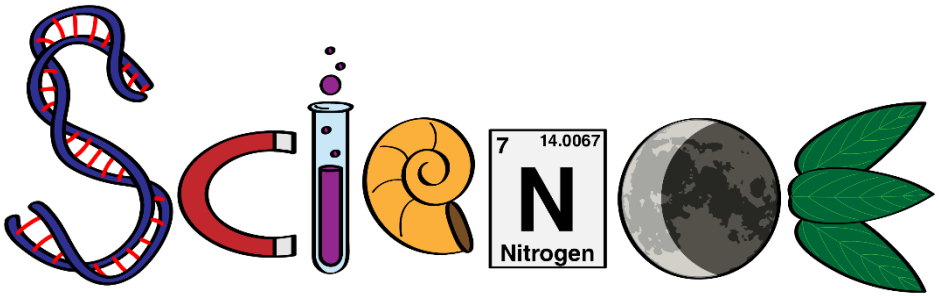

BECOMING A SCIENTIST

Essential Characteristics:

• The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.

• Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations.

• Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.

• High levels of originality, imagination or innovation in the application of skills.

• The ability to undertake practical work in a variety of contexts, including fieldwork.

• A passion for science and its application in past, present and future technologies.

Subject Leaders Skills and Concepts Layering Plan for Science 2019

Throughout the science curriculum for LKS2, the following **working scientifically** key milestones will be implemented within each science topic:

- Ask relevant questions.
- Set up simple, practical enquiries and comparative and fair tests.
- Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers.
- Gather, record, classify and present data in a variety of ways to help in answering questions.
- Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables.
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests.
- Identify differences, similarities or changes related to simple, scientific ideas and processes.
- Use straightforward, scientific evidence to answer questions or to support their findings.

Key stage Two	National Curriculum Coverage	Keys Milestones	Key activities
Year A Topics			
We will rock you!	Fossils and Rocks	• Compare and group together different kinds of rocks on the basis of their simple, physical properties. • Relate the simple physical properties of some rocks to their formation (igneous or sedimentary). • Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. • Recognise that soils are made from rocks and organic matter	Create a fossil – coffee/sand/clay mixture. Fossil study – observations of rocks. Children to bring in any if they have some.

Light it up	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. • Recognise that shadows are formed when the light from a light source is blocked by a solid object. • Find patterns in the way that the size of shadows changes.	Silhouette artwork using pupil shadows Test materials to block light – design new black out blinds for class – which materials would work best? Shadow work on playground
	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.	Simple circuit designs – draw and label Create circuits with switch/buzzer/bulb. Which materials conduct electricity to complete a circuit? Test
	Habitats (coastal)	• Recognise that environments can change and that this can sometimes pose dangers to specific habitats.	
We are Inspirational	Living things and habitats Plants	• Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys. • Identify and describe the functions of different parts of flowering plants: roots, stem, 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.	Food colour experiment in flowers – observe coloured water travelling through flowers/celery. Observe coloured water travelling through kitchen roll from one pot to the next. Flower dissection – label relevant parts. Create own paper flowers.

		• Investigate the way in which water is transported within plants. • Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Grow cress/beans in various conditions: light, dark, cold -observe results.
Year B Topics			
Burps, Bottoms Bile	Animals, including humans	• Identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat. • Construct and interpret a variety of food chains, identifying producers, predators and prey. • Identify that humans and some animals have skeletons and muscles for support, protection and movement.	Design food chains for animals they research Create a moving skeletal hand – art straws and string. Comapre skeletal structures of animals: exo/indo skeletons
	Digestion	• 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.	Teeth disclosure tablets – observing teeth and oral health Create a "working" digestive system – tights, bags and food.
Super Science	Sound	• Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear.	Manchester university for children website – how the ear works Testing vibrations – rice/sand on a drum. Tuning forks in water
	Forces and magnets	• 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.	Friction experiments – testing different surfaces

		• Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. • 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 magne, 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.	Magnetic separation: different materials mixed together and separated with magnets. Which are/aren/t attracted to magnets? Iron filing faces – create pictures with iron filings and magnets. Use iron filings to demonstrate magnetic field and the act or repel/attract.
	Solids, liquids, gases (States of Matter)	• 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 the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics. • • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	