

YEAR 4: AUTUMN 2 – TIMECOP

SCIENCE: Animals including humans

UNDERSTAND, DESCRIBE AND EXPLAIN: KEY KNOWLEDGE

To understand and describe the simple functions of the basic parts of the digestive system in humans

Learning links:
Science
Year 3: Nutrition and food groups

Digestive system	Nutrients		Substances	Chewing	Swallowing	Enzymes	
Salivary glands	Saliva		Mouth	Teeth	Tongue	Oesophagus	
Stomach	Liver	Pancreas	Gallbladder	Small intestine	Large intestine	Rectum	Anus

The Human Digestive System:

Our **body needs food** to provide it with **energy, vitamins, and minerals**. However, in order to **get nutrients** from the food, we must first **break it down** into **substances** that the various **organs** and cells in our **body can use**. This is the **job** of our **digestive system**. The **digestive system** acts in **stages** to digest our food. Each **stage is important** and **prepares the food** for the **next stage**. The **entire length** of our digestive system is around **20 to 30 feet!**

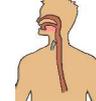
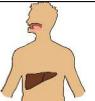
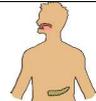
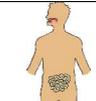
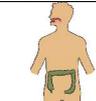
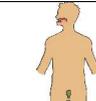
Here are the major stages of the digestive system:

- Chewing:** **Chewing** is the **first stage** of the **digestive system**. When you chew your food, it **breaks up big pieces** into **little pieces** that are **easier to digest** and **swallow**. Also, your **saliva** is more than just water. It has **special enzymes** in it that start to **break down starchy food** (potatoes, bread) while you chew.
- Swallowing:** Swallowing may seem like a simple process to us. It just sort of happens. But food doesn't just fall down our throats into our stomach. First, our **tongue helps to push food** into the **back of our throat**. Then, there are special **throat muscles** that **force the food down** into a **long tube** that leads to our **stomach**, called the **oesophagus**. The food doesn't just fall down the pipe, **muscles push the food** along until it gets to our **stomach**. At the same time, a **flap blocks** off our **windpipe** making sure food doesn't go the wrong way. We call this "going down the wrong pipe" and it can make us **choke**. This flap is called the **epiglottis** and, fortunately for us, it **works automatically**.
- Stomach:** The **next stage** is the **stomach**. **Food remains** in the **stomach** for around **4 hours**. **While** the food sits **there**, more **enzymes break the food down further**, such as **proteins** that our **bodies can use**. The **stomach kills** a lot of **bad bacteria** as well, so we don't get **ill**.
- Small Intestine:** The first part of the **small intestine** works with **juices** from the **liver** and **pancreas** to **continue to break down** our **food**. The **second part** is where the **food** gets **absorbed** from the **intestine** and into our **body through the blood**.
- Large Intestine:** The **last stage** is the **large intestine**. Any **food** that the **body doesn't need** or **can't use** is sent to the **large intestine** and later **leaves the body** as **waste**.

The Liver and Pancreas:

The **liver** and **pancreas** do a lot to **help** the **digestive system** along. Both **work with the small intestine**. The **liver provides bile** (stored in the gall bladder) that **helps break up fat** into smaller bits. The **pancreas provides additional enzymes** to **help digest** all sorts of food. The **liver** also **processes the digested food** from your **blood** before it gets **sent** to various places in your **body to be used**.

The main parts and their functions:

Salivary Glands	Mouth	Teeth	Tongue	Oesophagus	Stomach	Enzymes
 These glands produce saliva. This is mostly made of water and it helps you to chew, taste and swallow food. Saliva contains enzymes which start to break down the food we eat.	 This is the entry point for food where saliva mixes with food. It is the location of the tongue and teeth. The top part of the mouth (soft palate) helps move food along to the oesophagus.	 These are used to tear, cut and grind food into smaller pieces.	 This muscle, located in the mouth, helps mix the food and saliva and move the food to support chewing.	 The muscular tube which forms the path from the mouth to the stomach. Muscles contract and relax to move food down the oesophagus to the stomach.	 Glands line the stomach produce acid and enzymes which breaks the food down further. Muscles in the stomach mix the food.	 Enzymes are special molecules in the body. They act to create a chemical reaction. In the digestive system, the reaction they produce breaks down food.
Liver	Gallbladder	Pancreas	Small intestine	Large intestine	Rectum	Anus
 This organ produces bile which helps to absorb fats. Bile is sent to the gallbladder to be stored.	 This releases bile into the duodenum when needed.	 Produces enzymes to break down fats, proteins and carbohydrates. Releases them into the small intestine.	 The small intestine absorbs nutrients from the food and passes any leftover broken down food to the large intestine.	 This connects the small intestine to the rectum. It absorbs water from waste food and forms the waste into stool.	 This organ stores stool passed to it from the large intestine. It makes the brain aware of a need to go to the toilet.	 This is the end of the digestive process as the anus releases the waste (stool) from the body.

EXPLORE AND INVESTIGATE:

HYPOTHESE
ENQUIRE
TEST
RECORD
REPORT
CONCLUDE

KEY ASSESSMENT AND APPLICATION OPPORTUNITIES:

EXS:

- Can you describe the process of digestion from beginning to end to a specified audience?
- What would happen if we didn't have a _____ as part of the digestive system?
- Explain why our bodies need food.
- What happens to food that the body doesn't need?

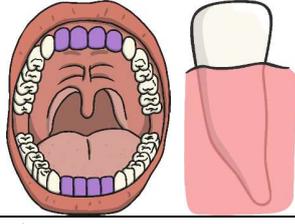
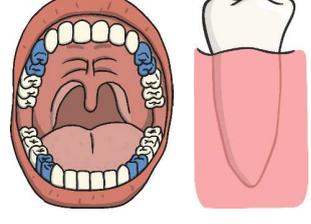
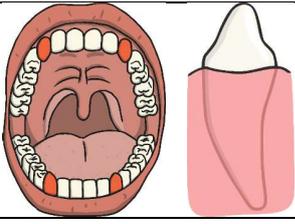
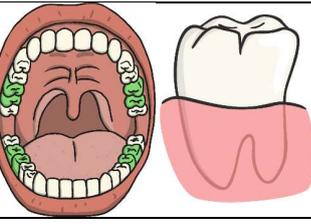
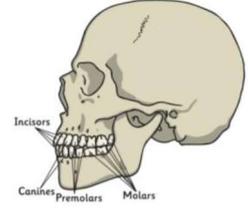
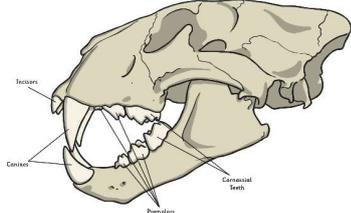
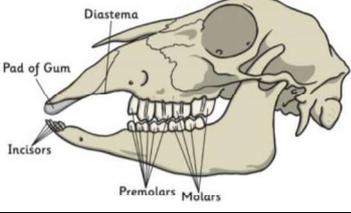
GDS:

- What's an enzyme? Explain its purpose.
- How does the shape of the small intestine help to absorb nutrients into the blood stream?
- Is there a similarity between how plants absorb nutrients/water and how we absorb nutrients/water?
- Why doesn't our stomach acid burn us?
- Do all animals have the same digestive systems? Why are they different?

UNDERSTAND, DESCRIBE AND EXPLAIN:

To identify the different types of teeth in humans and describe their simple functions

Learning links:
Science
Year 4: Digestive System

Teeth	Digestive system	Incisor	Canine	Premolar	Molar	Wisdom	Mouth
Human Teeth:							
Within the <i>mouth</i> , humans have a <i>set of teeth</i> to <i>support</i> the <i>digestive system</i> . Their <i>primary function</i> is to <i>chew</i> and <i>grind up food</i> so that it is <i>easier to pass</i> down the <i>oesophagus</i> and in to the <i>stomach</i> .							
		Incisor:		Premolar:			
		Humans have 8 incisors altogether; 4 in the upper jaw and 4 in the lower jaw. They are shovel shaped and are used for biting in to and cutting off pieces of food.		Humans have 8 premolars, two in each quarter of the mouth. They are between the canine tooth and the molars. They are used for holding and crushing food in to smaller pieces.			
							
		Canine:		Molar:			
		Humans have 4 canine teeth, one in each quarter of the mouth, on either side of the incisors. They are pointy and used for tearing and ripping food.		Humans have 8 molars, two in each quarter of the mouth. They are at the back of the mouth behind the premolars. They are large and flat and used for grinding food.			
							
<p>Different animals have varying sets of teeth based on their diet.</p> <p>Human: This is the skull of a <i>human</i>. A <i>human</i> is an <i>omnivore</i> and eats a <i>varied diet</i> of <i>meat and vegetation</i>.</p> <p>Lion: This is the skull of a <i>lion</i>. A <i>lion</i> is a <i>carnivore</i> and only <i>eats meat</i>. Notice that, <i>similar to humans</i>, the lion has a <i>similar set up</i> of teeth with <i>incisors</i> and <i>canines</i> at the <i>front</i> of the mouth. However, because of a <i>lion's hunting lifestyle</i> and <i>diet of only meat</i>, they require much <i>sharper incisors and canines</i>.</p> <p>Sheep: This is the skull of a sheep. A sheep is a herbivore and only eats vegetation like grass. Again, similar to humans, the sheep has incisors at the front of the mouth and premolars and molars at the back. However, because of the sheep's lifestyle and diet of only vegetation, they do not require any canine teeth. They also do not have any incisors on the top of their mouth. Instead, they have a pad of gum. Consider how this might be of advantage for eating grass.</p>							
							
							

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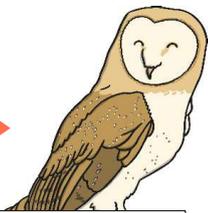
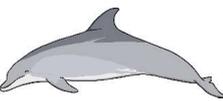
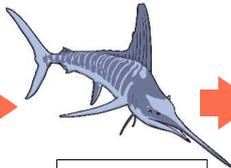
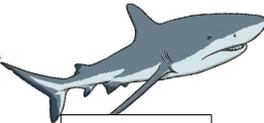
KEY ASSESSMENT AND APPLICATION OPPORTUNITIES:

EXS:

- Are all our teeth the same shape? Why not?
- What are the names of the different types of teeth? Do they do different things?
- Do all animals have the same types of teeth?
- What sort of teeth do hunting carnivores need? Why?
- Do all animals need teeth?

GDS:

- Using your knowledge of teeth, make an educated guess of what the teeth of a _____ would be like and explain your choices.
- Why are the teeth of a carnivore, omnivore and herbivore different?

UNDERSTAND, DESCRIBE AND EXPLAIN:								
To construct and interpret a variety of food chains, identifying producers, predators and prey.	Food chain	Organisms	Energy	Plants	Animals	Photosynthesis	Eaten	Consumed
	Producer	Consumer	Predator	Prey	Primary	Secondary	Tertiary	Quaternary
Understanding Food Chains:								
<p>A food chain shows how plants and animals get their energy.</p> <p>Producers and consumers: A food chain always starts with a producer. This is an organism that makes its own food. Most food chains start with a green plant, because plants can make their food by photosynthesis. This producer is then eaten (consumed) by a consumer. A living thing that eats other plants and animals is called a consumer.</p> <p>Predators and prey: A predator is an animal that eats other animals. The animals that predators eat are called prey. Predators are found at the top of a food chain.</p>								
<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>Producer</p> </div> <div style="text-align: center;">  <p>Primary consumer of the grass & prey of the frog</p> </div> <div style="text-align: center;">  <p>Secondary consumer and predator of the slug & prey of the owl</p> </div> <div style="text-align: center;">  <p>Tertiary consumer and predator of the frog & top of this food chain</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>Producer</p> </div> <div style="text-align: center;">  <p>Primary consumer of the seaweed. Prey of the dolphin.</p> </div> <div style="text-align: center;">  <p>Secondary consumer. Predator of the fish. Prey of the swordfish.</p> </div> <div style="text-align: center;">  <p>Tertiary consumer. Predator of the dolphin. Prey of the shark.</p> </div> <div style="text-align: center;">  <p>Quaternary consumer. Predator/scavenger of the swordfish. Top of the food chain.</p> </div> </div>								
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KEY ASSESSMENT AND APPLICATION OPPORTUNITIES:								
<p>EXS:</p> <ul style="list-style-type: none"> Where does our food come from? Create a food chain where humans are at the top. What do food chains start with? What do they end with? What are a producers/primary consumers/secondary consumers? Can you give me examples? Can some animals be both predator and prey? Give an example. 					<p>GDS:</p> <ul style="list-style-type: none"> What would happen in a food chain if one of the links became scarce? Could this affect other animals? How do the habits of humans impact on natural food chains? Governments have had to put limits on fishing to prevent over fishing. Why? How would this impact on the food chains of wildlife? Now that you understand food chains, explain the importance of plants and vegetation in our world. 			