Chaddlewood Primary School's Science Progression Grid

Topics/WS Working scientifically	Year 5	Year 6
Animals including humans	Describe the changes as humans develop to old age RSE human life cycle to old age **Vocab: Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty**	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Children identify and name the main organs of the human body, and describe their functions. These include: Heart pumps blood around the body Lungs absorb oxygen and expel CO2 Brain controls the nervous system Liver cleans waste Kidneys clean the blood Stomach/intestines churn up food, digest it and its absorbed into the blood Children can identify the parts of the circulatory system. Children complete diagrams showing parts of the system and explain the function of heart, lungs and blood vessels. Children understand the function of blood in the body. Children write an explanation about how and why blood is transported around the body along with some key information about blood. recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function To be able to assess the impact of drugs and alcohol on the human body by labelling the effect of smoking and drinking on different organs To recognise the lifestyle choices that people can make and the effect that these have on the human body and its functions by creating an advisory letter to Year 5 children describe the ways in which nutrients and water are transported within animals, including humans. To understand how the circulatory system is linked with the digestive system. Children work in small groups to make notes and use these to

		create a poster about how water and nutrients travel through the body. **Vocab: Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Deoxygenated, Valve, Exercise, Respiration**
Light		recognise that light appears to travel in straight lines To be able to draw a labelled diagram showing how objects are seen. 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 To use knowledge of how light travels to be able to construct a periscope to see something above a table when sitting beneath it 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 To describe using scientific vocabulary how we see, using terminology such as light source, reflect, wave use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them To be able to explain how shadows are created and why their size changes in relation to the light source. Children create shadow puppets and experiment with altering the size of the shadow. **Vocab: translucent, transparent and opaque, reflection and refraction, filter, wavelength, incident, absorbed, prism, spectrum**
Forces and magnets	explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Gravity lesson. Let go of a ball, why does it fall to the floor? Watch videos, look at Sir Isaac Newton- how did he discover gravity? Look at gravity on the moon- why do people look like they are skipping? Measure forces using Newtons- investigation identify the effects of air resistance, water resistance and friction, that act between moving surfaces A lesson is given to look at each of these forces. Air resistance- paper spinners. Water resistance- measuring objects in air and in water using a Newton Meter. Friction- Ramps with 4 different surfaces, how steep must the ramp be before the toy starts to slide down the ramp.	

	recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect (used to do this at Plympton Academy as they had the equipment but stopped this as it wasn't well done). Jigsaw activity. In groups of 3 chn go to one of the tables and research that mechanism, then report back to the rest of the group. **Vocab: Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys**	
Living things and their habitats	describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Draw each life cycle with full description of what happens at each stage Visit pond for life cycle of a frog Compare life cycles of insect and amphibian by looking at complete and incomplete metamorphosis. describe the life process of reproduction in some plants and animals Asexual and sexual reproduction in plants (progression from year 2 is that we discuss asexual and sexual reporduction) Take cuttings from a plant and try to clone plant. Asexual and sexual reproduction in mammals and insects - dragonfly RSE human reproduction - body parts and menstruation **Vocab: Mammal, Reproduction, Insect, Amphibian, Bird, Offspring**	describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals Children can describe who Carl Linnaeus was; explain how living things (plants, micro-organisms and animals) are classified using the Linnaean system and can classify living things using the Linnaean system. Children can use branching diagrams to identify differences between plants and animals give reasons for classifying plants and animals based on specific characteristics Children can identify different types of animals; match the types of animals to their characteristics; design a creature that has a set of characteristics of one type of animal; classify creatures based on their characteristics. **Vocab: Classification, Vertebrates, Invertebrates, Micro-organisms, Amphibians, Reptiles, Mammals, Insects**
States of matter	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 Feely bags to generate vocabulary from chn about properties which leads to application of why materials are used or not used for particular tasks such as a chocolate teapot. Chn investigate thermal conductors by designing a new lunchbox. know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Chn carry out an experiment to show dissolving and how some solids will dissolve and others are insoluble.	

	Chn look at evaporation to show that some solids can be recovered: sugar solution. use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Alien soup. Chn are given a mixture which they will need to decide the best way to separate it to discover what is in it. In the previous lesson we discuss the methods of separation- sieving, filtering, evaporation, which will help them when completing the Alien soup task. Chn photograph each step and write captions. give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Investigate thermal insulators and conductors. Design a new lunch box. Chn need to come up with a fair test to see which material is the best to keep their lunch cool. Demonstrate that dissolving, mixing and changes of state are reversible changes Chn practically carry out these three methods. Discuss reversible changes and what makes them reversible. 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 Burning materials lesson to demonstrate that burning is an irreversible change. Chemical reactions lesson- Chn observe/carry out 4 reactions and draw diagrams of what they see happening. Effervescent tablet and water (exploding pots), Bicarbonate of soda and vinegar (inflating the balloon), warm milk and vinegar (casein plastic) mentos and coke (is this a chemical reaction- no as no new product is formed, can chn spot this?) **Vocab: Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing**	
Electricity		associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit To carry out an investigation to assess how varying the number of cells affects different components 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

		To carry out an investigation to assess whether wire length affects the brightness of a bulb To design and use a range of switches to serve different functions use recognised symbols when representing a simple circuit in a diagram. To associate circuit diagram symbols with components To draw circuit diagrams that include different components **Vocab: Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators, Amps, Volts, Cell**
Earth and Space	describe the movement of the Earth and other planets relative to the sun in the solar system Chn create a fruit solar system to model movement of Earth and the other planets in relation to the sun. Chn create an information poster based on the above describe the movement of the moon relative to the Earth Roleplay of Moon and Earth relative movement Waxing and waning of the moon Label the season according to phase of the moon describe the sun, Earth and moon as approximately spherical bodies Chn use evidence cards to look at historical evidence to support the fact that the moon, sun and Earth are spherical. use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky Look at shadows to explain how day and night are explained both Earth's rotation and how the sun appears to move across the sky. **Vocab: Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation**	
Evolution and inheritance		recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Children use ICT to summarise in their own words how evolution and natural selection have led to changes over time Children examine fossils and pictures of fossils to make inferences about the habitat and characteristics of the source animals recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents

		Chn look at genes/chromosomes and cells and the idea that DNA makes us who we are is in each cell. Progress to inheritance and variation and adaptation. Children to sort cards (under the subheadings of inherited and acquired characteristics). identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. To be able to link adaptation to an animal's habitat. Explain the scientific version of adaptation. Look at accidental adaptations like mutations in DNA. Children to identify the adaptations that a human would need to have to survive certain habitats. **Vocab: Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics**
WS	tests planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Design a new lunch box How can we speed up dissolving? Compare the effects of gravity in air and in water. taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Measuring gravity using Newton Meters, reading thermometers to test thermal insulators, stopwatch for air resistance- repeat 3 times and take an average, using stop watches to record the time taken for sugar to dissolve, rulers to measure the height of the ramps (friction). recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Bar graphs- forces, scientific diagrams and results tables drawn when writing up investigations. using test results to make predictions to set up further comparative and fair Factors that affect the speed of dissolving, chn create these based on a previous science experiment. reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations Chn write up conclusions for each investigation. Feedback results to the class and discuss results.	Through practical science methods, processes and skills should be developed aligned to the study content focusing upon: Planning enquiries, including recognising and controlling variables where necessary Children will investigate the effect of wire length on the brightness of a bulb Children will investigate how varying the number of cells in a circuit affects the operation of components Children investigate how moving the relative distances between a light source, an object and a screen affects the size of a shadow Taking measurements, using a range of scientific equipment, with increasing accuracy and precision Children use measuring equipment to complete the investigations outlined above Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs and models Children complete classification keys to group and distinguish between animals, plants and micr-organisms Children record data to record how the height of a shadow varies Children label parts of the human body to identify the effect of lifestyle choices on major organs Reporting findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions and consider patterns

	identifying scientific evidence that has been used to support or refute ideas or arguments All scientific investigations carried out produce evidence which either prove or disprove their predictions.	In carrying out investigations, children will make predictions, describe their method, give details of control, dependent and independent variables, present their results and draw conclusions Presenting findings in written form, displays and other presentations Children will write up investigations Children will summarise their understanding using challenge grids Children will produce posters, letters and other written outcomes to present scientific information Using test results to make predictions to set up further comparative and fair tests Children will make predictions before carrying out investigations, review their results against predictions and make conjectures about their findings Using simple models to describe scientific ideas Children will construct a model of the heart and circulatory system Children will create a model of the human digestive system Identifying scientific evidence that has been used to support or refute ideas or arguments Children will assess the evidence for scientific ideas such as evolution Children will identify the evidence that informs healthy lifestyle choices