Science- Whole School Overview (Biology Topics)

In science we build upon the learning in KS1 and by the end of year 6 we aim for all pupils to have studied a broad and progressive science curriculum, which provides the foundations for understanding the world. We focus on a range of key concepts, skills, knowledge & vocabulary, which ensures pupils have the necessary understanding to embrace the KS3 curriculum. We endeavour for pupils to develop rational explanation, a sense of excitement and curiosity about natural phenomena, to understand how science can explain what is occurring, predict how things behave and analyse causes.

Dobcroft JUNIOR SCHOOL
Together we make a difference

Year 3		
	Spring	**Summer**
Topic	**Animals Including Humans**	**Plants**
Link to School Values	Together we embrace difference	Together we are problem solvers
Recall knowledge and vocabulary	**Y1** • Identify and name a variety of common animals including fish (goldfish), amphibians (frog), reptiles (lizard), birds (blue tit) and mammals (humans, cats, dogs, horses, whales). **Y2** • 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. **Recall the scientific vocabulary of:** growth, child, young/old stages, exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)	**Y2** • Describe the basic structure of a variety of common flowering plants, including trees (oak, daisy, sunflower) using the vocabulary below. • Describe how plants need water, light and a suitable temperature to grow and stay healthy. **Recall the scientific vocabulary of:** Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, light, shade. Names of trees in the local area: oak, pine… Names of garden and wild flowering plants in the local area: dandelion, daffodil, sunflower, daisy,
New Knowledge Concepts & Vocabulary	**New Knowledge Concept:** • 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 (for humans: carbohydrates,	**New Knowledge Concept:** • Identify and describe the functions of different parts of flowering plants (not sunflowers - KS1, tulips or poppies - Y5): - roots (absorb water and nutrients from the soil and to anchor the plant);

	fruits and vegetables, fats and oils, dairy, and proteins. For other animals: children research animals of interest.) • identify that humans and some other animals (such as a mouse, a bird, a snake, a ladybird) have skeletons and muscles for support, protection and movement **Use the scientific vocabulary of:** nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, exoskeleton, endoskeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine.	- stem/trunk (transports water and nutrients and hold leaves and flowers in the air); - leaves (use light energy from the sun and water to make food – photosynthesis); - flowers (enable the plant to reproduce). • Explore (through comparative testing and observation/fieldwork) 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 (trees in school grounds, cress, cactus, waterlily, ferns, variety of seeds packets). • Investigate (through observation over time) the way in which water is transported within plants (celery or carnations). • Explore (through observation and research) the part that flowers play in the life cycle of flowering plants (use flowering plants from hedgerows, school trees, Marjory's Garden or Dug's Garden) including pollination, seed formation and seed dispersal (from school grounds: wind – dandelions; gravity – oak trees; eating – blackberries & M's Garden; sticking to animals – sticky weed. From secondary research: water dispersal – coconuts) **Use the scientific vocabulary of:** Photosynthesis (use but not explain the process) , pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)

Year 4		
	Spring	**Summer**
Topic	**Living Things and their Habitats**	**Animals Including Humans**
Link to School Values	Together we embrace difference	Together we embrace difference
Recall knowledge and vocabulary	**Y1** • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). **Y2** • Identify and name a variety of plants and animals in their habitats, including microhabitats (areas within school grounds)	**Y1** • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. **Y3** • Identify that humans, and some other animals (such as a mouse, a bird, a snake, a ladybird), have skeletons and muscles for support, protection and movement

	Recall the scientific vocabulary of: Fish, amphibians, reptiles, birds and mammals, carnivore, herbivore, omnivore. producer, consumer and predator	**Recall the scientific vocabulary of:** Nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, exoskeleton, endoskeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine.
New Knowledge Concepts & Vocabulary	**New Knowledge Concept:** • Recognise (recap prior learning) that living things can be grouped in a variety of ways (fish, mammals, amphibians, birds, reptiles, carnivores, herbivores, omnivores, skeletons on the inside, skeletons on the outside, mini-beasts). • By look at a range of different examples, explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment (name the trees in the grounds, flowers in Dug's/Marjory's, link with Geography and identify plants in those areas – don't know what they are yet). • Recognise that environments can change and that this can sometimes pose dangers to living things (link with local changes to school environment and geography work – more specificity to follow once geography is complete). **Use the scientific vocabulary of:** Classification, classification keys, environment, habitat, human impact, positive impact, negative impact, migrate, hibernate	**New Knowledge Concept:** • Describe the simple functions of the basic parts of the digestive system in humans: -food enters the mouth, is broken down by the teeth and saliva is added, tongue forms food into a ball for swallowing; - from mouth through oesophagus to stomach; - chemicals to break down food added in stomach; - nutrients are removed from food in the small intestines; - water is removed for use in the body in the large intestines; - what remains enters the rectum and leaves the body through the anus. • Identify the different types of teeth in humans and their simple functions: - incisors for cutting; - canines for tearing; - molars and premolars for Grinding/chewing. • Construct and interpret a variety of food chains, identifying producers (plant life), predators (animal life) and prey (animal life). Food chains will start with sunlight as producers need light energy to produce their food from CO^2 and water – this is the main difference between plant and animal life. **Use the scientific vocabulary of:** Digestive system, teeth, incisor, canine, molar, premolars, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, large intestine (colon), rectum, anus, herbivore, carnivore, omnivore, producer, predator, prey, food chain

Year 5		
	Spring	**Summer**
Topic	**Living Things and their Habitats**	**Animals Including Humans**
Link to School Values	Together we embrace difference	Together we embrace difference
Recall knowledge and vocabulary	**Y1** • Identify and name a variety of common animals including fish (goldfish), amphibians (frog), reptiles (lizard), birds (blue tit) and mammals (humans). **Y3** • name, locate and describe the functions of the main parts of plants including those involved in transporting water and nutrients: • describe the requirements of plants for life and growth • Explore the part that flowers play in the life cycle of flowering plants including pollination, seed formation and seed dispersal **Recall the scientific vocabulary of:** roots; stem/trunk; leaves; and flowers. growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly)	**Y5 prior learning:** • 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 **Recall the scientific vocabulary of:** Life cycle, reproduce, sexual, sperm, fertilises, egg, live young,
New Knowledge Concepts & Vocabulary	**New Knowledge Concept:** • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird - based on first-hand experience: - farm mammals such as cows, pigs, horses or sheep; - farm birds such as chicken or ducks; - insects in the form of butterflies in the classroom; - amphibians through frogs (as close to first-hand as possible – photos from a pond at home for example) . • Describe the life process of reproduction in some plants and animals plants: - sexual reproduction from flowering plants - poppies from seeds and tulips from bulbs; - asexual reproduction - spider plants/aloe vera; - take cutting from plants to show forced asexual reproduction. Animals:	**New Knowledge Concept:** • Describe the changes as humans develop to old age (the physical changes, including identifying body parts, from baby, through puberty, into adulthood and old age) • Understand the process of menstruation This needs to be taught alongside PSHE – see school's Personal Development overview. The new statutory requirements for relationships and health education can be found below: https://www.gov.uk/government/publications/relationships-education-relationships-and-sex-education-rse-and-health-education/physical-health-and-mental-wellbeing-primary-and-secondary **Use the scientific vocabulary of:** baby, toddler, child, adolescent, adult, puberty, testicles, penis, Adam's apple, erection, ejaculation, vagina, vulva, clitoris, discharge, menstruation, period, wet

	- sheep, frogs and/or chickens. NB: human reproduction is covered in Year 6 **Use the scientific vocabulary of:** Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings	dream, hormones, moods, menstruation, periods, ovaries, ovum, uterus, sweat glands, genitals

Year 6			
	Autumn	**Spring**	**Summer**
Topic	**Evolution and Inheritance**	**Animals including Humans**	**Living Things and their habitats**
Link to School Values	Together we embrace difference	Together we are problem solvers	Together we embrace difference
Recall knowledge and vocabulary	Y2 • Notice that animals, including humans, have offspring which grow into adults. • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **Y3 – Rocks** Describe in simple terms how fossils are formed when things that have lived are trapped within rock. **Y4 - Living things and their habitats** Recognise that environments can change and that this can sometimes pose dangers to living things. Identify the different types of teeth in humans and their simple functions **Y5 - Living things and their habitats** Describe the life process of reproduction in some plants and animals. **Recall the scientific vocabulary of:**	**Y3- Animals and Plants** • 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 • Investigate the way in which water is transported within plants **Y4** • Describe the simple functions of the basic parts of the digestive system in humans. **Recall the scientific vocabulary of:** Digestive system, teeth, incisor, canine, molar, premolars, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, large intestine (colon), rectum, anus nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water	**Y4** •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 **Y5** • 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 **Recall the scientific vocabulary of:** fish, amphibians, reptiles, birds and mammals Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings

	environment, habitat, migrate, hibernate, sedimentary rock, fossil Life cycle, reproduce, sexual, asexual, incisors, molars, premolars, canines. carnivore, omnivore, producer, predator, prey,		
New Knowledge Concepts & Vocabulary	**New Knowledge Concept:** ● Recognise that living things have changed over time (Galapagos finches, whales and horses) and that fossils provide information about living things that inhabited the Earth millions of years ago. ● Recognise (through observation) that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents (a range of plants and animals). ● Identify how animals and plants are adapted to suit their environment in different ways (including the peppered moths, camels, polar bears, cactuses, coral) and that adaptation may lead to evolution (specifically Galapagos finches, horses and whales). **Use the scientific vocabulary of:** Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils	**New Knowledge Concept:** •Identify and name the main parts of the human circulatory system, and describe the functions of the heart (pump blood), blood vessels (carry blood) and blood (carry oxygen, carbon dioxide, nutrients, water). • Recognise (through a range of investigation) 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. (Oxygen, nutrients and water are carried in the blood to the parts of the body that they are needed. Carbon dioxide is carried by the blood back to the heart before being pumped back to the lungs.) **Use the scientific vocabulary of:** Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, cycle, circulatory system, exercise, drugs, lifestyle **This content is also included in PSHE. The new statutory requirements for relationships and health education can be found below:** statutory guidance on Physical health and mental wellbeing (primary and secondary).	**New Knowledge Concept:** • 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: - Groupings: plants (make own food)/animals (can't make own food)/micro-organisms/fungi - Within animals: those that have backbones (vertebrates); and those that do not (invertebrates) - Within vertebrates, these are divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics. - Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms. - Plants can be divided broadly into two main groups: flowering plants (sexual reproduction); and non-flowering plants (asexual reproduction). • Give reasons for classifying plants and animals based on specific characteristics. **Use the scientific vocabulary of:** Micro-organism, fungi,