YEAR 4 SCIENCE

Working Scientifically

Pupils will be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them
- making systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment e.g thermometers and data loggers
- gathering , recording, classifying and presenting data in a variety of ways to help answer questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identity differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer question or to support their findings

LIVING THINGS AND THEIR HABITATS

Working Scientifically Assessment Task – Troublesome Animals

Key Vocabulary

characteristics, classification / keys, endangered, environment, excretion, extinct, habitat, hibernate, invertebrates, life processes, migrate, nutrition, organisms, reproduction, respiration, sensitivity, vertebrates

Key Skills	Knowledge
Obtaining and presenting evidence:	**National Curriculum Requirements** ➢ recognise that living things can be grouped in a variety of ways

➢ gather and record data in a variety of ways **Considering and evaluating evidence:** ➢ use straightforward scientific evidence to answer questions or to support their findings	➢ explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment ➢ recognise that environments can change and that this can sometimes pose dangers to living things **Lesson Breakdown:** **Grouping Living Things** ➢ recognise that living things can be grouped in a variety of ways by sorting living things into a range of groups. ➢ gather, record, classify and present data in a variety of ways to help in answering questions by using a range of methods to sort and group living things **Classifying Vertebrates** ➢ explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment by generating questions to sort vertebrates in a classification key ➢ identify differences, similarities or changes related to simple scientific ideas and processes by identifying vertebrates by their similarities and differences **Classifying Invertebrates** ➢ use keys to identify invertebrates in their local environment **Classification Keys** ➢ create classification keys and tables showing the characteristics of living things

	Local Habitat Survey ➢ recognise that environments can change and that this can sometimes pose dangers to living things by identifying changes and dangers in the local habitat ➢ record observations on a map and in a table **Environmental Changes** ➢ recognise that environments can change and that this can sometimes pose dangers to living things by learning about environmental dangers and endangered species ➢ report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions by writing about and orally presenting findings from research
ANIMALS (including humans) **Working Scientifically Assessment Task - Teeth**	
Key Vocabulary anus, canine, carnivore, digestion, digestive system, food chain, herbivore, incisor, molar, mouth, nutrients, oesophagus, omnivore, predator, prey, producer, rectum, saliva, small / large intestine, stomach, teeth	
Key Skills	**Knowledge**
Planning: ➢ set up simple practical enquiries, comparative and fair tests	**National Curriculum Requirements** ➢ 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

Obtaining and presenting evidence: ➢ make systematic and careful observations ➢ record and present findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables ➢ report on findings **Considering and evaluating evidence:** ➢ identify differences, similarities or changes related to simple scientific ideas and processes ➢ with help, use results to draw conclusions ➢ use straightforward scientific evidence to answer questions or support their findings ➢ with support, raise further questions	➢ construct and interpret a variety of food chains, identifying producers, predators and prey **Lesson Breakdown:** **Tooth Decay** ➢ identify the different types of teeth in humans and their simple functions ➢ discuss how to keep teeth healthy; plan and set up an investigation into tooth decay **Types of Teeth** ➢ draw conclusions from an investigation about keeping teeth healthy and to identify and examine different types of teeth **Parts of the Digestive System** ➢ describe the simple functions of the basic parts of the digestive system in humans ➢ identify the parts of the digestive system and their function **The Digestion Process** ➢ demonstrate and explain the process of digestion **Food Chains** ➢ construct and interpret a variety of food chains, identifying producers, predators and prey ➢ gather, record, classify and present data in a variety of ways to help in answering questions

	➢ construct food chains for different habitats and explain findings using the correct scientific language **Animal Teeth** ➢ identify omnivores, carnivores and herbivores by their teeth ➢ compare similarities and differences between the teeth of different animals ➢ link what is observed about an animal's teeth with where they are in the food chain

STATES OF MATTER

Working Scientifically Assessment Task - Solids, Liquids and Gases

Key Vocabulary

boiling point, condensation, evaporation, gas, freezing, liquid, melting, melting point, precipitation, solid, state change, temperature, water cycle, water vapour

Key Skills	Knowledge
Planning: ➢ ask relevant questions and use different types of scientific enquiries to answer them **Obtaining and presenting evidence:** ➢ make systematic and careful observations	**National Curriculum Requirements** ➢ 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 ➢ identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature **Lesson Breakdown:**

➢ take accurate measurements using standard units, using a range of equipment ➢ gather and record data in a variety of ways ➢ report on findings **Considering and evaluating evidence:** ➢ identify differences, similarities or changes related to simple scientific ideas and processes ➢ with help, use results to draw conclusions ➢ use straightforward scientific evidence to answer questions or support their findings	**Solid, Liquid or Gas?** ➢ compare and group materials together, according to whether they are solids, liquids or gases **Investigating Gases** ➢ compare and group materials together, according to whether they are solids, liquids or gases by investigating gases and their uses **Heating and Cooling** ➢ 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) by investigating how heating and cooling can change a material's state **Wonderful Water** ➢ 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) by exploring how water can change its state to a solid, liquid or a gas **Evaporation Investigation** ➢ associate the rate of evaporation with temperature by investigating the effect of temperature on drying washing **The Water Cycle** ➢ identify the part played by evaporation and condensation in the water cycle by creating a model of the water cycle

SOUND

Working Scientifically Assessment Task - Changing Pitch

Key Vocabulary

amplitude, distance, ear, eardrum, faint, insulation, particles, pitch, sound, sound proof, sound wave, source, travel, vacuum, vibrate, vibration, volume

Key Skills	Knowledge
Planning: ➢ ask relevant questions and use different types of scientific enquiries to answer them ➢ set up simple practical enquiries, comparative and fair tests **Obtaining and presenting evidence:** ➢ make systematic and careful observations **Considering and evaluating evidence:** ➢ with help, use results to draw conclusions	**National Curriculum Requirements** ➢ 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 gets fainter as the distance from the sound source increases **Lesson Breakdown:** **Good Vibrations** ➢ identify how sounds are made, associating some of them with something vibrating **Hearing Sounds** ➢ identify how sounds are made, associating some of them with something vibrating

➢ with support, raise further questions	➢ find patterns between the volume of a sound and the strength of the vibrations that produced it ➢ recognise that vibrations from sounds travel through a medium to the ear **Higher and Lower** ➢ recognise that vibrations from sounds travel through a medium to the ear, by exploring how high and low sounds are created ➢ find patterns between the pitch of a sound and features of the object that produced it, by exploring and creating musical instruments, and explaining how they change pitch **String Telephone** ➢ recognise that sounds get fainter as the distance from the sound source increases, by exploring how sounds change over distance ➢ recognise that vibrations from sounds travel through a medium to the ear, by making string telephones **Soundproofing** ➢ recognise that vibrations from sounds travel through a medium to the ear, by investigating the best material for absorbing sound **Making Music** ➢ recognise that vibrations from sounds travel through a medium to the ear, by making a musical instrument and explaining how it works ➢ find patterns between the pitch of a sound and features of the object that produced it, by making a musical instrument and explaining how it works

ELECTRICITY

Working Scientifically Assessment Task – Identifying Conductors (designed to be run near beginning of topic)

Key Vocabulary

battery, bulb, buzzer, cell, complete circuit, component, conductor, connections, crocodile clip, electrical appliance / device, electricity, generate, insulator, mains, metal, motor, negative, non-metal, non-renewable, plug, positive, renewable, short circuit, switch, symbol

Key Skills	Knowledge
Planning: ➢ set up simple practical enquiries, comparative and fair tests **Obtaining and presenting evidence:** ➢ make systematic and careful observations ➢ gather and record data in a variety of ways ➢ report on findings **Considering and evaluating evidence:** ➢ with help, use results to draw conclusions	**National Curriculum Requirements** ➢ 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 **Lesson Breakdown:** **Appliances** ➢ identify common appliances that run on electricity **Making Circuits** ➢ construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers

➢ with support, raise further questions	**Complete Circuits** ➢ 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 **Conductors and Insulators** ➢ recognise some common conductors and insulators, and associate metals with being good conductors **Switches** ➢ recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit **Electrical Discussions** ➢ discuss and solve problems about electricity using reasoning skills