End of Year Framework

Subject: Science

Repton Manor Primary School

National Curriculum Aims:

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Science Key Concepts

	YR	Y1	Y2	Y3	Y4	Y5	Y6
Creativity							
Questioning							
Hypothesis							
Predicting							
Exploring Variables							
Developing Experiments							
Analysing and Presenting Data							
Drawing Conclusions							
Adaptations and Forward Thinking							

Methodology:

Kent Science Scheme

	Knowledge	Skills	Key Vocabulary:
EYFS	• I am beginning to understand the effect my behaviour can have on the environment. • I show care and concern for living things and the environment. • I know some similarities and differences between the natural world around me and contrasting environments. • I understand processes and changes in the natural world - seasons and changes in states and matter.	**Hypothesis:** • I comment and ask questions about aspects of my familiar world, such as the place where I live or the natural world. **Experiments/Recording Data:** • I can explore the natural world - making close observations and drawing pictures of animals and plants. **Conclusions:** • I can talk about why things happen and how things work.	natural, man-made, similar, different, environment, season, solid, liquid, gas.
Year 1	**Seasonal Changes:** • I can observe changes across the four seasons. • I can observe and describe weather associated with the seasons and how day length varies. **Everyday Materials:** • I can distinguish between an object and the material from which it is made. • I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • I can describe the simple physical properties of a variety of everyday materials. • I can compare and group together a variety of everyday materials on the basis of their simple physical properties. **Animals, Including Humans:** • I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. • I can identify and name a variety of common animals that are carnivores, herbivores and omnivores. • I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). • I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. **Plants:** • I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. • I can identify and describe the basic structure of a variety of common flowering plants, including trees.	**Hypothesis:** • I ask simple questions and make simple predictions based on what I know. **Experiments:** • I can gather and record data to help in answering questions. • I can observe closely, using simple equipment. • I can perform simple tests. **Recording Data:** • I can orally explain observations made during experiments. **Conclusions:** • I can use observations and ideas to begin to suggest answers to questions.	wild, deciduous, evergreen, stem, flower, leaf, petal, roots. fish, amphibian, reptile, bird, mammal, carnivore, herbivore, omnivore, touch, taste, sight, smell, hear, senses, head, arm, leg, torso, fingers, toes, knees, neck, elbow. material, object, wood, plastic, glass, metal, water, rock, properties, season, Spring, Summer, Autumn, Winter, day, week, month, year.

Year 2	**Animals, including Humans:** ● I notice that animals, including humans, have offspring which grow into adults. ● I can find out about, and describe, the basic needs of animals, including humans, for survival (water, food and air). ● I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **Living things and their habitats:** ● I can explore and compare the differences between things that are living, dead, and things that have never been alive. ● I can 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. ● I can identify and name a variety of plants and animals in their habitats, including microhabitats. ● I can 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. **Uses of Everyday Materials:** ● I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. ● I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. **Plants:** ● I can observe and describe how seeds and bulbs grow into mature plants. ● I can find out, and describe, how plants need water, light and a suitable temperature to grow and stay healthy.	**Hypothesis:** ● I can ask questions about what they notice and recognise that they can be answered in different ways. ● I can make predictions and begin to explain why I have made them. **Experiments/Recording Data:** ● I can use different types of scientific enquiry to gather and record data, using simple equipment where appropriate, to answer questions. ● I can observe closely, using simple equipment. ● I can perform simple tests. ● I can begin to identify and classify based on basic criteria. **Conclusions:** ● I can use observations and ideas to suggest answers to questions.	living, dead, habitat, micro-habitat, food chain, food source. Seeds, bulb, water, light, temperature, growth. animal, human, offspring, adult, survival, water, food, air, shelter, hygiene, diet, health, exercise. suitability, material, wood, metal, plastic, glass, brick, rock, paper, cardboard, squashing, bending, twisting, stretching.
Year 3	**Animals, including Humans:** ● I can 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. ● I can identify that humans and some other animals have skeletons and muscles for support, protection and movement. **Forces and Magnets:** ● I can compare how things move on different surfaces. ● I notice that some forces need contact between two objects, but magnetic forces can act at a distance.	**Hypothesis:** ● I ask relevant questions and use different types of scientific enquiries to answer them. ● I can make predictions based on evidence already gathered. **Experiments:** ● I can set up simple practical enquiries, comparative and fair tests. **Recording Data:**	roots, stem, trunk, leaves, flowers, air, water, nutrients, room, water transportation, pollination, seed formation, seed dispersal, nutrition, skeleton, muscle, support, protection, movement. rock, property, fossils, fossilised, soils, organic, igneous, metamorphic, sedimentary. light, dark, reflection, sun, protection, shadow, opaque. forces, magnets, attract, repel, pole, north, south,

	• I can observe how magnets attract or repel each other and attract some materials and not others. • I can 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. • I describe magnets as having two poles. • I can predict whether two magnets will attract or repel each other, depending on which poles are facing. **Light:** • I recognise that I need light in order to see things and that dark is the absence of light. • I notice that light is reflected from surfaces. • I recognise that light from the sun can be dangerous and that there are ways to protect my eyes. • I recognise that shadows are formed when the light from a light source is blocked by an opaque object. • I can find patterns in the way that the size of shadows change. **Plants:** • I can identify and describe the functions of different parts of plants; roots, stem, leaves and flowers. • I can 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. • I can investigate the way in which water is transported within plants. • I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Rocks:** • I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • I describe in simple terms how fossils are formed when things that have lived are trapped within rock. • I recognise that soils are made from rocks and organic matter.	• I can gather, record, classify and present data in a variety of ways to help in answering questions. **Conclusions:** • I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • I can identify differences, similarities or changes related to simple scientific ideas and processes. • I can use straightforward scientific evidence to answer questions or to support my findings.	
Year 4	**Animals Including Humans:** • I can describe the simple functions of the basic parts of the digestive system in humans. • I can identify the different types of teeth in humans and their simple functions.	**Hypothesis:** • I can ask relevant questions and use different types of scientific enquiries to answer them. **Experiments:**	grouped, classification, environment, vertebrate, invertebrate, ecological, digestive system, mouth, oesophagus, stomach, small intestine, large intestine, anus, teeth, molars, premolars, incisors, canine, wisdom tooth, food chain, predator, prey, producer.

	• I construct and interpret a variety of food chains, identifying producers, predators and prey. **Electricity:** • I can identify common appliances that run on electricity. • I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • I can 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. • I recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • I recognise some common conductors and insulators, and associate metals with being good conductors. **Living things and their habitats:** • I recognise that living things can be grouped in a variety of ways. • I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • I recognise that environments can change and that this can sometimes pose dangers to living things. **Sound:** • I can identify how sounds are made, associating some of them with something vibrating. • I recognise that vibrations from sounds travel through a medium to the ear. • I can find patterns between the pitch of a sound and features of the object that produced it. • I can find patterns between the volume of a sound and the strength of the vibrations that produced it. • I recognise that sounds get fainter as the distance from the sound source increases. **States of Matter:** • I can compare and group materials together, according to whether they are solids, liquids or gases. • I can 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).	• I can set up simple practical enquiries, comparative and fair tests. • I can make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. **Recording Data:** • I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. **Conclusions:** • I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	Solid, liquid, gas, state, evaporation, condensation, water cycle, temperature. Sound, vibration, ear, eardrum, ear canal, pitch, pattern, volume, strength. Electricity, circuit, cells, wires, bulbs, switch, buzzer, lamp, complete, conductor, insulator.

	• I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		
Year 5	**Living things and their habitats:** • I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • I can describe the life process of reproduction in some plants and animals. **Animals, including humans:** • I can describe the changes as humans develop to old age. **Properties and changes of materials:** • I can 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. • I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. • I use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. • I demonstrate that dissolving, mixing and changes of state are reversible changes. • I can 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. **Earth and Space:** • I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • I can describe the movement of the Moon relative to the Earth. • I can describe the Sun, Earth and Moon as approximately spherical bodies. • I use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. **Forces:**	**Hypothesis:** • I use test results to make predictions to set up further comparative and fair tests. **Experiments:** • I can plan different types of enquiry to answer questions based on what I would like to find out. • I can take measurements, using a range of scientific equipment, with increasing accuracy and precision. • I can identify independent, dependent and control variables for an experiment. **Recording Data:** • I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs. **Conclusions:** • I can report and present findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations. • I can identify scientific evidence that has been used to support or refute ideas or arguments.	Life cycle, baby, toddler, teenager, adult, elder, metamorphosis, reproduction, sexual reproduction, asexual reproduction. hardness, solubility, transparency, conductivity, magnetism, solution, substance, filter, sieve, evaporate, dissolving, reversible, irreversible, Earth, planet, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, moon, sun, orbit, spherical, rotation, day, night. Force, gravity, water resistance, upthrust, air resistance, friction, push, pull, mechanism, lever, gear, pulley,

	• I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces. • I recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.		
Year 6	**Animals, including Humans:** • I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. • I recognise the impact of diet, exercise, drugs and lifestyle on the way my body functions. • I can describe the ways in which nutrients and water are transported within animals, including humans. **Electricity:** • I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • I can 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. • I use recognised symbols when representing a simple circuit in a diagram. **Evolution and Inheritance:** • I recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. • I recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. • I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. **Light:** • I recognise that light appears to travel in straight lines. • I 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. • I can 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.	**Hypothesis:** • I can evaluate prior knowledge and learning to build and develop hypotheses. **Experiments:** • I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. **Recording Data:** • I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs and bar and line graphs. **Conclusions:** • I can 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. • I can identify scientific evidence that has been used to support or refute ideas or arguments.	Classifying, characteristics, subdivisions, Blood, heart, arteries, veins, capillaries, ventricle, aorta, atrium, auricle, pulmonary, blood vessels. Fossils, evolution, inheritance, offspring, genes, DNA, natural selection, characteristics, selective breeding. Light, eye, cornea, pupil, iris, lens, Voltage, cells, components, series circuits.

	● I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **Living things and their habitats:** ● I can describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. ● I can give reasons for classifying plants and animals based on specific characteristics.		