Manor Primary School
Subject: Science
Year 3 Autumn Term: Animals including Humans

Overview of the Learning:

In this unit, children will build on from their prior knowledge from year 1 and 2 and will identify those animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food. Children will identify those humans and some other animals have skeletons and muscles for support, protection and movement.

Core Aims

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics about humans and other animals
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Key Concept:

- Function and Growth

Second Order Concept:

- Continuity and change - observing what changes and what stays the same

Prior Learning:

- **Year 1** – 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
- **Year 2** - notice that animals, including humans, have offspring which grow into adults and find out about and describe the basic needs of animals, including humans, for survival (water, food and air)

End Point:

- 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
- identify that humans and some other animals have skeletons and muscles for

Disciplinary Knowledge:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams,
- keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest
- improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.

Substantive Knowledge:

- What are the food groups?
- What is a balanced diet?
- What are the benefits of eating foods from all food groups?
- What is a food allergy?
- What does food intolerance mean?
- What is a vegetarian?
- What is a vegan?

- support, protection and movement communicate and model in order to explain and develop ideas, share findings and conclusions

Post Learning:

- **Year 4 -** describe the simple functions of the basic parts of the digestive system in humans and identify the different types of teeth in humans and their simple functions
- **Year 5** - describe the changes as humans develop to old age.
- **Year 6** – identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood

- What is a carnivore? What is an herbivore? What is an omnivore?
- What is the same for a human and animal diet?
- What is the different for a human and animal diet?
- What is the human skeletal system?
- What is the function of our skeletal system?
- What does vertebrate and endoskeleton mean?
- What is a joint?
- What is a bone?
- What is cartilage?
- What are the different types of skeletal systems that animals can have?
- What does invertebrate and vertebrate mean?
- What does endoskeleton, exoskeleton and hydroskeleton mean?
- What are the muscles?
- What is the job of the muscles in our bodies?
- What are voluntary and involuntary muscles?
- What happens to our muscles when we move?
- What is exercise?
- What happens to our bodies and muscles when we exercise?

Procedural Knowledge:

- How do the food groups help us with a balanced diet?
- How can eating proteins, fruit and vegetables, carbohydrates, dairy and fats help our bodies?
- How can people get all the vitamins and nutrients from different diets due to preference, allergies or intolerance to certain foods?
- How is the diet of a human and that of an animal the same and different?
- How is our skeleton system important to our bodies and how we move?
- How are human endoskeletons made up of bones joints and cartilage? e the names of the bones within a human skeleton?
- How are skeletal systems of different animals different?
- How are the skeletons of a human different or like some animals?
- How do our muscles help our body?
- How do our muscles act when we move?
- How is exercise important for our body?

Curriculum Expectations. Children can:

- identify those 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
- identify that humans and some other animals have skeletons and muscles for support, protection and movement.
- ask relevant questions and using different types of scientific enquiries to answer them
- make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, eg, rulers
- record my findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from my investigations in a variety of ways
- use scientific evidence/ knowledge to answer questions or to support my findings in my work

Outcomes

- identify those 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
- identify that humans and some other animals have skeletons and muscles for support, protection and movement.
- ask relevant questions and using different types of scientific enquiries to answer them
- make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, eg, rulers
- record my findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from my investigations in a variety of ways
- use scientific evidence/ knowledge to answer questions or to support my findings in my work

Cross Curricular links:

Design and Technology - Children will use their knowledge of healthy eating to design, create and evaluate a healthy biscuit
History - Children will have an experience of linking their understanding of nutritional value to rationing, discussing portion size, calorie content and accessible ingredients
Computing – using 2Simple2animate to create a short animation to describe how our skeleton system works
Computing - Creating presentations and advertisements about healthy eating and ensuring our bodies have a balance of the key food groups
English – explanatory writing, creating labels and informative writing. Reading of secondary sources of information about the skeleton system.
Mathematics – measuring and drawing charts and graphs, Venn diagrams
PHSCE – linking learning to healthy bodies and minds. Obesity and reasons why people might turn to food for comfort.

Building Cultural Capital

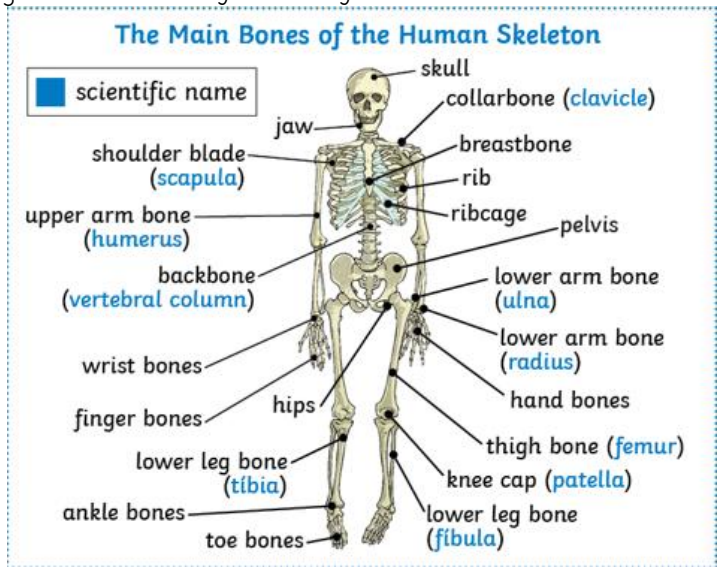
learn about the importance of nutrition and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions.
Gain knowledge of key scientific vocabulary

Learning Objectives	Suggested Learning Opportunities	Vocabulary	Resources and hooks for learning.
To name the different food groups.	**Substantive Knowledge:** What are the food groups? What is a balanced diet?	food group	SHOPPING BAG CHALLENGE!

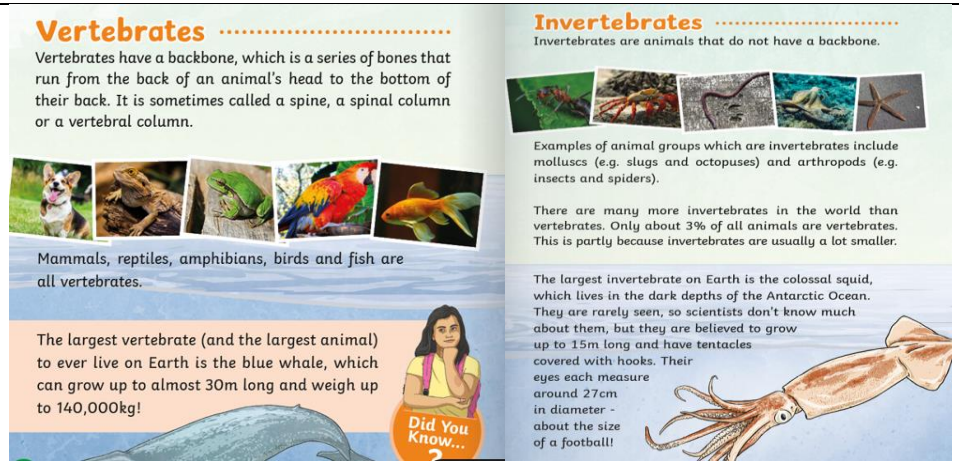
To know what a balanced diet is.	**Procedural Knowledge:** How do the food groups help us with a balanced diet? - SHOPPING BAG CHALLENGE! – Five-minute challenge. Three a mystery shopping bags containing food items– jars, packets, tins, boxes like cereals, pasta, beans, apples, carrots, milk, eggs, cakes, potatoes, bread, bananas, lentils, cheese, chocolate, crisps, yoghurts, beans, pictures of fish, meats, frozen foods. Can we sort the foods they eat into what they think is healthy and what they think is not and label why using post-it-notes. - Share the food plate……to find out what we should be eating and how much.  - Introduce food groups – what do we mean by a food group? Make connections to year 2 knowledge and eating well. - Discuss what food groups are part of our healthy plate? Which is the biggest and why? Which portion of our plate is the smallest and why? Discuss the different food group names – bread, cereals and potatoes (carbohydrates), meat and fish, fruit and vegetables, milk and dairy, and fats and sugars. Discuss what is meant by a balanced diet. - https://healthy-kids.com.au/food-nutrition/5-food-groups/ - Discuss the recommendation of eating 5 portions of fruit and veg a day - '5 a day. - Discuss what is important when eating a balance diet.	proteins, fruit and vegetables, carbohydrates, dairy and fats nutrients vitamins minerals fat protein carbohydrates fibre water	A mystery shopping bag containing food items for them to handle– jars, packets, tins, boxes like cereals, pasta,
To name the different food groups. To present scientific ideas and thinking about what foods we eat and how it helps our bodies	**Substantive Knowledge:** What are the benefits of eating foods from all food groups? **Procedural Knowledge:** How can eating proteins, fruit and vegetables, carbohydrates, dairy and fats help our bodies? **Sticky Knowledge** – What are the food groups? What is important in a balanced diet? What foods are carbohydrates? Can you name foods that are rich in protein? - Explore food items from the different food groups and discuss their importance in nutrition for our bodies e.g protein to help repair and build our muscles. - Explain that we need food for energy and food for growth and discuss the health issues.	food group proteins, fruit and vegetables, carbohydrates, dairy and fats nutrients vitamins minerals fat protein carbohydrates fibre water	

To understand what a balanced diet is. To understand that some people may have different diets due to preference, allergies or intolerance to certain foods.	**Substantive Knowledge:** What is a food allergy? What does food intolerance mean? What is a vegetarian? What is a vegan? **Procedural Knowledge:** How can people get all the vitamins and nutrients from different diets due to preference, allergies or intolerance to certain foods? - Sticky Knowledge – What are the food groups? What foods are carbohydrates? Why do we need to eat carbohydrates and proteins in our diet? Can you name foods that are rich in protein? - **Hook -** YOU ARE WHAT YOU EAT! What is a balanced diet? - Look at a lunch boxes within the class and decide which food groups the contents come from. Were these foods from plants or animals? Link to knowledge from year 2, carnivore and herbivores. - Discuss most people eat both plants and animals, but some people have special diets. - Share clip with the children who has an unfamiliar diet, e.g. vegan, vegetarian – Miss Kaur and what her diet includes and where she supplements proteins from beans, soya, lentils, nuts instead of meats. Explain that being a vegetarian or vegan is like a herbivore as its eating a plant based diet and will be a choice that someone makes. - Explore what the words allergy and tolerance mean. Explain that other people have to be careful about what they eat due to allergies, e.g. peanut allergy, or due to food intolerance, e.g. gluten (coeliac disease), when the body isn't producing enough of the chemicals needed to breakdown particular foods and dairy intolerance. - Explore how people with intolerances and allergies gain the sufficient nutrients to have a balanced diet.	allergy intolerance vegan vegetarian food group proteins, fruit and vegetables, carbohydrates, dairy and fats nutrients vitamins minerals fat protein carbohydrates fibre water	BBC Clips Miss Kaur recording
To understanding and compare the diet of animals to the diet of humans.	**Substantive Knowledge:** What is a carnivore? What is an herbivore? What is an omnivore? What is the same for a human and animal diet? What is the different for a human and animal diet? **Procedural Knowledge:** How is the diet of a human and that of an animal the same and different?	herbivores, carnivores or omnivores, animals, diet, compare, similarities, differences.	

	- **Sticky Knowledge** – What is a food allergy? What does food intolerance mean? What is a vegetarian? What is a vegan? How can a vegetarian have a balanced diet without eating meat? What are the food groups? What foods are carbohydrates? Why do we need to eat carbohydrates and proteins in our diet? Can you name foods that are rich in protein? - **Hook** – Human Diet V's Animal Diets!!! What do animals eat? - Link to prior knowledge from year 2 and discuss what animals eat. - Classify animal diets thinking about scientific terminology- herbivores, carnivores or omnivores based on their diet. - Investigate a range of animals and their diets. https://a-z-animals.com/reference/diet/ https://www.bbc.co.uk/bitesize/topics/z6882hv/articles/z96vb9q - What comparisons can we make about a human and animal diet?		
To know what the function of our skeleton. To name bones using everyday language. To explain the functions of the different bones within our skeleton.	**Substantive Knowledge:** What is the human skeletal system? What is the function of our skeletal system? What does vertebrate and endoskeleton mean? What are the names of the bones within a human skeleton? **Procedural Knowledge:** How is our skeleton system important to our bodies and how we move? - **Sticky Knowledge** – What is a carnivore? What is an herbivore? What is an omnivore? What is a food allergy? What does food intolerance mean? What is a vegetarian? What is a vegan? How can a vegetarian have a balanced diet without eating meat? What are the food groups? What foods are carbohydrates? Why do we need to eat carbohydrates and proteins in our diet? Can you name foods that are rich in protein? - **Hook** – OUR SPECTACULAR SKELETON! What is our skeleton and what is its function? - Show the children a life-sized outline drawing of a Year 3 child. If they were going to create a new class member what body parts would the new child need? - Add suggested body parts to the outline, attempting to place each in the correct position. Continue until the children mention bones or the need for a skeleton.	skeletons – support, protection, function bones vertebrate endoskeleton backbone spine	skeletons – support, protection, skulls – brain ribs – heart, lungs, joint

	▪ Discuss why do we need a skeleton? – Hold the paper pupil and allow him/her to fall to the ground. Share that we would be floppy without our skeleton. What do we know about our skeletons? ▪ Model that not only does our skeleton give us a shape it also allows us to move. Point out that our skeleton is made up of many separate bones (206) so that we can bend and that Interestingly children are born with more individual bones than an adult! ▪ Model the scientific terms of **vertebrate (having a backbone/spine)** and **endoskeleton** when describing aa human skeleton. ▪ Challenge – can they name any parts of our skeleton? How many different types of bones have we got? What are the functions of our skeletons?  ▪ Using the skeleton artefacts, allow the children to lead their own investigations using a range of sources and ICT to find out what the functions are of the skeleton. ▪		
To know what a joint, bone and cartilage What are the functions of the bones, joints and	**Substantive Knowledge:** What is a joint? What is a bone? What is cartilage? **Procedural Knowledge:** How are human endoskeletons made up of bones joints and cartilage?	joint bone cartilage vertebrate endoskeleton	

cartilage in our endoskeleton system.	**Sticky Knowledge** – What is our skeleton and what is its function? How many different types of bones have we got? Play pin the bone on the skeleton to recap on prior knowledge and scientific terminology. - Recap from prior knowledge the scientific terms of **vertebrate (having a backbone/spine) and endoskeleton** when describing a human skeleton. - Discuss with the children bones, joints (ball and socket, hinge, gliding) and cartilage and link to the human skeletal system. What is their function within the human endoskeleton system? - Discuss how important it is to look after our bones – link to food groups – dairy and calcium foods - milk, Vitamin D to make our bones stronger. - Discuss breaks in bones and use of X-rays.		
To explore the animal skeletal system. To understand the different types of skeletons.	**Substantive Knowledge:** What are the different types of skeletal systems that animals can have? What does invertebrate and vertebrate mean? What does endoskeleton, exoskeleton and hydroskeleton mean? **Procedural Knowledge:** How are skeletal systems of different animals different? How are the skeletons of a human different or like some animals? **Sticky Knowledge** – How are human endoskeletons made up of bones joints and cartilage? What does endoskeleton mean? What does vertebrate mean? What is our skeleton and what is its function? How many different types of bones have we got? - Remind children of the functions of the human skeleton – protection, support, movement. - Model that humans share many common characteristics with other animals and like their dietary needs, animals can have different types of skeletal systems. - Introduce vertebrates and invertebrates – what is the difference? Link to humans as vertebrates.	invertebrate vertebrate endoskeleton, exoskeleton and hydroskeleton skeleton	

	 - Discuss endoskeletons (vertebrates), exoskeletons (skeletons on the outside/invertebrate), and hydroskeletons (boneless skeletons made of muscle/invertebrate). - Explain that not all animals have their skeletons inside their bodies (internal or endoskeletons) – vertebrates, e.g. armadillo & tortoises have an endoskeleton and exoskeleton and invertebrates, e.g. insects, crabs, have exoskeletons. - Discuss what functions do these external skeletons have? Protect the softer insides, give structural support to the organs and muscles and facilitate movement of limbs (same as endoskeletons!). - Discuss how some animals with exoskeletons need to moult (shed) their exoskeleton and replace it so that they can grow, e.g. lobsters. - Explain how the new exoskeleton is soft and pliable to start with and the animal pumps itself up using air or water to stretch the exoskeleton to maximum size before it hardens. Other animals grow their shell at the opening as they grow (e.g. snails). Use examples of exoskeletons if available. - Sort Vertebrate, invertebrate, exoskeleton and endoskeleton onto a table/Venn diagram. Explain the function of each type of skeleton		
To know and explain what our muscles are.	**Substantive Knowledge:** What are the muscles? What is the job of the muscles in our bodies? What are voluntary and involuntary muscles? **Procedural Knowledge:**	muscles – movement, pull, contract, relax, pairs, weight, lift,	

	How do our muscles help our body? - **Sticky Knowledge** – What are the different types of skeletal systems that animals can have? - What does invertebrate and vertebrate mean? What does endoskeleton, exoskeleton and hydroskeleton mean? How are human endoskeletons made up of bones joints and cartilage? What does endoskeleton mean? What does vertebrate mean? What is our skeleton and what is its function? How many different types of bones have we got? - **Hook** – MUSCLE POWER!!!!!!!! I GOT THE POWER!!!! Where our muscles are and what do they do? How are you able to move your leg? - Feel the muscles above your elbow. Discuss what happens when you bring your hand to your face, and then back down in front of you? - Link learning on muscles to the skeleton. Share that our muscles enable us to move our bones, because they are attached to the ends of the bones and can shorten or lengthen. When muscles contract (shorten) they allow us to move, so when any part of our body moves, muscles are in action! Often many muscles work together to have a single effect, e.g. it takes 17 muscles for humans to smile (with 17 antagonist muscles relaxing) and 43 to frown – so smile, it's easier!! - Discuss voluntary and involuntary muscles to deepen knowledge.		
To know how muscles act in pairs.	**Substantive Knowledge:** What happens to our muscles when we move? **Procedural Knowledge:** How do our muscles act when we move? - **Sticky Knowledge** – What is the role of our muscles? What are the different types of skeletal systems that animals can have? What does invertebrate and vertebrate mean? What does endoskeleton, exoskeleton and hydroskeleton mean? How are human endoskeletons made up of bones joints and cartilage? What does endoskeleton mean? What does vertebrate mean? What is our skeleton and what is its function? How many different types of bones have we got? - Introduce the scientific terminology of **contraction** as an active process and relaxation as being passive. Ask children to explore their own muscles moving e.g. in their arms and what	muscles – movement, pull, contract, relax, pairs, weight, lift,	

	this feels like. Demonstrate movement by using models illustrating muscles and ask children to explain what the models show. How do muscles work together? - Using a template and some split pins, children create their own model of the human arm, with biceps and triceps pulling the lower arm up and down accordingly. Explain that the muscles always pull and never push, and because of this they often work in pairs to allow movement in both directions - Label the muscles and explain what happens to the muscles in your arm when lifting a weight.		
To understand that exercise is an essential part of a healthy lifestyle. To describe the immediate and long-term effects of exercise on the body.	**Substantive Knowledge:** What is exercise? What happens to our bodies and muscles when we exercise? **Procedural Knowledge:** How is exercise important for our body? - **Sticky Knowledge –** What is the role of our muscles? What are the different types of skeletal systems that animals can have? What does invertebrate and vertebrate mean? What does endoskeleton, exoskeleton and hydroskeleton mean? How are human endoskeletons made up of bones joints and cartilage? What does endoskeleton mean? What does vertebrate mean? What is our skeleton and what is its function? How many different types of bones have we got? - **Hook** - PUMP UP THE JAM! Effects of exercise on the muscles. - **Discuss prior learning on muscles and how the** muscles are essential for movement in everyday life. Explain that the heart is a muscle (cardiac muscle) What job does the heart do? - Model and explain that blood is pumped around the body by the heart muscles contracting and relaxing. The rise and fall of our chests when we are breathing is also muscle controlled. Behind every movement we make is a muscle (two as a pair) working. When we are at our most active muscles really come into their own; this is also when they have to work the hardest. - What happens when we exercise? - Exercise class! Record how children feel before, during and after exercise. Demonstrate how to measure pulse rates using two fingers at the wrist. Explain that measuring the number of times their heart beats, because the pulse is the surge of blood that happens when the	exercise muscles – movement, pull, contract, relax, pairs, weight, lift,	

	heart muscles of the right ventricle contract. How many beats in 15 seconds? Multiply this figure by 4 to calculate beats per minute. Record this figure on the sheet. - After exercise – how do they feel now? How has their body changed? Has their breathing rate increased or decreased? What about their pulse rates?		