



All the work we do contributes towards our “Golden Threads” and our stated aim that *reasoning* is at the heart of all we do. Wherever appropriate, we deploy the TASC wheel to engage the children in their learning.

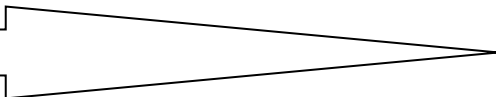
Curriculum File Organisation- STEM Champions

Statement of Intent and Key Principles	Science – 1. Hypothesise / Predict /Test (experiment) / Evaluate / Communicate 2. Know subject specific facts Engineer – Deploy principles of TASC Computing / programming – use Crumble from y2 (programmable toys in phase 1)
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Review Cycle

Prior to the teaching of STEM		During the planned teaching period		Post teaching	
Action	outcome	Action	outcome	Action	outcome
<ul style="list-style-type: none"> Curriculum docs – are these centrally collected and stored? Materials- ordered by teachers from class budgets Trips planned- via the office. CPD need- highlighted through phase leader discussion. 		<ul style="list-style-type: none"> Book scrutiny Pupil discussion Drop in observations Peer teaching Teacher talks Trip(s) feedback. 		<ul style="list-style-type: none"> Feedback on cycle Lessons learnt and changes for next time. 	

Subject Specific Terminology.

Phase 1	Phase 2	Phase 3
<div style="border: 1px solid black; padding: 5px; display: inline-block;">Please refer back to previous phase if children are not secure – aim high if they are.</div> 		
<p>Content Knowledge (coverage)</p>		
<p>Content – year 1 Pets (Dog Show) Reception</p> <p><u>1</u> <u>4</u> <u>5</u></p> <p><u>Year 1</u></p> <p><u>1</u> Plants, animals and humans – identifying different types of trees and parts of trees. Seasonal changes – Autumn. Starting to explore materials – making traps for Superworm to trap Wizard Lizard</p> <p><u>4</u> Animals – Rainforest V Antarctica, comparing habitats and animals. Life cycle of a penguin. Tracking seasonal change – Winter. Exploring freezing/melting. Identifying herbivores/carnivores</p> <p><u>5</u> Tracking seasonal changes – Winter-Spring. Identifying and exploring materials to make an ‘alien’ planet for a Beebot.</p> <p><u>Plants, animals and humans.</u></p> <ul style="list-style-type: none"> identify and name a variety of common wild and garden plants, including deciduous and evergreen 	<p>Content - year 2 blue text year 3 green text</p> <p><u>1 Plants, animals and humans Materials</u> Dinosaurs (y2)</p> <p>3. Plants, animals and humans: Lions and the African Savannah.</p> <p>4. Stem: Robot and the Bluebird making the robot a beating and flashing heart using crumble.</p> <p>6. Materials making outfits for Flowery Festival</p> <p><u>1 Electricity / Forces</u> (y3) magnets / circuits</p> <p><u>4 Plant and Animal adventures</u> (y3) – plants / food for animals / seeds & bulbs / nutrition / skeletons</p> <p><u>5 Light</u> (y3) shadows / reflections / light diagrams link with D&T work</p> <p><u>Plants, animals and humans.</u></p> <ul style="list-style-type: none"> explore and compare the differences between things that are living, dead, and things that have never been alive 	<p>Content Yr 4 –blue text yr5 green text y6 black text</p> <p><u>4 Plants, Animals and Humans</u> (y4) Teeth / digestion / food chains</p> <p><u>5 Sound (y4)</u> -</p> <p><u>1 Materials</u> – change of state / solids, liquids, gas / water cycle</p> <p><u>5 Earth in Space and Light</u> (y5)</p> <p><u>4 Plants, Animals and Humans</u> (y5) life cycles / pond dipping / incubate eggs / butterfly / plant reproduction / seed dispersal / pollination / importance of pollinators</p> <p><u>1 Materials</u> – chemical change / mixtures / “slime” “bouncy balls”(y5)</p> <p><u>4 Plants, Animals and Humans</u> (y6) –Dissections / puberty / health/ adaptation and inheritance</p> <p><u>5 Forces</u> -Rocket Cars (y6)</p> <p><u>1 Electricity</u> – Crumble projects+(y4, y5, y6)</p> <p><u>Plants, animals and humans.</u></p> <ul style="list-style-type: none"> describe the simple functions of the basic parts of the digestive system in humans identify the different types of teeth in humans and

trees

- identify and describe the basic structure of a variety of common flowering plants, including trees.
- identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
- identify and name a variety of common animals that are carnivores, herbivores and omnivores
- describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)
- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

Materials

- 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.

Seasons

- observe changes across the four seasons
- observe and describe weather associated with the seasons and how

- 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 microhabitats
- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- 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
- investigate the way in which water is transported within plants
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.
- observe and describe how seeds and bulbs grow into mature plants
- find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.
- notice that animals, including humans, have offspring which grow into adults
- find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- describe the importance for humans of

their simple functions

- construct and interpret a variety of food chains, identifying producers, predators and prey.
- describe the differences 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.
- describe the changes as humans develop to old age.
- identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- describe the ways in which nutrients and water are transported within animals, including humans.
- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Materials

- 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.
- compare and group together everyday materials

day length varies.

exercise, eating the right amounts of different types of food, and hygiene

- 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
- identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Materials

- identify and compare the suitability 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.
- compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- describe in simple terms how fossils are formed when things that have lived are trapped within rock
- recognise that soils are made from rocks and organic matter

Light

- recognise that they need light in order to see things and that dark is the absence of light
- notice that light is reflected from surfaces
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes

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.

Electricity

- 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.
- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit

- 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.

Forces

- compare how things move on different surfaces
- notice that some forces need contact between two objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having two poles
- predict whether two magnets will attract or repel each other, depending on which poles are facing.

- compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- use recognised symbols when representing a simple circuit in a diagram.

Earth in Space

- describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- describe the movement of the Moon relative to the Earth
- describe the Sun, Earth and Moon as approximately spherical bodies
- use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Forces

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Sound and Light

- 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.

		<ul style="list-style-type: none"> • recognise that light appears to travel in straight lines • use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
	<p><u>Procedural Knowledge (skills)</u></p>	
<p><u>Planning</u> Can they think of some questions to ask? Can they talk about what they <see, touch, smell, hear or taste>?</p> <p><u>Doing</u> Can they perform a simple test? Can they use simple equipment to help them make observations?</p> <p><u>Evaluating</u> Can they identify and classify things they observe? Can they tell other people about what they have done •Can they answer some scientific questions? •Can they give a simple reason for their answers? •Can they explain what they have found out? Can they show their work using pictures, labels and captions? •Can they record their findings using standard units? •Can they put some information in a chart or table?</p>	<p><u>Planning</u> •Can they use different ideas and suggest how to find something out? •Can they make and record a prediction before testing? •Can they plan a fair test and explain why it was fair? •Can they set up a simple fair test to make comparisons? •Can they explain why they need to collect information to answer a question? •Can they record and present what they have found using scientific language, drawings, labelled diagrams, bar charts and tables?</p> <p><u>Doing</u> Can they measure using different equipment and units of measure? •Can they record their observations in different ways? <labelled diagrams, charts etc> •Can they describe what they have found using scientific language? •Can they make accurate measurements using standard units? •Can they explain their findings in different ways (display, presentation, writing)? •Can they use their findings to draw a simple conclusion? •Can they suggest improvements and predictions for further tests?</p>	<p><u>Planning</u> Can they explore different ways to test an idea, choose the best way, and give reasons? •Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this? •Can they plan and carry out an investigation by controlling variables fairly and accurately? •Can they make a prediction with reasons? •Can they use information to help make a prediction? •Can they use test results to make further predictions and set up further comparative tests? •Can they explain, in simple terms, a scientific idea and what evidence supports it?</p> <p><u>Doing</u> Can they explain why they have chosen specific equipment? (incl ICT based equipment) •Can they decide which units of measurement they need to use? •Can they explain why a measurement needs to be repeated? •Can they record their measurements in different ways? (incl bar charts, tables and line graphs) •Can they take measurements using a range of scientific equipment with increasing accuracy and precision</p> <p><u>Evaluating</u> Can they find a pattern from their data and explain what it shows? •Can they use a graph to answer scientific questions? •Can they link what they have found out to other science? •Can they suggest how to improve their work and say why they think this?</p>

	<p><u>Evaluating</u> Can they explain what they have found out and use their measurements to say whether it helps to answer their question? •Can they use a range of equipment (including a data-logger) in a simple test? •Can they suggest how to improve their work if they did it again?</p>	<p>•Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models? •Can they report findings from investigations through written explanations and conclusions? •Can they report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations?</p>
<p><u>Enquiry</u></p> <ul style="list-style-type: none"> • Observation over time (E.g. Seasons) • Classification & identification (E.g. every day objects) • Fair test • Pattern seeking to draw conclusions (E.g. materials, seasons and what happens etc.) 	<p><u>Enquiry</u></p> <ul style="list-style-type: none"> • Observation over time (E.g. life cycle of a flower) • Classification & identification (E.g. magnetic/not magnetic) • Fair test • Pattern seeking to draw conclusions (E.g. shadows from different objects) • Secondary sources - famous Scientists and their research - how has it helped us? 	<p><u>Enquiry</u></p> <ul style="list-style-type: none"> • Observation over time (E.g. water evaporating, ice melting etc.) • Classification & identification (E.g. objects are solid/liquid/gas) • Fair test (E.g. Temperature effect on water evaporation) • Pattern seeking to draw conclusions (E.g. the harder the clap, the louder the sound/ reproduction and genetics) • Secondary sources - famous Scientists and their research - how has it helped us?