year?  **Week 6-7** Longest day of the year When the clocks go backwards and forwards | **Week 1-2** Know the main parts of the digestive system  **Week 3-4** Pupils understand the function of the mouth the tongue and the teeth  **Week 5** Pupil understands the functions of the large intestine and the anus and can order parts of the human digestive system  **Week 6 Assessment** | **Week 1** Define function of teeth, identify canine, molars and incisors and describe their function  **Week 2** Compare carnivore and herbivore teeth  **Week 3** Pupils know what damages teeth and how to look after them  **Week 4** Construct and interpret food chains and identify the producer, prey and predator  **Week 5-6**  Can identify simple adaptations for animals | **Week 1-2** Know that electricity can be dangerous and have been taught precautions for working safely  **Week 2-3** Define battery and compare the effectiveness of new and old batteries  **Week 4** Investigate the effect of adding more batteries  **Week 5** Assessment | **Week 1-2** Pupil knows key vocabulary- cells (battery), wires, bulbs, switches and buzzers**.**  **Week 3** Investigate complete and incomplete circuits.  **Week 4** Make circuits and draw them pictorially.  **Week 5** Define series circuit and find out whether a lamp will light in it (based on whether the lamp is part of the loop with a battery).  **Week 6 -7** Recognises some common conductors and insulators and know that metals are good conductors. |