Tywardreath School

Science Overview
Key Knowledge, Skills and Vocabulary
Year B

What makes Tywardreath Curriculum unique? A clear focus on local, national and global communities, raising multi-cultural awareness, highlighting aspirational role models, developing skills for life, promoting a respect for our environment, celebrating responsible citizens and providing opportunities to debate and reflect.

	Year 1 and 2	Year 3 and 4	Year 5 and 6
Autumn 1	Explorers Through Time	Who You Gonna Call?	A Child's War
	Animals Including Humans (Y2) Importance of Exercise	Electricity (Y4)	Properties and Changes in Materials (Y5) Solids, liquids, gases, reversible changes
National Curriculum Objectives	Pupils should be taught to: -describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	Pupils should be taught to: -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	Pupils should be taught to: -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 -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
Assessment	**TAPS:** Ask Questions and Plan Enquiry (heart rate)	**TAPS:** Ask Questions and Plan Enquiry (conductors)	**TAPS:** Ask Questions and Plan Enquiry (dissolving/sugar cubes)
Working Scientifically	Pupils should be taught to: --ask simple questions and recognise that they can be answered in different ways	Pupils should be taught to: -ask relevant questions and use different types of scientific enquiries to answer them set up simple practical enquiries, comparative and fair tests	Pupils should be taught to: -Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
Key Knowledge	-Know that we are humans and that we have basic needs to survive. -Discuss our own opinion and needs and how that may differ to others.	-Know how to identify electrical and nonelectrical appliances. -Explain, with support, how a circuit works.	-Explain the uses of thermal and electrical conductors and insulators. -Order materials according to their electrical conductivity.

	-Know what it means to be healthy. -Know about different types of food and how they impact our weight and health. -Know the importance of hygiene and begin to take responsibility for own hygiene. -Know the importance of exercise and it impact on our physical and mental health.	-Able to name at least two electrical conductors and insulators. -Able to create a simple series circuit both with and without a switch - Know that Alessandro Volta an Italian scientist created the first battery. - Know that we rate batteries in volts in honour of Volta.	-Explain and investigate dissolving. -Explain the processes used to separate mixtures. -Explain irreversible changes. - Know about Professor Brian Cox's work and watch him showing- real world sewage filtration
Sequence of Learning	Can I explain basic human needs? Can I describe a healthy diet? Can I explain the importance of hygiene on our health? Can I explain the importance of physical exercise on our physical and mental health?	Can I name a range of common electrical appliances? Can I construct a simple electrical circuit and name all the parts? Can I discover when a bulb will light in a simple circuit? Can I explain the purpose of switches? Can I describe a selection of materials as conductors or insulators?	Recap from Y1/2 (Everyday Materials) Can I explain the uses of thermal and electrical conductors and insulators? Can I order materials according to their electrical conductivity? Can I explain and investigate dissolving? Can I explain the processes used to separate mixtures? Can I explain irreversible changes?
Key Vocabulary	Diet, dehydrate, disease, energy, exercise, germs, heart rate, hygiene, nutrition, pulse	Appliances, electricity, electrical circuit, cell, wire, bulb, buzzer, danger, electrical safety, sign, insulators, wood, rubber, plastic, glass, conductors, metal, water, switch, open, closed	Properties, hardness, solubility, transparency, electrical conductor, thermal conductor, response to magnets, dissolve, solution, separate, separating, solids, evaporation, filtering, sieving, melting, irreversible, burning, chemists, insulation

	Year 1 and 2	Year 3 and 4	Year 5 and 6
Autumn 2	Where is our Kingdom?	Where Can We Go?	Is There Anybody Out There?
	Animals Including Humans Classification(1) and offspring (2)	**Plants (Y3)** Function of different parts + requirements to grow	**Earth and Space (Y5)**
National Curriculum Objectives	Pupils should be taught to: -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 -notice that animals, including humans, have offspring which grow into adults	Pupils should be taught to: -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	Pupils should be taught to: -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
Assessment	**TAPS:** Set Up Enquiry (Animal Classification)	**TAPS:** Set Up Enquiry (function of stem)	**TAPS:** Set Up Enquiry (craters)
Working Scientifically	Pupils should be taught to: Perform simple tests	Pupils should be taught to: -set up simple practical enquiries, comparative and fair tests	Pupils should be taught to: -use test results to make predictions to set up further comparative and fair tests
Key Knowledge	-Know that animals can be grouped and classified. -Begin to group and classify local animals. -Name animals which lives in our local environment and why. -Know the differences and similarities between carnivores, herbivores and omnivores and make links to local animals. -Know that animal have offspring and match appropriately. -Know that Carolus Linnaeus was the first person to introduce a system for naming and grouping animals	-Know the functions of different parts of flowering plants -Know what plants require for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant - Know that scientists are working to develop new crops that can grow in today's changing climate -more resistant to extreme weathers -know about the work of Joanne Chory	-Know that the Sun, Earth and Moon as spherical. -Name the planets in the solar system independently. -Distinguish between heliocentric and geocentric ideas of planetary movement. -Explain that day and night is due to rotation of the Earth. -Support the idea that different places on Earth experience night and day at different times with evidence. -Explain how the Moon moves relative to the Earth -Know about the achievements of Tim Peake
Sequence of Learning	Can I describe how animals can be grouped and classified? Can I begin to group and classify local animals?	Can I name the functions of different parts of flowering plants? Can I describe what plants require for life and growth (air, light, water, nutrients from soil, and	Can I explore the idea of spherical bodies? Can I name and describe features of the planets in our solar system?

	Can I name animals which lives in our local environment and why? Can I explain the differences and similarities between carnivores, herbivores and omnivores and make links to local animals? Can I match offspring to parent animal?	room to grow) and how they vary from plant to plant Can I research how scientists are working to develop new crops that can grow in today's changing climate? Can I explain why this research is necessary?	Can I explain how planets move in our solar system? Can I explore night and day? Can I describe the movement of the earth in relation to the sun? Can I describe the movement of the moon relative to the Earth?
Key Vocabulary	fish, amphibians, reptiles, birds and mammals, carnivores, herbivores and omnivores, offspring	Roots, flowering plants, stem, trunk, leaves, flower, air, light, water, nutrients from the soil, room to grow, little fertiliser	Sun, star, moon, planet, sphere, spherical bodies, satellite, orbit, rotate, axis, geocentric model, heliocentric model, astronomer,

	Year 1 and 2	Year 3 and 4	Year 5 and 6
Spring 1	Traps, Trams and Trains	Davy Shines the Light!	Ancient Egyptians – Original Farmers?
	Everyday Materials (Y2) Identify and Compare Materials	**Light (Y3)**	**Light (Y6)**
National Curriculum Objectives	Pupils should be taught to: -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	Pupils should be taught to: -recognise that they need light in order to see things and that the 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	Pupils should be taught to: -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
Assessment	**TAPS:** Observe and Measure (Reflection tests)	**TAPS:** Observe and Measure (making shadows)	**TAPS:** Observe and Measure (Investigating shadows)
Working Scientifically	Pupils should be taught to: -Observe closely, using simple equipment	Pupils should be taught to: -Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	Pupils should be taught to: -take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Key Knowledge	-Identify and name everyday materials in our classroom and school grounds -Describe simple properties of everyday materials. -Distinguish between an object and the material it is made from -Identify and name materials used to make transport and give reasons for usage -Begin to know which materials are most suitable for different modes of transport	-Identify light sources -Understand that we need light to see -Know what light travels in a straight line -Identify reflective surfaces -Know that the Sun can damage their eyes -Know how to protect their eyes from the Sun -Understand that a shadow is formed when a solid object blocks light -Identify some parts of the eye -Know how shadows change size Know that glasses have been used for over 2000years by the Inuits and then in the 12th century in China	-Know that light travels in straight lines. -Describe and explain how light enables us to see. -Understand reflection as light bouncing off a surface. -Identify some effects of refraction and know that it is light bending or changing direction -Identify the visible spectrum. -Explore colours using light and know that colours are a result of light reflecting off an object -Know that Isaac Newton discovered information about light and colour Know that Ibn-al Haytham

		In 1929 Sam Foster began mass production of sunglasses to darken vision. -Know that the discovery of ultra violet light led to the development of sunglasses in 1936 by Edwin Land polaroid filters to protect against harmful rays	(965-1040) was the first scientist to find out that light travels in straight lines and from this discovered how our eyes work.
Sequence of Learning	Can I name different materials? Can I say what material an object is made from? Can I describe the properties of everyday materials? Can I say what materials transport is made from and why? Can I say what materials are reflective?	Can I explain how light is needed to see? Can I understand how light travels? Can I explain why light from the sun is dangerous? Can I explain how sunglasses have developed? Can I make careful observation?	Recap learning from Y3/4 Light Can I explain how light travels? Can I explore the angles of incidence and reflection? Can I explore the visible spectrum? Can I investigate how light enables us to see colours? Can I explore shadows?
Key Vocabulary	Object, material, hard, soft, stretchy, shiny, dull, rough, smooth, bendy, waterproof, not waterproof, absorbent, not absorbent, transparent, opaque	Light, light source, dark, reflection, reflect, reflective, ray, pupil, retina, shadow, opaque, translucent, transparent	Light, light source, reflection, incident ray, reflected ray, the law of reflection, refraction, visible spectrum, prism, shadow, transparent, translucent, opaque

	Year 1 and 2	Year 3 and 4	Year 5 and 6
Spring 2	A Land Down Under!	How Mighty are Mountains?	Who Lives in Rio?
	Plants (Y2) Growth and Needs	**Animals including Humans (Y3)** Skeletons and muscles for protection, support, movement	Electricity (Y6)
National Curriculum Objectives	Pupils should be taught to: -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	Pupils should be taught to: -identify that humans and some other animals have skeletons and muscles for support, protection and movement	Pupils should be taught to: - associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit - 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.
Assessment	**TAPS:** Record (compare growth)	**TAPS:** Record (skeletons)	**TAPS:** Record (bulb brightness)
Working Scientifically	Pupils should be taught to: -Gather and record data to help in answering questions	Pupils should be taught to: -Gather, record and classify and present data in a variety of ways to help in answering questions -Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables	Pupils should be taught to: -record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Key Knowledge	-Explain that plants need water, light and a suitable temperature to grow well. -Follow instructions to plant a seed and a bulb. -Order and describe the life cycle of a plant. -Suggest how to care for a plant so it grows well. -Name and identify common wild plants growing in Australia and make comparisons to the UK plants. -Name the basic structure of plants and make comparisons between the UK and Australian plants using what we know about its climate etc.	-Know that not all animals have an internal skeleton and that the presence of this is important in classifying them. -Know that a skeleton is needed for support, protection and movement. -Know that muscles work in pairs to allow movement and posture	Recap learning Y3/4 Electricity -Explain how our understanding of electricity has changed over time -Know the main circuit symbols and use these to draw circuit diagrams - Draw circuit diagrams using the correct symbols and label the voltage correctly -Explain the effect of increasing or decreasing the voltage on different parts of a circuit

Sequence of Learning	Can I follow instructions to plant a seed/bulb? Can I suggest what a plant needs to grow well? Can I label the basic structure of plants? Can I name and identify some Australian Plants? Can I name and identify some UK plant Can I compare the structure of UK and Australian plants? Can I order the lifecycle of a plant?	Recap learning from Year 1 / 2 Can I sort foods into food groups and find out about the nutrients that different foods provide? Can I explore the nutritional values of different foods by gathering information from food labels? Can I investigate an idea about how the human skeleton supports movement? Can I explain how bones and muscles work together to create movement?	Can I explain how our understanding of electricity has changed over time? Can I identify the main circuit symbols and use these to draw circuit diagrams? Can I draw circuit diagrams using the correct symbols and label the voltage correctly Can I explain the effect of increasing or decreasing the voltage on different parts of a circuit?
Key Vocabulary	Sunlight, water, temperature, nutrition, germination, sprout, shoot, seed dispersal, Plants, growth , (names of common plants in UK and Australia) Flower, leaf, stem, root, food, Oxygen, Carbon dioxide	Herbivore, carnivore, omnivore, nutrition, diet, food chain, data, table, bar chart, vertebrate, invertebrate, bone, skeleton, skull, ribcage, pelvis, femur, muscles, joints, tendons, contract, relax, biceps, triceps	cells, wires, bulbs, switches, buzzers, battery, circuit, series, conductors, insulators**,** amps, volts,

	Year 1 and 2	Year 3 and 4	Year 5 and 6
Summer 1	The Unsinkable Ship?	What Did the Greeks Do For Us?	Stone Age- Carving the Way Forward?
	Animals Including Humans (Y2)	**Animals Including Humans (Y4)** (digestive system, teeth)	**Living things and Habitats (Y6)** Classification
National Curriculum Objectives	Pupils should be taught to: -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 exercise, eating the right amounts of different types of food, and hygiene	Pupils should be taught to: -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 -	Pupils should be taught to: -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 -give reasons for classifying plants and animals based on specific characteristics
Assessment	**TAPS:** Interpret and Report (Rocket Mice)	**TAPS:** Interpret and Report (Teeth in liquids)	**TAPS:** Interpret and Report (invertebrate research)
Working Scientifically	Pupils should be taught to: -identify and classify, using scientific language to communicate ideas	Pupils should be taught to: -report on findings from enquiries, including oral and written explanations, displays or presentations and conclusions -identify differences, similarities or changes related to simple scientific ideas and processes	Pupils should be taught to: Report and present findings from enquires, including conclusions and casual relationships, in oral and written forms such as displays and other presentations, using appropriate scientific language
Key Knowledge	-Know that we are humans and that we have basic needs to survive. -Know where we can get what we need from. -Discuss our own opinion and needs and how that may differ to others. -Know what it means to be healthy. -Know about different types of food and how they impact our weight and health. (Meat, fruit, vegetable, dairy) -Know the importance of hygiene and begin to take responsibility for own hygiene.	- Know about the first stage of digestion and the function of the teeth. -Know how to identify a herbivore, carnivore by its teeth -Know about the basic parts of our digestive system -Know the basic functions of the oesophagus, stomach, small intestine, large intestine, rectum -Know that scientists can learn about animal diets through studying their poo.	- Know about the work of scientists such as Carl Linnaeus (first introduced in Y2) -Know that classification systems group according to similarities and differences. -Build on knowledge from Y4. -Know that the broad groupings of micro-organisms, plants and animals can be subdivided. -Know how to classify animals into commonly found invertebrates and vertebrates -Discuss reasons why living things are placed in one group and not another.

	-Know the importance of exercise and its impact on our physical and mental health. -Know that exercise makes the heart work harder and this is important for a healthy life.		
Sequence of learning	Can I name animals and their offspring? Can I find out what animals and humans need to survive? Can I recognise the differences between what I want and what I need to survive? Can I begin to sort food into broad categories? Can I explain what food is good for me? Can I explain why it is good to be clean? Can I explain why exercise is good for me?	Can I explain the function of the teeth and can I suggest what type of diet an animal has by studying their teeth? Can I name the basic parts of the digestive system? Can I describe the functions of the different parts of the digestive system?	Recap learning from Year 3 / 4 Can I explain Linnaeus' classification system? Can I use classification keys to sort living things according to observable features? Can I test out a range of classification keys and identify potential flaws? Can I design and test a classification key to classify leaves found in our local environment?
Key Vocabulary	Diet, dehydrate, disease, energy, exercise, germs, heart rate, hygiene, nutrition, pulse, meat, fruit, vegetable, dairy	Digestive system, nutrition, mouth, teeth, saliva, oesophagus, stomach, small intestine, large intestine, duodenum, rectum, anus, faeces	Micro-organisms, plants, animals, classification, classify, invertebrates, vertebrates, , kingdom, phylum, class, order, family, genus, species, Linnaeus, classification key, opinion, similarities, differences, group, observations, support, refute

	Year 1 and 2	Year 3 and 4	Year 5 and 6
Summer 2	My Ocean, Your Ocean, Our Ocean?	Can We Live Anywhere?	Can the Rainforest Be Saved?
	Living Things and their Habitats Habitats, Food Chains	**Living Things and their Habitats (Y4)**	**Living Things and Habitats (Y5)** Lifecycles
National Curriculum Objectives	Pupils should be taught to: -identify that most living things live in habitats to which they are suited and describe how different habitats provide 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 micro-habitats -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	Pupils should be taught to: -recognise that living things can be grouped in a variety of ways -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	Pupils should be taught to: -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
Assessment	**TAPS:** Evaluate (Woodlice Habitat)	**TAPS:** Evaluate (local survey)	**TAPS:** Evaluate (life cycle research)
Working Scientifically	Pupils should be taught to: -Use their observations and ideas to suggest answers to questions	Pupils should be taught to: -Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions , Use straightforward scientific evidence to answer questions or to support their findings	Pupils should be taught to: Explain degree of trust in results Identify and evaluate scientific evidence (their own and others) that has been used to support or refute ideas and arguments
Key Knowledge	-Know what is different about things that are living, dead or have never been alive. -Identify some of the plants and animals in a familiar habitat. -Name the microhabitats on the beach e.g. rock pool, shoreline, dunes, wet sand, rocks, sea -Name the animals that live there. -Know why they are suitable for them. -Know what these animals eat. -Explore and order food chains of local animals using appropriate scientific vocabulary	-Generate criteria to use to sort living things. -Sort living things into a Venn diagram. -Sort living things into a Carroll diagram. -Use questions to sort animals using a key. -Use a key to identify invertebrates by looking at their characteristics. (field, pond) -Use the characteristics of living things to sort them using a classification key. -Show the characteristics of living things in a table. -Create a classification key.	-Know the function of the parts of a flower. -Know the differences between sexual and asexual reproduction. -Identify the features of plants pollinated by insects or the wind. -Describe ways plants can be pollinated. -Identify plants that reproduce asexually. -Describe ways to grow new plants other than from seed. -Describe the stages of sexual reproduction in plants.

			-Describe the differences between mammalian, bird, amphibian and insect lifecycles. -Know about Jane Goodall. (Little people Big dreams book) -Describe the stages of the life cycles of mammals, birds, insects and amphibians. -Identify similarities and differences between the life cycles of different plants and animals
Sequence of learning	Can I identify some plants and animals in our garden plot? Can I describe where I would find a range of mini beasts? Can we identify microhabitats around our garden? Can we identify microhabitats on our beach? Can we describe the living things in each microhabitat on the beach and why it suits them? Can we describe the role farms play in the food chain and why they are important? Can I describe a food chain in terms of energy transfer?	Can I understand the characteristics of living things? Can I generate questions to help sort living things? Can I begin to understand how to sort living things into groups by asking questions? Can I make observations in our local habitats and record living things? Can I make close observations and identify some of the living things using classification keys?	Recap learning from Y1 / 2 and Y3 / 4 Can I identify the reproductive parts of flowering plants? Can I explain the differences between sexual and asexual reproduction in plants? Can I explain the differences in lifecycle between mammals, amphibians, birds and insects? Can I record life cycles in the form of annotated scientific illustration? Can I talk about the work of some famous naturalists?
Key Vocabulary	Habitat, microhabitat, living, dead, never living, life processes, food sources, food chain, basic needs, producer, consumer	Organisms, life processes, respiration, sensitivity, reproduction, excretion, nutrition, habitat, environment, endangered species, extinct, classification, vertebrates, invertebrates, specimen, characteristics	Asexual reproduction, fertilise, gestation, life cycle, metamorphosis, pollination, reproduction, sexual reproduction, stamen, style, ovule, stigma, anther,, carpel, sepal, pollination, germination, seed dispersal