Our Science curriculum aims to enthuse children and hep them to be curious and develop a sense of excitement about the world. Through a range of teaching, learning and extra-curricular opportunities, children will develop scientific knowledge and conceptual understanding to recognise the uses and implications of Science, today and for the future. We encourage children to ask their own questions; predict how things will behave and analyse causes, using Science to explain what is happening.

Inspiring and enabling our school community to live life to the full

YEAR 6 SCIENCE

Evolution and inheritance

Characteristics of an Effective Learner

Courage
Commitment
Collaboration
Creativity
Curiosity

Prior Learning:

- In Year 2, children learn about how their change as they grow up and how they might be similar to their parents.
- In Year 3, Children learn about fossils and begin to understand that animal species change over time.
- In Year 4, children learn about how animals may adapt to their environment over time.
- In Year 5, children learn about life cycles and reproduction and how both parents contribute to their offspring.

Key Vocabulary taught in this unit:

Anomaly, camouflage, evolution, extinction, inherited, migrate, natural selection, offspring, variation, classify, evidence, explain, model, adaptation, adapted, fossil, habitat, organism, predator, reproduction, species

Key Questions:

Q: How are living things different?

A species is a group of organisms that can reproduce and have offspring which can also have offspring. There are differences between organisms from different species, and this is called variation. There are also differences between individuals within the same species, and this is also called variation.

Q: How is an organism adapted to live in its habitat?

Any feature of an organism which helps it to survive is called an adaptation. Organisms are adapted to live in specific habitats.

Q: How do an animal's adaptations help it to survive?

An animal's adaptations help it to survive in a specific habitat. A range of different adaptations help animals to survive. If a habitat changes, an animal's adaptations may no longer help it to survive. If all the animals of the same species die out, then the species becomes extinct.

Q: What can fossils tell us?

Fossils provide evidence of organisms that lived millions of years ago. Some of the fossilised species became extinct, while others evolved into new species. Scientists cannot be certain what an organism looked and behaved like from its fossil. Over millions of years, many organisms have changed. When one species develops into another the process is called evolution.

Q: How does evolution happen?

There is variety between individuals of the same species. Offspring are similar but not identical to their parents. The offspring are likely to have inherited these similarities from their parents. If a habitat changes, those organisms which are best suited to the new habitat are more likely to reproduce. Their offspring are more likely to have the survival adaptations of their parents. This process is called natural selection.

Q: How did Wallace and Darwin come up with the idea of natural selection?

Natural selection is also referred to as survival of the fittest. A change in a habitat can cause a plant or animal species to evolve. Charles Darwin and Alfred Wallace both proposed a mechanism for evolution which is called natural selection. They used observations from their travels to formulate their ideas.

Intent: What do we want the children to know, be able to do by the time they complete this unit?

This module builds upon all the Biology-based topics. Evolution is a unifying concept in Biology. Children's learning in previous years about the features of plants, animals and other organisms provides a platform for learning about adaptations and evolution.

Working Scientifically:

Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

Identifying scientific evidence that has been used to support or refute ideas or arguments.

Impact / Outcome:

What will the final product / result be?

Children will learn about the methods scientists use to build scientific knowledge about the natural world.

They will learn that scientists are often not certain about what their findings tell them. When new evidence comes to light they may change their minds.

They will learn that scientists also use models that might not be scientifically accurate, but which help to convey complex ideas to a wider audience.

They will develop an understanding of the following types of enquiry: pattern seeking, research using secondary sources.

P4C Inquiry (where appropriate)

Progression through module	Learning Objective/s	Key Learning/Teaching Points	Possible learning activities	Resources required
1	LO: Can I name the main food groups? Success criteria • I can name the main food groups and give examples of foods that belong to each group. • I can explain why each food group is important. • I can explain the term 'balanced diet'.	**Children stick title page into their books.** Explain to the children that they are starting a new topic all about teeth and eating. Today they will be learning about the main food groups, the type of foods that belong to each group and the impact they have on our bodies. Start by asking the children if they know what the main food groups are? Use slideshow 1 from the snap science website as a prompt if necessary. Dairy Fruit and Vegetables Carbohydrates Protein	**Activity 1** Children stick the pictures of the food groups down the left hand side of a new page in their science books. Next to each picture they write a brief description of each food group and give a couple of examples of foods that belong to that group- see smart notebook. **Activity 2** Explain that next week the children will be finding out what happens to food once we have eaten it. Without telling them anything today, ask the children to draw a diagram on a whiteboard of what they think happens to food in the body once it has entered our mouths. The children can share their ideas with	**Resources:** **Vocabulary:** carbohydrate, fat, sugar, protein, roughage, dairy, fruit, vegetables, vitamins, minerals, balanced diet, healthy

		Fats Explain that it is important to try and have a mixture of all of these foods. Too much of one kind is not good for our bodies. Having the right amount of each food group is called having a 'balanced diet'. Ask ' Does anyone know of any foods that belong to the dairy group? (cheese, milk, butter). Note that some people have allergies to dairy so cannot eat these foods. Repeat with the other food groups making a list on the smart notebook found in the lesson 1 folder.	one another. **<u>Activity 3</u>** Children answer the question 'Why is it important to have a balanced diet'. **<u>Marking comments for books:</u>** **LA: Can you think of an example of a healthy packed lunch?** **Core: Why do professional athletes such as Mo Farah need more protein and carbohydrates than you or I?** **Core: How would a vegetarian or vegan make sure they have a balanced diet?** **MA: Can you create a balanced meal plan for a day?** **<u>Breakfast</u>** **<u>Lunch</u>** **<u>Dinner</u>**	
2	To investigate where our food goes after it has been eaten <u>Success criteria</u> • I can name the basic parts of the digestive system. • I can sequence the parts of the digestive system.	**EXPLORE:** Draw a large outline of a person either on flipchart paper or on the board. Explain to the children that, once food has been eaten, it goes through the body in the digestive system. During this journey the food is digested (broken down) so that it can be used to provide energy for our bodies. **Enlarge** images from Parts of the digestive system (Resource sheet 1) and ask the children to help you put them on the outline of the person. Show the children the parts of the digestive system in a random order and read each of the names. **ENQUIRE:** Tell the children that they will be carrying out activities to help them learn about the main parts of the digestive system and the correct order in which food passes through them. Challenge 1 and 2 are differentiated by the way in which the children present their learning, and in Challenge 3 children carry out additional internet research about the functions of the parts of the digestive system. **REFLECT AND REVIEW:** Ask the children to look back at their original	**Challenge 1:** Children discuss where parts of the digestive system go and help you place them on the outline of body. Ask children to work in pairs or threes to discuss where they think the organs of the digestive system go. Provide The digestive system interactive (Interactive 1) to help them. Ask: *What are the main parts of the digestive system? In what order does food travel through the digestive system?* **Challenge 2:** Children label a diagram of the digestive system- Note: The labelled diagram is not necessarily the order in which food travels through the body i.e. food goes through the small intestine before the large. Provide children with Resource sheet 2 to help them to label the diagram correctly. **They can then use this information to make up a mnemonic to help them to remember the parts of the digestive system.** The first letter of each word begins with the first letter of the digestive system part, e.g. **M**any **o**ld **s**ailors **s**ell **l**ovely **r**ed **a**pples Ask: *What are the main parts of the digestive system? In what order does the food travel through the digestive system?* **Challenge 3:** If time, children research information about the digestive system. Provide use of the **internet** for children to find a relevant website that will help them to put the parts of the digestive system in order, e.g. http://kidshealth.org/kid/htbw/digestive_system.html Ask them to record the function of each part of the digestive system and	**Resources:** Large sheets of paper, poster/mounting putty, camera, access to the internet **Vocabulary:** mouth, oesophagus, stomach, small intestine, large intestine, rectum, anus, digestive system, digestion

		diagrams of the digestive system. Were they correct? Did they miss anything out? Ask the children completing to share their mnemonics. Ask the children who completed Challenge 3 to share their additional facts.	also to write down an additional fact about each part to bring back to their group. Ask: *What are the main parts of the digestive system? What is the function of each part of the digestive system? What else did you learn about each part of the digestive system?* **http://www.bbc.co.uk/guides/z9wk7p3 - What is the digestive system?** **http://www.bbc.co.uk/education/clips/zyqfg82 - An introduction to the major organs in the body** **http://www.bbc.co.uk/guides/zppvv4j - What are the principles of a balanced diet?**	
3	To identify the different teeth that humans have Success criteria • I can name the types of teeth. • I can recognise the types of teeth in my mouth. • I can explain the difference between the teeth of a child and an adult. **Key information:** Children have 20 'first' or 'milk' teeth which start to appear when they are about six months old. These are replaced by 32 adult or permanent teeth after the age of about six years.	**EXPLORE:** Recap the parts of the digestive system from the previous lesson. Remind the children that digestion starts when the food enters the mouth. Ask them to share their ideas with their partner and then in pairs to draw in as much detail as possible what is inside their mouths. At this point do not allow them to look in each other's mouths. Ask the children to think about what is in their mouths and how this may help with digestion. They may mention teeth, tongue and saliva. Explain that the role of the teeth is to help digestion by breaking the food into smaller pieces. Ask children to think about different types of teeth. Use slide 1 of Slideshow 1 to show children that animals have teeth that may be quite similar or very different to human teeth. Use slide 2 to show them the difference between milk and adult teeth. Show video clip http://www.bbc.co.uk/education/clips/zwfj39	**Note: Children should have clean hands before the lesson as they will be touching their teeth.** **Challenge 1:** Children check and record which teeth they have. Provide children working in pairs with My dental record (Resource sheet 1) and a mirror. Ask them to first feel with their finger and then use the mirror to work out what teeth they themselves have and to record this on their resource sheet. When they have done this ask them to check their partner's dental record. Ask: *Do you have the same number of teeth in your top and bottom jaw? What types of teeth do you have? Have you lost any teeth?* **Challenge 2:** Children check and record which teeth they have. Provide children working in pairs with a mirror. Ask them to first feel with their finger and use the mirror to work out what teeth they have themselves and to record them by following the example on Resource sheet 1. When they have done this, ask them to check their partner's dental record. Ask: *What types of teeth do you have? Do you have the same number of teeth as your partner?* *Why might you have different numbers of teeth?* **Challenge 3:** Children learn about the differences between the teeth of adults and children. Provide children with Teeth information sheet (Resource sheet 2). Ask them to read the text carefully, picking out the important clues so that they can write about the teeth of children and adults at	**Resources:** Small plastic mirrors **Vocabulary:** teeth, canine, incisor, premolar, molar, jaw

		g to show the difference between animals teeth **ENQUIRE:** Tell the children that they will be carrying out activities to help them identify what children's teeth are like and to look more closely at their own teeth. Show them 'My dental record' (Resource sheet 1) as a way of recording what teeth they see. Children completing Challenges 1 and 2 will be looking at their own teeth and will have different levels of support for recording what they see. The children completing Challenge 3 will not only look at their own teeth but also use information to work out what teeth people of different ages have. **REFLECT AND REVIEW:** Ask the children to write on a mini whiteboard and display how many teeth they have in their top and bottom jaws. Look at the range. Ask the children why they do not all have the same number of teeth. Ask the children who completed Challenge 3 to share what they have learned about the differences between children's and adult's teeth.	different ages. They should stick the mouth diagram into the middle of their page and write facts around it. Ask: *What can you tell me about children's teeth? What can you tell me about adult's teeth?* Note: Buy chewy sweets, apples and bananas for next week's lesson.	
4	To identify the different types of teeth that humans have and understand their functions. Success criteria • I can name the types of human teeth. • I can explain the function of the different types of teeth. **Key information:** In a model of the mouth, using kitchen utensils, incisors can be represented with scissors, canines with forks and molars with a potato masher.	**EXPLORE:** Remind the children of the different types of teeth that they learned about during the last lesson – incisors, canines and molars. Ask the children to think about why we may have different types of teeth. Gather their ideas. Explain that the teeth have different jobs to do and that during the lesson they will work out for themselves what these jobs are.- **they should already know a bit from the video shown in last week's lesson.** Organise the children into groups and give each group the three types of food – an apple segment, a long chewy sweet and a banana – and the three items of cutlery; scissors, two forks and a potato masher. **If resources are limited you may choose to do this as a demonstration**. Ask the children to try using the different cutlery items to break the food into smaller pieces. Ask the children to share	**Note: Children must have clean hands before touching and eating any food.** **Challenge 1:** Children explore what happens inside the mouth as they eat different types of food. Give each child a piece of apple and a long chewy sweet. Ask them to eat both, paying close attention to what happens inside their mouths. Provide children with a copy of Teeth (Resource sheet 1) to support them with recording what they have discovered. Ask: *Which teeth do you use? What does your tongue do? What is the function of each of your teeth?* **Challenge 2:** Children discuss/explore what happens inside the mouth as they eat different types of food, draw and label teeth and explore the function of different types of teeth. Give each child a piece of apple and a long chewy sweet. Ask them to eat both, paying close attention to what happens inside their mouths. Ask these children to draw and label the different types of teeth and explain the function of each. Ask them to consider how the shape of each type of tooth makes it suitable for its job. Ask: *What is the function of each of your teeth? Why do you think they are*	**Resources:** Scissors, forks, potato mashers, apple segments, long chewy sweets, bananas **Vocabulary:** teeth, canine, incisor, molar, cutting, tearing, grinding

	Health and safety: Children should know that they should never eat anything that they are investigating in a science lesson; however in this case it is safe to do so, but they must wash their hands first and not share sweets or pieces of the apple.	what worked well and what didn't work. Reinforce this with the video Breaking down food (Video 1 from snap science). Establish with the children that the scissors were good for snipping and cutting the food. The forks were good for ripping and tearing the food and the potato masher was good for crushing and grinding the food. **ENQUIRE:** Explain to the children that, just like the kitchen utensils, different types of teeth are good at breaking down food in different ways. Their challenge is to find out what each different type of tooth is good for. Explain to the children that they need to record what they have found out. All children should complete Challenges 1 or 2 depending on the level of support they require with recording. Challenge 3 is an extension activity looking at animals' teeth. **Reflect and Review** Ask the children which types of food works in the same way as each kitchen utensil. Establish that incisors are used for cutting, canines for tearing and molars for chewing. Ask the children working on Challenge 3 to share what they have learned about carnivores, herbivores and omnivores. Herbivores have incisors and molars. Carnivores have incisors and canines. Omnivores have all three types.	*shaped as they are?* *Can you give examples of other sorts of food that you use the different teeth to break down?* **Challenge 3:** Children explore the difference between the teeth of herbivores, carnivores and omnivores After children have completed Challenge 2 provide Interactive 1 for them to match different animals to teeth and to match teeth to types of animal. Which do they think are carnivores, herbivores and omnivores? Ask: What teeth do carnivores have? What teeth do herbivores have? What teeth do omnivores have? Why?	
5	To recognise how to look after our teeth and explain its importance **Success criteria:** • I can describe different ways to look after our teeth. • I can explain why it is important to look after our teeth. • I can give some consequences of not looking after our teeth.	**EXPLORE:** Show children a poster, leaflet or advert about tooth care: https://www.dentalhealthcareeoe.nhs.uk/your-teeth/ What is the main message? Who do they think the intended audience is? Are any facts referred to? Explain to the children that **today they will be presenting information to younger children about how to look after teeth in the form of a poster.** Ask the children to discuss why it is important to go to the dentist. Get them to think, pair,	**Note: Laptops are needed for this lesson** **Challenge 1:** Children watch the video (see left) and make notes in their notebooks about how to care for your teeth. - Brush your teeth twice a day for at least 2 minutes - Spit don't rinse! - Only use a pea size amount of toothpaste - Don't eat too much sugar - Visit the dentist Children create a poster or slideshow for **younger children** to show the different ways we can protect our teeth. Ask children to work in pairs using information and images that they have found from the	**Resources:** Sticky notes, access to computers and the internet for the creation of PowerPoint presentations and research on looking after teeth **Key vocabulary:** teeth, dental

	• I can prepare a PowerPoint presentation suitable for younger children. **Key information:** It is essential that the children identify some appropriate ways to look after their teeth, e.g. regular brushing with toothpaste, flossing, drinking milk, avoiding sugary foods.	share what else we can do to look after our teeth. Gather their ideas and display them. (Brush, floss, not eat and drink too much sugar). **ENQUIRE:** Tell the children that their challenge is to prepare presentations that can be shown to **younger children** to teach them how to look after their teeth. Talk about what they think are the important features of a presentation for younger children. What will the main message be? Do they need to encourage or frighten? What sort of images will be effective? Which facts will be most important? Draw up a class set of success criteria for the activity. Each challenge focuses on a slightly different aspect of tooth care and will require different levels of research. **Reflect and Review** Leave the PowerPoint presentations open on the computers. Allow time for the children to look at other people's presentations and use the success criteria they agreed to assess them. Give them sticky notes. For each presentation that children look at, ask them to write down one thing that they particularly like about the presentation and also to suggest something that could be added or changed. Allow the children a further few minutes to read the comments and adapt their presentations if they wish. Alternatively, children could print and show their presentation to a peer for review. They need to consider the questions "does the presentation give clear information about tooth care?" and "Is it appropriate for younger children?"	internet, to show the different ways we can look after our teeth. Children can be provided with these question prompts to help them with their presentation: What can you do to look after your teeth? How should you clean your teeth and how often? How often should you go to the dentist? **Challenge 2:** Children create a slideshow to show what happens to teeth if they are not looked after properly. Ask children to work in pairs to produce a PowerPoint presentation, using images they have found on the internet, to show what may happen if we do not look after our teeth properly. **Challenge 3:** Children create a slideshow to explain the importance of caring for milk teeth as well as adult teeth. Ask children to work in pairs to produce a PowerPoint presentation, using images from the internet, to explain why it is important to look after your milk teeth as well as your adult teeth	hygiene, decay, dentist, brushing, toothpaste, floss, mouthwash
6	To construct food chains and webs for a particular habitat **Success criteria:** • I can state whether a living thing is a consumer or producer. • I can create food	**EXPLORE:** Show children Interactive 1, which recaps what they learned in Year 2 about food chains. Ensure that they understand the terms **producer** (a source of food for other organisms), **consumer** (an animal that eats a plant or other animal), **predator** (an animal that eats other animals) and **prey** (an animal that gets eaten by another animal). Use activities 1 to 3 to build up simple food chains and then use activity 4 to create a food web.	**Challenge 1:** Children classify animals into predators and prey and make a food chain. Provide children with Resource sheet 1. Ask them to complete the table to show whether each animal is a predator, prey or both. Once they have done this ask them to cut out and arrange the name cards to make a food chain, and then to record this in their books, ensuring the arrows are drawn correctly. Ask: *How many different food chains can you make? Which animals are predators and which are prey?* **Challenge 2:** Children complete a table and food web Provide children with Resource sheet 2 and ask them to complete the table. Once they have done this ask them to use the information in the	**Resources:** Straws, scissors, string, access to the internet or books or research **Key vocabulary:** food, plants, animals, food chain, food web,

	chains/webs from information given. • I can use the food chains/webs to decide whether or not animals are predators or prey or both. **Key information:** It is necessary to explain clearly to the children at this point exactly what a food chain is. A food chain is a linear sequence of links in a food web starting with a species (known as a producer and usually a green plant) that eats no other species, and ending with a species that isn't itself eaten by any other species in the web. This and the other species in the chain are known as consumers.	Show the following video and complete the activities: https://www.youtube.com/watch?v=KFv9ZhunQ60 **ENQUIRE:** Explain to the children that they are going to create food chains and begin to combine these into food webs for different habitats. Challenge 1 is a reinforcement activity for any children who have found it difficult to construct simple food chains. In Challenge 2 children will be constructing a food web based on information given to them, and in Challenge 3 they will construct food webs based on their own research. If children can remember how to construct a food chain from Year 2 make sure that they extend this understanding by taking Challenge 2 or 3. **REFLECT AND REVIEW:** Match each child up with someone who completed a different challenge. Ask them to review each other's work to ensure that the food chains and food webs have been correctly constructed. Put the children into groups of five or six. Give each child in the group one of the food chain cards from Resource sheet 4. Ask them to look at their card to find out whether they have been given a producer or a consumer. Ask them to use lengths of string to join the producer to its consumers and then to make appropriate links between the other consumers to create a giant food web.	table to arrange the living things into a food web. Straws can be cut down or joined together to be the arrows. Ask: *Which animals are predators and which are prey? Which are the top predators?* **Challenge 3:** Children research the diet of animals and create a food web. Provide children with Resource sheet 3 and ask them to use the internet or books to find out what each animal eats. Ask them to use this information to arrange the living things into a food web as in Challenge 2. Ask: *Where did you get your information? Were some websites or books more useful than others? Which animals are predators and which are prey? Which are the top predators?* **https://www.youtube.com/watch?v=UncuC_p_ptg – short, fun summary of food chains**	producer, consumer, predator, prey
7	To construct food chains for some animals living in the African grasslands **Success criteria:** • I can use correctly the terms consumer, producer, predator and prey. • I can sort some animals according to what they eat by looking at their skulls, and in particular their teeth.	**EXPLORE:** Recap on the terms herbivore, omnivore and carnivore, using slides 1 to 3 of Slideshow 1. In groups of 4, the children take it in turns to name an animal. The next person states whether it is a herbivore, omnivore or carnivore and then suggests a new animal. The aim is to promote discussion and to get children thinking about what different animals eat. Use slides 4 to 5 of Slideshow 1 to help the children to understand how a food chain works and to recap on the terms producer, consumer, predator and prey. It is essential that the children understand that all food chains start with producers, that the arrows	**Challenge 1:** Children use pictures of animal skulls to sort animals into herbivores, carnivores and omnivores Ask children to look closely at the teeth in the skulls on Resource sheet 1 and to sort them as herbivores, carnivores and omnivores. Using this information, ask children to put the food chains on Resource sheet 4 in the correct order. Ask: How do you know whether that skull belongs to a herbivore, carnivore or omnivore? How did you sort the animals in the food chain into the correct order? Which are predators? Which are prey? **Challenge 2:** Children use pictures of animal skulls to sort animals into herbivores, carnivores and omnivores and producers and consumers Ask children to look closely at the teeth in the skulls on Resource sheet 2	**Vocabulary:** food chain, food web, energy, producer, consumer, predator, prey, herbivore, omnivore, carnivore

	• I can order the animals in a food chain. **Key information:** This will probably highlight that children do not know what different animals eat. In this lesson children will use teeth as a clue for finding out what an animal eats. A herbivore eats plants only. A carnivore eats meat only. An omnivore eats both plants and meat. A carnivore is a predator as it eats other animals.	show the way in which the food moves and thus in turn the energy being passed on, e.g. from plant to animal and animal to animal, and that although food chains mostly contain only three or four steps, they can be different lengths. **ENQUIRE:** Explain to the children that their challenge today is to be food chain detectives and to determine what certain animals eat and therefore their place in the food chain. All the animals to be investigated live in the African grasslands. The challenges are differentiated by the amount of detail required to observe and sort. Encourage them to take a challenge which will develop their observation and classification skills. **REFLECT AND REVIEW:** Use Interactive 1 to build up different food chains. Ask the children to identify a producer. Drag this into the correct position on the food chain. Ask the children to name a consumer that eats grass. Add this to the food chain. Continue until the food chain is complete. Repeat as necessary.	and to sort and label them as herbivore, carnivore or omnivore. Then provide them with Resource sheet 3. Challenge the children to match the animal to its skull. Check this against Resource sheet 1. Using all this information, ask the children to put the food chains on Resource sheet 5 in the correct order. Ask: What is a producer? What is a consumer? How do you know whether that belongs to a herbivore, carnivore or omnivore? What clues did you use to identify the animal each skull belonged to? How did you sort the food chain into the correct order? **Challenge 3:** Children use pictures of animal skulls to sort animals into herbivores, carnivores and omnivores and producers and consumers, and match the animals to their skulls Ask children to look closely at the teeth in the skulls on Resource sheet 2 and to sort and label them as herbivore, carnivore or omnivore. Give them Resource sheet 3. Challenge them to match the animal to its skull. Using all this information, ask children to put the food chains on Resource sheet 6 in the correct order. Ask: How do you know whether that belongs to a herbivore, carnivore or omnivore? What clues did you use to identify the animal each skull belonged to? How did you sort the food chain into the correct order?	