	Science	Year 4
	Term 3 and 4	Topic Title: Animals including Humans

Key Question: What do our bodies do with the food we eat?

National Curriculum Objectives:

- 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.
- Construct and interpret a variety of food chains, identifying producers, predators and prey.

Vocabulary:

Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain

National Curriculum requirement: Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

Chn will need further opportunities to embed key scientific vocabulary outside of Science lessons through the wider curriculum and spelling lessons/homework activities.

Prior Learning:

Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)

• Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans)

• Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans)

• 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. (Y3 - Animals, including humans)

Common misconceptions:

- arrows in a food chains mean 'eats'
- the death of one of the parts of a food chain or web has no, or limited, consequences on the rest of the chain
- there is always plenty of food for wild animals
- your stomach is where your belly button is
- food is digested only in the stomach
- when you have a meal, your food goes down one tube and your drink down another
- the food you eat becomes "poo" and the drink becomes "wee".

Knowledge: Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added.

The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet.

Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing).

Living things can be classified as producers, predators and prey according to their place in the food chain.

Investigative skills

Fair/comparative testing	Identifying and classifying	Observations over time	Pattern seeking	Research
Which liquid does the least damage to an eggshell over time? Make a fair test or comparison by changing one factor and observing or measuring the effect while keeping other factors the same. Use results to draw simple conclusions, suggest improvements and raise further questions that can be answered by extending the same enquiry. Record findings orally and	*What are the names for all the organs involved in the digestive system?* *How can we identify and compare different types of teeth?* Use straightforward scientific evidence to answer questions and support their findings. Interpret data to generate simple comparative statements	*How does the digestive system work?* *How does an egg shell change when it is left in cola or other liquids?* Make systematic and careful observations. *What can a fossil tell us about the diet,*	*Why do animals have different teeth?* Carry out observations and select from a range of resources to gather evidence to answer a question and look for patterns. *Is there a pattern between the size and shape of a bird's beak and the food it will eat?* (Y6 evolution &	*Why do animals have different teeth?* *Do we digest our food in the same way as other animals?* *What if toothbrushes didn't exist?* Chn recognise when secondary sources can be used to answer questions that cannot be answered through practical work.

in writing using scientific language.	based on evidence. *Can you classify observations into evidence for the idea of evolution, and evidence against? (Y6 evolution and inheritance)*	*habitat, features and sizes of living things in the past? (Yr 6 evolution and inheritance)*	inheritance)	*What evidence is there that animals adapt and evolve to suit their habitats? (Y6 evolution and inheritance)*

Significant Scientists: **Ivan Pavlov** (Digestive System Mechanisms) **Joseph Lister** (Discovered Antiseptics) **Washington & Lucius Sheffield-** Toothpaste in a tube	**End point:** Can sequence the main parts of the digestive system Can draw the main parts of the digestive system onto a human outline Can describe what happens in each part of digestive system Can point to the three different types of teeth in their mouth and talk about their shape and what they are used for Can name producers, predators and prey within a habitat Can use diagrams or a model to describe the journey of food through the body explaining what happens in each part Can record the teeth in their mouth (make a dental record) Can explain the role of the different types of teeth Can explain how the teeth in animal skulls show they are carnivores, herbivores or omnivores Can create food chains based on research
Science stories: **Human Body Odyssey -**Werner Holzwarth **Crocodiles Don't Brush Their Teeth-** Colin Fancy **Wolves-** Emily Gravett	
Cross Curricular Links: **English:** Narrative- journey through the digestive system Instructions/explanation- leaflet on dental care. **Maths:** Tables/graphs, explore measurements in the human digestive system and estimate, compare and calculate different standard measurements as well as convert between these measures. **DT:** Making the digestive system/Making teeth **Computing:** Create a Powerpoint about digestive system	**Oracy:** Jumpstart vocabulary "What's the question?" Plan and rehearse an oral story (journey through the digestion system)
Wider Reading	**Enrichment**
The Barn Owl Trust (Further information and owl pellets) Jumpstart Science- Rosemary Feasey/David Fulton	Owl pellets Dentist visit/dental nurse (disclosing tablets)

Sequence of Learning		
Lesson	Key Question	Key learning/notes
1	What is digestion?	• Children recap some of the concepts already explored in the animals including humans topic from Y1-6 with a challenging vocabulary game. "What's the question?" Display a range of answers on the board and challenge children in pairs or small groups to think what the question could have been. E.g *The answer is muscles. What could the question have been?* Challenge chn's questions to get them thinking scientifically. *(See pg 8 Jumpstart Science)* • Children complete a KWL grid and complete **initial assessment quiz** to check prior knowledge. What have children always wondered about humans and how their bodies function? Encourage children to talk in partners about their wonders before adding to working Science display or "wonder wall." • Explain that digestion is the act of softening and changing food so that the body can absorb and use it for energy and growth. • Chn find out which human organs are involved and draw and label a diagram with the new vocabulary learned. • Create a class model of the human digestive system using the outline of a human body.
2	How does the digestive system work?	• Discuss further details of the digestive system including functions of the various organs involved using the tights demonstration. Discuss Ivan Pavlov and his works to unveil the secrets of the digestive system and links with saliva. • Chn to box plan and orally rehearse some descriptive writing about the journey through

		the digestive system (children use senses to explore the sights, sounds, key organs, functions and scientific vocabulary) • Digestive system measuring: Chn to research measurements in the human digestive system and estimate, compare and calculate different standard measurements as well as convert between these measures. Measure and cut string to compare lengths relating to facts such as: The oesophagus is approx. 25cm long in adults. The small intestine is around 6.5m long- it fits inside your body all wrapped up! The large intestine is around 1.5m long (it is called the large intestine as it is much larger in diameter than the short intestine (although it is shorter in length.) • **Homework Research:** Find out what happens when we eat poisonous or bad food and how illnesses can be caused by poor diets.
3	Do we digest our food in the same way as other animals?	• Compare human digestive system to other animals' particularly ruminants (hoofed animal e.g. cattle, camels, giraffes etc.) Chn define carnivores, herbivores and omnivores and investigate examples of each type of animal. • Use Why do animals eat different things? To spark a discussion about animal diets. • Explore owl pellets (the undigested parts of an owl's food which have been ejected through the mouth. Soak for about 30 minutes in water then chn use Science tweezers to tease them apart carefully and use magnifying glasses to make careful observations. (Encourage children to talk about what they see: bones, claws, beaks, feathers, insect parts, seed husks etc) Why might those parts be there? What does this tell us about the animal's diet. What do you wonder about it? Chn make notes in their own books or post-its then record under **I see, I notice, I wonder** as a class on flipchart paper.
4	How do different teeth help animals to bite and chew?	• Look at models of teeth to identify the different types and explore their functions. • Have a dentist or dental nurse visit and carry out a Q & A with practical demonstrations with disclosing tablets. • Use mirrors to look at and count own teeth. How many do they have? Do they look and feel the same? Learn about incisors, canines, (premolars) and molars in more detail. • Compare teeth of different animals. Find out what they are used for. Use Explorify activity for chn to suggest ways of answering the question Why do we have different teeth? **Or** make a model of a full set of human teeth with plasticine (top and bottom jaw). How can they make the molar teeth look flat and bumpy for chewing food? What will the canines need to look like to rip and tear the food? How can we get the flat, chiselled effect of an incisor tooth to make them perfect for biting? Chn write post-it labels with explanation sentences to add to a photo of their model once completed.
5	What can affect the health of our teeth? **Investigation:** ***Which liquid does the least damage to eggshells?*** (Observation over time) **Safety** - Teachers need to be aware of any food allergies chn may have. Take care with glass jars	• Check out this brilliant video of astronaut Chris Hadfield brushing his teeth in space in this BBC clip! What if toothbrushes didn't exist? Explore and discuss this Explorify actvity using simple scientific ideas to answer questions. • Learn about tooth decay and why we must keep healthy so they can do their job! • Study tooth decay and plaque and draw a careful diagram of a tooth by sketching and labelling a cross section of a tooth to create a scientific diagram. (Provide visuals, secondary sources and a model tooth to work from.) • Set up the class inquiry using the investigation template for LKS2. **Which liquid does the least damage to eggshells?** Explain that the eggshell protects the egg a bit like the enamel on our tooth protects the living part inside. Brainstorm a list of things they drink (need to include cola-not diet and also vinegar - perhaps your choice!). Choose about 6 e.g. non-diet cola, milk, water, orange juice, blackcurrant juice, and vinegar. • Can chn remember the sugar investigation from Y3? What effect do they think sugar will have on the health of a tooth (or the egg simulation?) Chn to work in small groups to orally discuss their ideas then write their individual predictions in their books/on the template. Provide chn with method for the investigation-chn to stick in) and from that create a list of equipment they think they will need. • Children will decide how to create a table or chart to record the results and decide how to make the test fair/when to take notes over the week. (provide template examples for children to fill or use as scaffolds to construct their own.)
6	How can we spot and prevent tooth decay? **Investigation**	• Delve into history and explore toothbrushes from the past. The modern toothbrush was invented in 1938, but people were using forms of toothbrushes since ancient times, although it didn't become a habit for most people until the 20th century. Take a closer look at this antique toothbrush Zoom In Zoom Out. • Encourage children to make notes about the ongoing investigation under the subheadings "I see, I notice, I wonder." Have there been any changes/surprises? • Continue with and complete the eggshell enquiry and record the results. • Can we use the results to draw a conclusion? Was our prediction right?

		• Was it a fair test? What could we have done differently? What further questions can we raise? Think, pair and share chn's "wonders." • Chn start a poster about tooth care with clear instructions on how to look after our teeth using their current subject knowledge, observations from the investigation and information from secondary sources including their visitor earlier on in the unit.
7	How do living things depend on each other?	• All living things in a habitat are interdependent. Plants are producers and animals are predators and/or prey. • Chn can investigate a number of general feeding relationships and create food chains to show the transfer of food (energy) from the producer to the consumers. • Play silent and then secret food chains. • A food web is woven from simple food chains and children understand more complex feeding relationships. Explore web of life (revisit activity in term__to recap and build on during living things and their habitats.) • **Briefly** discuss the impact that small changes can have on the whole web (This will be covered in more depth through exploring human impact in Living things & habitats unit.) • Discuss the importance of plants to all life on Earth! Can children recall key facts from KS1 and Year 3 about why they are important?
8	What do our bodies do with the food we eat? Assessment lesson	• Children to edit and improve their "journey through the digestive system" story to publish and complete their dental care posters for display. • What *do* our bodies do with the food we eat? Complete the **end of unit retrieval quiz to check on sticky knowledge**.