Tywardreath School

Science Overview
Key Knowledge, Skills and Vocabulary
Year A

What makes Tywardreath Curriculum unique? A clear focus on local, national and global communities, raising multi-cultural awareness, highlighting aspirational female 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	Amazing Discoveries, Amazing People	Romans – Helpful Invaders?	How Mysterious were the Maya?
	Animals including Humans (Y2) Basic needs, offspring **Human Body (Y1)**	**Forces and Magnets (Y3)**	**Animals Including Humans – Circulatory System (Y6)**
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) -identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Pupils should be taught to: - 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 on whether they are attracted to a magnet, 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.	Pupils should be taught to: -identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood -recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function -describe the ways in which nutrients and water are transported within animals, including humans
Assessment	**TAPS:** Set Up Enquiry (hand spans)	**TAPS:** Ask Questions and Plan Enquiry (shoe grip, strongest magnet)	**TAPS:** Ask Questions and Plan Enquiry (liquid flow through blood vessels)
Working Scientifically	Pupils should be taught to: --perform simple tests	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	-Name and draw our own bodies and label the basic external parts. -Name the 5 senses and discuss our preferences around them. -Describe the basic needs of animals (water food and air). - -Notice that animals have offspring and match adult with their offspring (focus on animals local to us). Notice and describe how our body changes with exercise (timing exercises).	-Identify forces such as push and pull -Describe friction as a force that slows objects down -Feel the pulling force of a magnet -Sort materials according to whether they are magnetic or not -Identify the different poles of a bar magnet -Use a magnetic compass with four points	-Demonstrate prior knowledge of systems within the human body. -Identify the main parts of the circulatory system. -Explain the main functions of the heart, lungs and blood vessels in the circulatory system, including the specific functions of the lungs -State how the digestive system breaks down nutrients. - Explain what constitutes a healthy lifestyle. -Describe how drugs, alcohol and cigarettes can impact negatively on the body. -Understand the processes of how water and nutrients are transported in the body.
Sequence of Learning	Recap Knowledge - Can I name and label the basic external parts of the body? Draw around and label. Can I label more parts of the body & learn new vocab? Can I create bodies using outdoor resources? Can I name the 5 senses & their organs (skin ect) and discuss preferences? Can I name what humans and animals need? Can I describe why exercise is good for us? (PE) Can I describe how our bodies change when we exercise (timing exercises)?	Can I compare how objects move on a variety of surfaces? Can I explore push and pull as forces? Can I explain the effect of friction on the movement of objects? Can I notice that some forces need contact whilst magnetic forces do not? Can I compare and group together a variety of everyday materials based whether magnets attract them? Can I explore how magnets behave towards each other?	Link to prior learning- Can I demonstrate knowledge of systems in the body? (function of skeleton, how muscles work in pairs to support movement) Can I identify main parts of circulatory system? Can I describe the functions of our digestive system? Can I explain how water and nutrients are transported in the body? Can I describe the impact of drugs, alcohol and cigarettes on our bodies? Can I explain what constitutes a healthy lifestyle?
Key Vocabulary	Sight, hearing, touch, taste, smell, eye, ear, mouth, eye, nose, teeth, survival, water, air, food, adult, baby, offspring, exercise, heart, blood, lungs, pulse, sweat, hygiene, germs, fruit, vegetables, carbohydrates, protein, dairy, sugary foods and oils, healthy eating, healthy lifestyle, balanced diet.	Magnetic, force, contact, attract, repel, friction, poles, pull, push, investigate, fair test	Circulatory, heart, blood, vessels, veins, arteries, oxygenated, deoxygenated, valve, exercise, respiration, digestion, absorption

	Year 1 and 2	Year 3 and 4	Year 5 and 6
Autumn 2	Where Are We?	How Can I Find My Way?	How Amazing are The Americas?
	Plants (Y1) Name plants, structure	**Animals including Humans (Y3)** Nutrition	**Evolution and Inheritance (Y6)**
National Curriculum Objectives	Pupils should be taught to: -identify and name a variety of common wild and garden plants, including deciduous and evergreen trees -identify and describe the basic structure of a variety of common flowering plants, including trees	Pupils should be taught to: -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	Pupils should be taught to: -recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago -recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents -identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
Assessment	**TAPS:** Ask Questions and Plan Enquiry (structure)	**TAPS:** Set Up Enquiry (Is is safe to eat?)	**TAPS:** Set Up Enquiry (fossil habitats/egg strength)
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: -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	-Say the names of parts of trees. --Match leaves they have collected to pictures of a leaf. Identify some garden plants that they see in photographs. Name some garden plants from memory. Identify some common plants in the wild. (found on school field daisy, dandelion, pink Campion, clover) Know the leaves of the holly, sycamore, ash and oak. Label the parts of a plant. Sort leaves into groups of deciduous and evergreen. Collect information on a Wild Plant Hunt	-Understand that plants and animals obtain food in different ways. -Identify the right types and demonstrate they understand the right amounts of nutrients for animals including humans. Know how zoos maintain their animals health and well-being.	-Know the difference between inherited traits and adaptive traits. -Know that adaptations are random mutations. -Examine fossil evidence supporting the idea of evolution. -Know and identify the difference between selective and cross-breeding -Develop an understanding of the development of evolutionary ideas and theories over time. -Know how human evolution has occurred and compare modern humans with those of the same genus and family. know Darwin's theory for natural selection
Sequence of Learning	Can I name and draw a range of fruit and vegetables that grow in our garden?	Can I explain how plants and animals obtain their food?	Can I explain the concept of inheritance? Can I explore adaptation?

	Can I name the wild flowers that grow in our hedgerows? Can I name trees by recognising their leaves? Can I sketch and label parts of a vegetable, flower and tree? Can I begin to describe the similarities and differences between deciduous and evergreen trees?	Can I classify food into the main food groups? Can I describe the nutrients animals and humans require to maintain health? Can I design a Healthy menu? Can I explore the different nutritional needs of animals in the wild and in captivity? Can I explore food miles? Can I make informed suggestions about the future of food production?	Can I explore the theories of evolution? Can I identify evidence for evolution? Can I explain how human beings have evolved? Can I examine how adaptation results in both advantages and disadvantages?
Key Vocabulary	Wild plants, garden plants, weed, deciduous, evergreen, roots, stem, leaves, flowers, petals, fruit, seed, bulb	Herbivore, carnivore, omnivore, nutrition, diet, food chain, data , table , bar chart, carbohydrate, proteins, dairy, fats, sugar, vitamins, minerals, fibre, growth, repair, health, energy	Offspring, inheritance, variations, characteristics, adaptation, habitat, environment, adaptive traits, inherited traits

	Year 1 and 2	Year 3 and 4	Year 5 and 6
Spring 1	The Lights of London	What did the Anglo-Saxons do for us?	Were the Vikings Victorious?
	Everyday Materials (Y1) Physical Properties	**Animals Including Humans (Y4)** Food Chains	**Forces (Y5)**
National Curriculum Objectives	Pupils should be taught to: -distinguish between an object and the material from which it is made -identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, rock -describe the simple physical properties of a variety of everyday materials -compare and group together a variety of everyday materials on the basis of their simple physical properties	Pupils should be taught to: -construct and interpret a variety of food chains, identifying producers, predators and prey	Pupils should be taught to: -explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object -identify the effects of air resistance, water resistance and friction, that act between moving surfaces -recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect
Assessment	**TAPS:** Observe and Measure (floating and sinking)	**TAPS:** Observe and Measure (What do owls eat?)	**TAPS:** Observe and Measure (aqua dynamics)
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 materials in our classroom, school grounds etc. Focus on house- Identify and name materials used to make houses. Use observation of houses in the village (make comparisons to those in The Great Fire and links to spread of fire) Begin to discuss which materials are most suitable for walls, rooves, windows and explain why. Outdoor learning opportunity - Den building: Select appropriate materials from the forest school area	Know how to use the terms producers, predators and prey to describe a food chain. Be able to name food chains in the savannah, Tundra, woodland, ocean To begin to know that humans have a responsibility to care about their impact on food chains -know that food chains need to be balanced and what the effects are if they are disturbed -Know how micro plastics have entered the food chain	Know that the force of gravity acts between the Earth and the falling object -Know the effects of air resistance, water resistance and friction, that act between moving surfaces -Know that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect

Sequence of Learning	Can I identify and name materials in our classroom? Can I identify materials used to make houses in our village? Can I describe the properties of materials ? Can I say which materials are most suitable for the different parts of a house and why? Can I build a den in forest school and select suitable materials?	Prior Learning: Food chains from Year 1 / 2 Can I describe a range of food chains? Can I describe food chains across different ecosystems? Can I explain the impact that humans have on some food chains? Can I explore the impact of micro-plastics in our food chains?	Prior Learning: Forces from Y3/4 Can I explain the effect gravity has on unsupported objects of the same mass and of different masses? Can I explain the changes I could make to increase the amount of air resistance I feel when running across the playground or to increase the speed of a turbine windmill? Can I investigate water resistance on falling objects and identify streamlined shapes? Can I investigate how a small force can have a great effect using pulleys and levers? Can I use my knowledge of forces to create a moving toy?
Key Vocabulary	plastic, glass, rock, water , material, flexible, opaque, transparent, soft, squashing, bending, metal , shiny, metallic, group, compare, wood	Herbivore, carnivore, omnivore, producer, predator, prey, flow of energy, tundra, savannah, woodland, oceanic, micro plastic	Gravity, air resistance, water resistance, friction, surface, force, effect, move, accelerate, decelerate, change direction, mechanism, pulley, gear, spring, momentum, Galileo Galleli, Isaac Newton,

	Year 1 and 2	Year 3 and 4	Year 5 and 6
Spring 2	Cornwall to Kenya	Why Does the Earth Move?	Does Alaska Need Saving?
	Animals Including Humans (Y1) Classification, Herbivore, Carnivore, Omnivore	**Rocks (Y3)**	**Living things and Habitats (Y6)** Classification
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 -describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	Pupils should be taught to: -Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties -Describe in simple terms how fossils are formed when things that have lived are trapped within rock -Recognise that soils are made from rocks and organic matter	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:** Record (animal classification)	**TAPS:** Record (rock reports)	**TAPS:** Record (outdoor keys)
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	- record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
Key Knowledge	Name animals that live in the local environment and explain why they live there Name / classify groups of animal's fish, amphibian, reptile, bird and mammal. Know what they have in common. Make links to local animals and classify. Know the meaning of omnivore, carnivore and herbivore. Use this to explain what different animals eat. Make comparisons with animals that live in Kenya.	-name the three different types of rocks and group by their properties -handle and examine rocks to identify their properties, particularly granite -give examples of natural and human-made rocks -explain the difference between a bone and a fossil. describe the importance of granite in Cornwall and links to mining -state four different types of matter that make up soil -explain, using simple scientific language, how soil is formed. - Know why there are different soil types and how this might affect plant life.	-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 about the work of scientists such as Carl Linnaeus

Sequence of Learning	Can I identify and name (classify) a variety of common animals including fish, amphibians, reptiles, birds and mammals. Can I explain what they have in common including with humans? Can I recognise a variety of common birds? Can I talk about a variety of nocturnal animals and how they use their senses, other than sight, to find their way in the dark? Can I identify and name a variety of common animals that are carnivores, herbivores and omnivores? Can I use my knowledge of classification to describe the animals found in Kenya?	Can I compare and group together different types of rock based on their properties? Can I explain how igneous, sedimentary and metamorphic rocks are formed? Can I discover what types are rock are found locally and how that links to our mining heritage? Can I explain how fossils are formed? Can I sort natural rock from man-made? Can I explain where sand our beaches have come from how soils are formed? Can I describe and investigate different types of soil and which plants grow in them?	Link to prior learning in Year 4 : Can I understand the characteristics of living things? Can I generate questions to help sort living things? Do I Know that not all animals have an internal skeleton and that the presence of this is important in classifying them. Can I describe how living things are classified into broad groups based on observable characteristics including microorganisms, plants and animals? Can I explain how the broad groupings of microorganisms, plants and animals can be subdivided? Can I classify animals into commonly found invertebrates and vertebrates? Can I give reasons why living things are placed in one group and not another? Can I talk about the work of scientists such as Carl Linnaeus? Link with St.Andrews wetland reserve in Par-
Key Vocabulary	Amphibians, birds, fish, mammals, reptiles, humans, carnivore, omnivore, herbivore, nocturnal, classify	Grains, crystals, fossils, sedimentary, metamorphic, igneous, Soils, Sandstone, Granite, Marble, Pumice, Crystals, absorbent	Micro-organisms, plants, animals, classification, classify, invertebrates, vertebrates, Carl Linnaeus

	Year 1 and 2	Year 3 and 4	Year 5 and 6
Summer 1	Do I Know the History On My Doorstep?	Who Had the Power?	Crime and Punishment – Who Dunnit?
	Living things and Habitat (Y2) UK/Cornwall	**Sound (Y4)**	**Animals including Humans (Y5)** Body Changes Over Time
National Curriculum Objectives	Pupils should be taught to: Explore and compare the differences between things that are living, dead, and things that have never been alive -Identify that most living things live in habitats to which they are suited -Describe how different habitats provide for 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 microhabitats. -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: -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 get fainter as the distance from the sound source increases	Pupils should be taught to: -describe the changes as humans develop to old age
Assessment	**TAPS:** Interpret and Report (woodlice habitats)	**TAPS:** Interpret and Report (investigating pitch/string telephones)	**TAPS:** Interpret and Report (growth survey)
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	Name animals that live in Cornwall. Know the names of land types and habitats that we have around us- farmland, industry, leisure, beach Know which animals live there and why. Name the microhabitats that we have in our school grounds. Name the animals that live there. Know why they are suitable for them.	Describe sounds around us -Observe how different sounds are made. -Explain how sound sources vibrate to make sounds. -Explain how vibrations change when the loudness of a sound changes. -Explain how sounds travel to reach our ears. -Describe how sounds change over distance. -Describe the pitch of a sound.	- draw a timeline to indicate stages in the growth and development of humans. -describe the changes experienced in puberty. -research the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows

	Know what these animals eat. Explore and order food chains of local animals using appropriate scientific vocabulary	-Describe patterns between the pitch of a sound and the features of the object that made the sound. - Explain how sound travels through a string telephone. -Identify the best material for absorbing sound. -Create a musical instrument that can play high, low, loud and quiet sounds	
Sequence of Learning	Can I name animals that live in Cornwall? Can I names different land types and habitats that we have around us e.g Farmland, industry, leisure, beach ? Can I name the different animals that live there and why? Can I name the microhabitats that we have in our school grounds? Can I name the animals that live there and why? Can I explain what these animals eat? Can I order food chains of local animals using appropriate scientific vocabulary? Link with St,Andrews wetland reserve Par	Can I describe sounds around me? Can I make observations about how different sounds are made? Can I explain how sound sources vibrate to make sounds? Can I explain how vibrations change when the loudness of a sound changes? Can I explain how sounds travel to reach our ears? Can I describe how sounds change over distance? Can I describe the pitch of a sound? Can I describe patterns between the pitch of a sound and the features of the object that made the sound? Can I explain how sound travels through a string telephone? Can I identify the best material for absorbing sound? Can I create a musical instrument that can play high, low, loud and quiet sounds?	Can I draw or annotate a timeline to indicate stages in the growth and development of humans? Can I describe the changes experienced in puberty? Can I compare the gestation periods of other animals with humans; e.g. by finding out and recording the length and mass of a baby as it grows? Can I present my findings? Can I communicate data using a scatter graph? Can I notice any patterns between the relationship of mass of an adult and length of gestation?
Key Vocabulary	Compare, Living , Dead, Alive, Habitat, Suited, Basic needs, Microhabitat, Food chain, Producer, Consumer, Food source	Vibrate, vibration, vibrating, air, medium, ear, hear, sound, volume, pitch, faint, fainter, loud, louder, string, percussion, woodwind, brass, insulate,	Gestation, recording, development, experienced, puberty, scientifically, growth, observations, measurement, appropriate, equipment, analyse

	Year 1 and 2	Year 3 and 4	Year 5 and 6
Summer 2	Fire and Ice	Is Iceland like Cornwall?	What Journey Does a River Take?
	Seasonal Changes (Y1)	**States of Matter (Y4)**	**Properties and Changes of Materials (Y5)** Compare, group and use of materials
National Curriculum Objectives	Pupils should be taught to: -Observe changes across the four seasons -Observe and describe weather associated with the seasons and how day lengths vary	Pupils should be taught to: -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, measure or research the temperature at which this happens in degrees Celsius (°C) -identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Pupils should be taught to: -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 -give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
Assessment	**TAPS:** Evaluate (Seasonal Change)	**TAPS:** Evaluate (drying materials)	**TAPS:** Evaluate (insulation layers)
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	-Name the four seasons -Name the changes across all four seasons -Use weather vocabulary to describe weather in each season -Describe the different lengths of day throughout the year	-Sort materials into solids, liquids and gases and describe their properties -Explain that heating causes melting, and cooling causes freezing. - Identify the melting and freezing point of water. - Describe evaporation and condensation using practical examples -Describe the effect of temperature on evaporation referring to their investigation.	Know how to compare and group together everyday material including by hardness, solubility, transparency, conductivity and response to magnets -Know how to use different methods to separate materials by filtering, sieving and evaporating. -Discuss the uses and needs for different materials in today's world

		- Identify the stages of the water cycle and explain what happens at each stage	
Sequence of learning	Can I observe and describe weather associated with different seasons of the year? Can I describe the different length of daylight in each season? Can I link type of weather with the poles? Can I record how shadow length changes over a day and create bar charts to show this data? Can I help set up rain gauges to measure rainfall or make a wind sock to measure wind direction? Can I record the rainfall or direction of the wind and observing how it may change over time? Can I use thermometers to measure temperature in different locations? Can I use what I have learnt to create a recorded weather forecast for the school website?	Can I sort materials into solids, liquids and gases and describe their properties? Can I explain that heating causes melting, and cooling causes freezing? Can I identify the melting and freezing point of water? Can I describe evaporation and condensation using practical examples? Can I describe the effect of temperature on evaporation referring to my investigation? Can I identify the stages of the water cycle and explain what happens at each stage?	Can I compare and group together everyday materials based on evidence from comparative and fair tests, including hardness, solubility, transparency, conductivity and response to magnets? Can I give reasons based on evidence for the particular uses of some everyday materials? Can I describe how some materials will dissolve in liquid and how I can recover them? Can I use different methods to separate mixtures? Can I demonstrate that dissolving, mixing and changes of state are reversible?
Key Vocabulary	Seasons, Spring, Summer, Autumn, Winter, seasons, weather, daylight, twilight, dusk, shadow, guage, measure, observe, weather forecast	Solid, solidify, iron, ice, melt, freeze, liquid, evaporate, condense, gas, heat, cooled, cool, degrees Celsius, thermometer, water cycle, evaporation, condensation, temperature, melting, warm/cool, water, water vapour	Properties, hardness, solubility, transparency, electrical conductor, thermal conductor, response to magnets, dissolve, solution, separate, separating, solids, evaporation, filtering, sieving, melting, irreversible, burning, chemists, insulation

Science for our future

https://www.natgeokids.com/uk/discover/science/general-science/future-cities/