Biology

Strand: Animals Including Humans

Working Scientifically Drives All of the Substantive Knowledge

Year 1			
NC Objectives	**Key Scientific Knowledge**	**Key Vocabulary**	**Working Scientifically**
To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (including those kept as pets)	To name and identify common fish: gold-fish, clown fish (Nemo!), shark, (extend: trout/pike/ salmon/ cod) Amphibians: frog, newt, toad Reptiles: snake, crocodile, turtle, lizard Birds: robin, blackbird, sparrow, seagull, owl, Mammals: human, dog, cat, fox guinea-pig, hamster, rabbit	Fish, amphibian, bird, mammal, reptile, gold-fish, clown-fish, shark, frog, newt, toad, snake, crocodile, turtle, lizard, robin, blackbird, sparrow, seagull, owl, human, dog, cat, fox guinea-pig, hamster, rabbit, Identify, name, question, answer, conclude, conclusion	**Answering Questions** What fish can I name/identify? What birds do I know the names of? Which ones can I recognise from pictures? Which birds are in my garden vs. at the zoo? **Posing/ Raising questions** Support children in developing simple questions about the topic **Identifying & Naming** Identify and name common animals; share knowledge and care of pets. **Using observation and Ideas to suggest answers** 'This animal has gills and scales so I know it's a fish.' **Presenting/ Communicating Findings (oral focus)** 'We have put these animals in this group because…'
To identify and name a variety of common animals that are carnivores, herbivores and omnivores	To explain that a carnivore only eats meat; that herbivores only eat plant-material and omnivores eat a mixture of plants/meat e.g. dog/	Carnivore, herbivore, omnivore	**Teacher asks questions:** which animals are carnivores/herbivores/omnivores? How do you know? How could you find out?

	lion= carnivore, rabbit/ cow= herbivore, human= omnivore	Sort, group, data, record, research	**Sorting** animals into groups: which are carnivores/ herbivores? How do you know? **Gather and record data** Simple **research**
To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	To understand that fish have scales, fins and no legs; birds are feathered, have wings & beaks and are 2 legged; to know that (most) mammals have hair/ fur. To begin to understand that not all animals fit neatly into 'groups' (e.g. not all mammals have fur/ hair) but are still classified/ grouped as such by scientists. To be able to use language of comparison to describe and compare animals in the same group e.g. same/similar/ different/ bigger/ smaller/ without/ more/ less/ hair/ features.	Gills, scales, fins, beak, wings, limb, fur/ hair, feather, legs, structure Compare, group, sort, observe, observation,	**Ask simple questions**: what are the differences between groups of animals e.g. fish/ bird, in their structure? **Identify & classify:** To use observations to suggest answers to questions: sort animals into groups (e.g. fish/ birds/mammals) and justify choices e.g. 'I put x in the mammal group because it has fur; I put x in the fish group because it has scales and fins).
To identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Underlined ones= 'new' content, building on EYFS)	To identify and name: head, face, neck, chest, arms, hands, fingers , thumb, shoulder, wrist, elbows, tummy, back, legs, knees, ears, eyes, hair, mouth, teeth, nose, tongue, skin, taste-bud, To label each of these on drawings	head, face, neck, chest, arms, hands, fingers, thumb shoulder, wrist, elbows, tummy, back, legs, knees, ears, eyes, hair, mouth, teeth, nose, tongue, skin, taste-bud	**Naming** parts of the body in drawings; point to parts of the body on themselves/ others. **Gather and record data**: sensory field walk **Observation using simple equipment:** Use magnifying glasses to observe taste-buds (* hygiene/ risk assess)

	To identify which part of the body is associated with each sense.	skin, sight, hear, smell, nose, feeling/ touch, taste, tongue, sense, taste-bud conclude, conclusion observe, observation, data	**Answer questions**: Which sense am I using? Chn experiment with senses ('When I eat food, am I just tasting? No, I'm feeling and smelling and seeing too! If I close my eyes and something touches me, I'm relying on my sense of touch.' Experiment with what things taste like when hold our noses closed (very different!)
Year 2			
To notice that animals, including humans, have offspring which grow into adults	To describe in simple terms what the result of reproduction is (making more of parent organisms) To understand that offspring grow into adults To know that some animals lay eggs (not all animals give birth); e.g. birds/ fish/ insects vs mammals.	Reproduction, adult, parent, baby, growth, egg (Some examples of baby/ adult terms e.g. chick/ cub/ kitten), spawn, pupa, tadpole Observation, observe, organism	Using **observations** and ideas to suggest answers to questions (Which animal's young is this? (from pics). Describe/ identify growth of animals from baby/ cub to adult through film/ pics.
To find out about and describe the basic needs of animals, including humans, for survival (water, food and air)	To be able to explain the basic needs to animals e.g. water, food, air, for survival	Survival, nutrition,	**Answer simple questions:** Q: What do animals need for survival? What happens if humans don't have water? How long can a human go without food/ water? (Research link)
To describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	To be able to describe the importance of exercise (keeping healthy) To be able to explain that humans need different food groups for a balanced diet and to eat these in different amounts e.g. not too much sugar; starchy/ meat/dairy/ fruit/ vegetables= majority of diet	Exercise, healthy, heart, muscles Balanced diet, varied, food group; protein, carbohydrate, dairy, fruit & veg, oils/ spreads/ fats/ sugars	**Posing/ Raising questions** Support children in developing simple questions about the topic e.g What happens if… related to diet/ exercise/ hygiene. **Ask simple questions:** Why is exercise/ eating a balanced diet/ being hygienic important? (To stay healthy. What have we learnt about how good hygiene was

	To be able to name food groups e.g. carbohydrates (e.g. bread, starchy foods, pasta, rice), protein; fats; sugars To understand what good, personal hygiene is (e.g. getting rid of germs, Washing hands with warm water & soap to get rid of germs; coughing into elbow; keeping body/ clothes clean; brushing teeth) To understand that viruses and bacteria can spread diseases To be able to explain the importance of being hygienic	Name, label Evidence, conclude, conclusions Hygiene, hygienic, germs, clean, bacteria, virus, disease, Restriction, corona virus	important in limiting the spread of the corona- virus?) Introduce 'eat-well plate', **naming and labelling** food groups. Explore a variety of meals e.g. balanced vs unhealthy; can we explain why this meal is less healthy than the other one using the key language? (**Beginning to notice patterns/ relationships** e.g. the more unhealthy the diet, the larger/ fatter a person might be). Look at **evidence** to make conclusions about someone's lifestyle e.g. healthy vs unhealthy body types (e.g. healthy body shape, good skin. **Ask question:** what measures did scientists suggest to slow the spread of the corona-virus ? E.g. face-masks, social distancing, forming of 'bubbles', washing hands.
Year 3			
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	To be able to describe that animals (including humans) need the right types of nutrition- balanced diet of key food groups. (If they do not, they become unwell/ sick/ unhealthy/ may die)	Nutrients, nutrition, energy, muscle, strength, dehydration, diet (= what you eat, not a restriction), Predicting, prediction	**Predicting:** What might happen if someone is not eating a balanced diet? **Make observations to answer questions** (e.g. What happens if humans do not eat enough vitamins/ food/ water/- watch film/ look at photographs (e.g. Vit C= scurvy, calcium deficiency =rickets)

	To describe the importance of water in our diet (e.g. effects= dehydration) To understand that unlike plants, animals can not make their own food To be able to explain that carbohydrates provide slow-release energy; that proteins build new tissue; that sugars provide energy; that fruit and vegetables provide important vitamins and minerals to keep us healthy	Water, hydration, dehydration, Research, secondary source Carbohydrates, protein, vitamins, minerals, sugars,	Compare/ contrast diets of different animals (including pets); group animals together based on diets **Research** food groups for keeping us healthy/ balanced diet; create balanced meal/ eat-well plate. **To share verbally and then write an explanation** stating what nutrients humans need and why e.g. 'To have enough energy for the day, my body needs carbohydrates which release into blood-stream slowly,' or 'Babies and children need to eat plenty of protein because…' (they are building new tissue while growing). *Teacher can provide stem sentences/ scaffolds to support explanation writing.* Consider what humans need in unusual circumstances e.g. marathon runners carb-loading for days before a race.
To identify that humans and some other animals have skeletons and muscles for support, protection and movement.	To be able to describe the skeleton's function as support for the body (Skull, rib-cage= protection) To identify the muscles' job (attached to bones via tendons) as movement needing energy (from nutrition)	Skeleton, bone, muscle, support, movement, protection (skull/ ribs, rib-cage)	**Ask questions:** How are skeletons different from each other? Explore x-rays of animal; **name and group** animals with skeletons e.g. bird/ fish/ reptile. Which bones give clues as to which animal we're looking at ? jaw/ skull/ ribs/ leg? Compare movement in animals e.g. where are the larger muscles in a kangaroo? Why?

		Record, findings, labels, diagrams, keys, bar charts, tables	*(Extend: animal bone adaptations e.g. bird bones are hollow for flight; shark = cartilage for bendiness)* To **record findings** using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables (e.g. explore bone data for different animals e.g. compare femur length in different animals)
Year 4			
To describe the simple functions of the basic parts of the digestive system in humans	*Revise: To understand that a physical system is a group of organs, managed by the brain, to fulfill a job e.g. circulatory/ skeletal/ nervous/ digestive systems.* To name key organs of the body: brain, lungs, heart, stomach, skin, kidneys, liver, bladder, intestines To be able to name and identify the mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine To be able to explain that we eat food to provide energy and nutrition to keep us healthy To be able to explain the function of each of these (tongue/ taste and move food around mouth; teeth- mechanical break-down of food;	Digestion, system digestive, oesophagus, stomach, small intestine, large intestine, function, acid, nutrients, absorb, energy, saliva, blood-stream, faeces, urine, reabsorb, waste, organ Model, modelling Label, diagram, record,	**Teacher asks relevant questions**: How do we get nutrients from our food? How is food broken down? What job/ function does each part of the digestive system have? Why is the small intestine important? Why is the small intestine 'small' / thin? Explore **models**/ images (organ tunic/ 3d body model) Consider why models have limitations (not actual size/ shape/ colour) **Label/ name** parts of digestive system on diagram **Model** the digestive process:

	oesophagus – tube which connects mouth to stomach; stomach 'cleans' food and begins breaking down food; small intestine – where nutrients and water are absorbed; large intestine- adds/ takes away water & salts as the body needs; faeces past out of body		Making poo! (photos & explanation using key words.) Animations/ play-dough modelling to show process; chn describe the process of digestion (**recording** information from films/ taking notes) to detail the journey of food from mouth to toilet. **Chn answer the question:** what happens during digestion; verbally and then **record** as **written explanation.**
To identify the different types of teeth in humans and their simple functions	To be able to identify in themselves and others (drawings/ observations): incisors, canines, molars (pre-molars) To know that incisors cut food, canines pierce and tear, molars crush and grind food. To describe basic oral hygiene (brushing twice a day; visit dentist every 6 months; to use tooth-paste) and its importance (bacteria feed on sugars, creating plaque which damages teeth)	Incisor, molar, canine, tooth/ teeth Record, data, diagram Observe over time, predict, prediction Oral hygiene, dentist, plaque, bacteria	**Observe & record data:** Create a tally of a partner's teeth consider hygiene- sterilising teeth mirrors/ washing hands) . **Label diagrams** of different teeth Watch animations/ footage of people eating; seeing teeth in action relating to types of food e.g. carnivores/ herbivores **Observation** of animal skulls/ teeth **Observe over time:** what happens to teeth (egg shell) when left in coke for 24 hrs? How does this link to teeth? **Modelling/ predicting** How should we look after our teeth? **Research & present findings**/ poster on advice for good oral hygiene

To construct and interpret a variety of food chains, identifying producers, predators and prey.	To understand that a food chain is a model for showing the feeding relationships between some animals/ plants. To be able to explain what a food chain is (A diagram to show the relationship/link between plants/ animals and food supply). To be able to explain what the arrows show in a food chain (the flow of energy up the chain) To be able to explain what a producer (plants 'produce' their own food from sun's energy), consumer (all animals in food chain); predator (an animal which eats another animal); prey (animal which is eaten by another animal)	Food chain, producer, predator, prey, consumer, nutrition, energy, arrow, diagram Modelling, model Label,	**Create diagrams / models using key scientific language** Create food chains for animals in different habitats e.g. desert/ woodland/ pond/ marine life. (Extend from Yr 2- longer food chains; consider extending/ deepening knowledge with food webs?) **Label** producers, predator/ prey/ consumer. Consider the importance of food chains: (ask question: what happens if many of the rabbits die in a food chain? The fox and grass population is affected). This is the beginning of the study of ecology.
Year 5			
To describe the changes as humans develop to old age.	To describe how a human's body changes as it grows from baby to adulthood	Baby, toddler, child, adolescent, adult, puberty, adulthood, childhood, mass, length, elderly, hair colour, bone density (elderly can suffer with decreased bone density); limb size/ weight, premature, pregnancy, pregnant, birth, death, aging	**Observing over time** (time lapse videos) **Asking Questions:** How does the human body change from baby to adulthood and then old age? **Observations/ gathering data; record info** (note-taking) and **present in different ways** e.g. use of ICT/ speech to class/ David Attenborough style narration (ipad-microphones)

		Pattern-seeking, relationship, data, trend,	**Research** gestation periods in different animals e.g. elephant vs human, dog vs, e.g. **Pattern seeking:** Does an animal with a greater mass always have a longer gestation period? Research to answer. **Gathering data** Tally baby body weights (at birth) for a group of people (What further questions might any data/patterns/ trends raise? E.g. Children who are born before term/ premature are usually lighter. Does being premature affect people physically? Sensitivity needed *
	To understand the changes experienced during puberty *(link to PSHCE)*	Hormone, menstrual cycle, period, muscle growth, voice breaking, body hair, pubic/ facial hair in men; growth of sex organs for reproduction, sex, gender	
Year 6			
	Revise physical systems covered so far e.g. muscular, skeletal, digestive and their importance/ functions.	Physical, system, organ, digestion, muscular, skeletal	
To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	To identify and name the main parts of the human circulatory system e.g. heart, blood vessel, lung, artery, vein, capillaries To describe the function of the heart, blood vessels (artery= away from the heart; veins = to the heart) Heart= pumps bloody around the body via the blood vessels.	Circulation, circulatory, system, blood Vein, artery, heart, capillary, vessel, pulse, chamber (extend to: atrium/ ventricle) (Lung= respiratory system, linked to circ. system= Oxygen, deoxygenated, oxygenated)	**Name and label** the parts of the circulatory system on diagrams/ models. **Teacher asks questions:** What is the importance/ role of the circulatory system? What does the heart do? What happens when you have a heart attack? What is the difference between an artery and a vein? What is a heart-beat (what's happening physically)?

	Lungs (respiratory system) take in oxygen, destined for organs e.g. brain, muscles, digestive system, and get rid of carbon dioxide.	Test, experiment, impact, relationship, rate, measure, pulse,	How might we find out the answer to the question: what is the impact of exercise on the heart? Chn should be able to suggest researching as a method of answering question or testing/ investigation. Then go on to investigate. **Test** the impact of exercise on the heart e.g. measure resting, light and intense exercise heart rates **Present Findings/ Write detailed conclusions** **Evaulate data** (what might have affected the reliability/ validity and accuracy of my results?)
To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	To understand that some drugs can have a harmful effect on the body; To understand that lack of exercise and an unhealthy lifestyle e.g. smoking, poor diet (high cholesterol-clogging arteries) sedentary lifestyle is bad for the body/ long term health.	Drug, harmful, medicine, effect, weight, heart attack,	Make **observations**/chn provide anecdotal evidence about poor lifestyle choices and they **answer questions** e.g. by looking at photos/ written descriptions/ film **Research** the relationship between diet, exercise, drugs, lifestyle and health. Explore varying lifestyles of identical twins. What choices have impact on their bodies/ lives?
To describe the ways in which nutrients and water are transported within animals, including humans.	To state that the blood carries nutrients and water to the organs/ muscles that need them To know that waste products are passed out of the body e.g. excess water in urine; excess Vitamin C	Nutrients, water, transport, toxin, waste, products, Diagram, labelling	Watch film; create **labelled diagrams**/ short written explanations. Consider what happens when toxins get into the body (via the blood) e.g. poison.