

CHEWING, CHURNING, FOOD CHAINS AND MORE!

DO YOU KNOW HOW THE DIGESTIVE SYSTEM WORKS?

This inspiring eBook will take you on the incredible journey of food through the human body. Starting with what **digestion** is and why we need it, you'll learn how different types of teeth work together to initially break down food. Then, discover all the incredible organs in the digestive system and what happens to food at each stage.

Explore food chains in the animal kingdom and find out who eats who. Learn about various types of animal diets from **producers** to **scavengers**. Find out more about the world of animal teeth and discover differences in the digestive systems of other creatures.

Curious about how long **intestines** are? Or what really makes that gurgling noise in your **stomach**? How about discovering which animal has teeth made from the strongest biological material? Read on to find out...

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CHEWING, CHURNING AND CHAINS

THE INCREDIBLE JOURNEY OF FOOD

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THE DISCOVERY SQUAD

Join Fizzer, Olivia, Murad, Jack and Cally as they venture into the unknown. Together, these five friends form the Discovery Squad - a dream team of learners.

During their travels, this inquisitive group could be joining different celebrations around the world, or taking a closer look inside the human heart! One day they might be transported back in time to when the ancient Egyptians ruled, while on the next they might voyage into the future to glimpse at incredible scientific discoveries that are yet to be made. They embark on each journey with many important questions and one thing is for certain: they always leave their destination with answers.

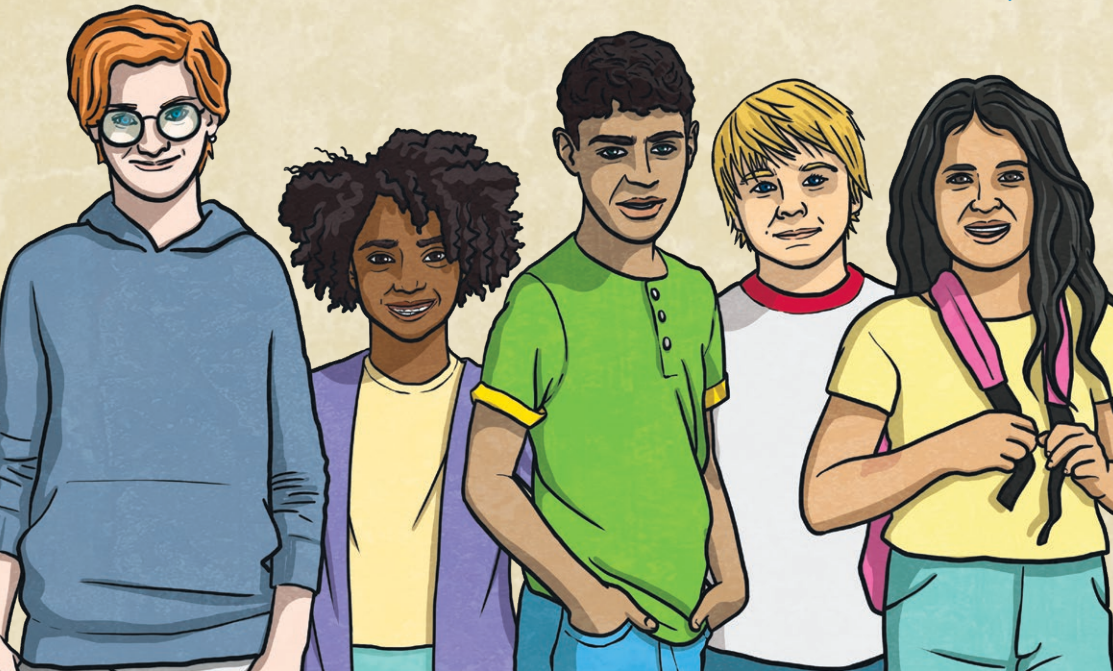
Fizzer

Olivia

Murad

Jack

Cally



CHEWING, CHURNING AND CHAINS

THE INCREDIBLE JOURNEY OF FOOD



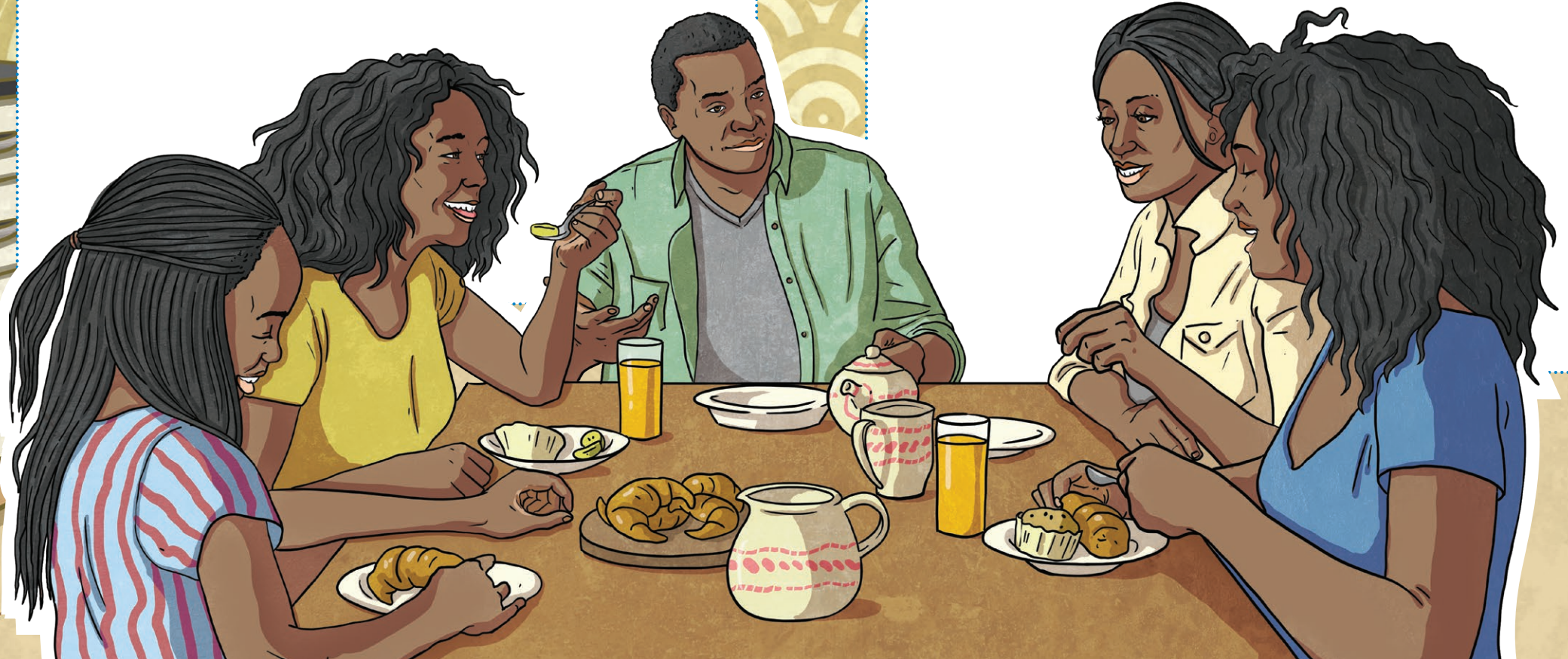
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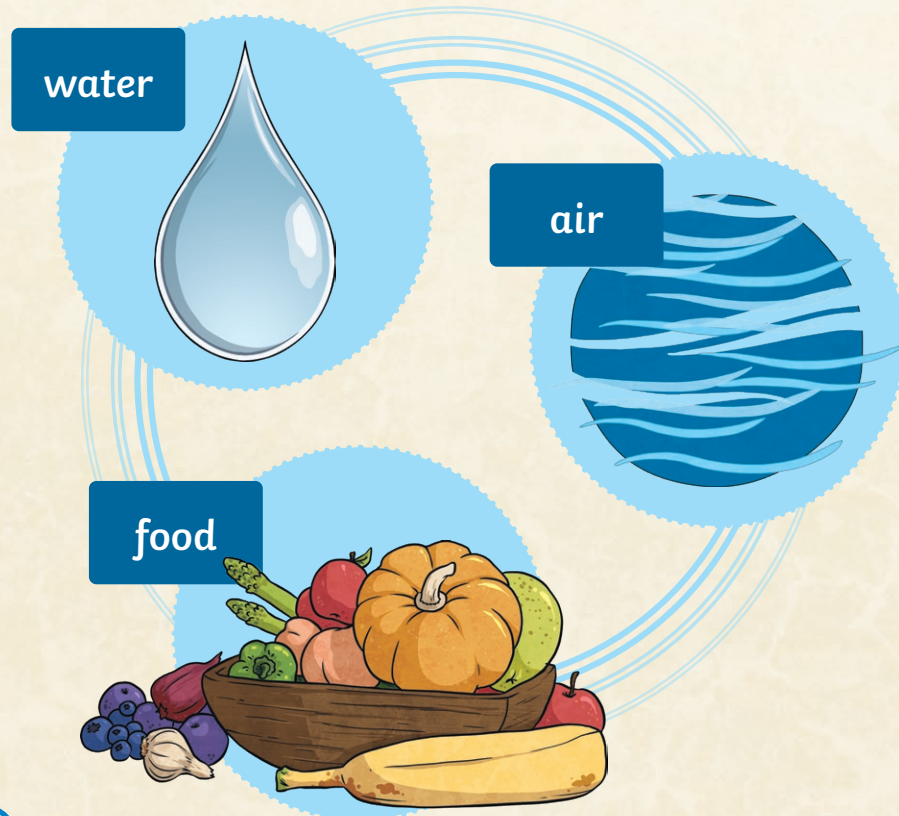
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WHAT IS DIGESTION?

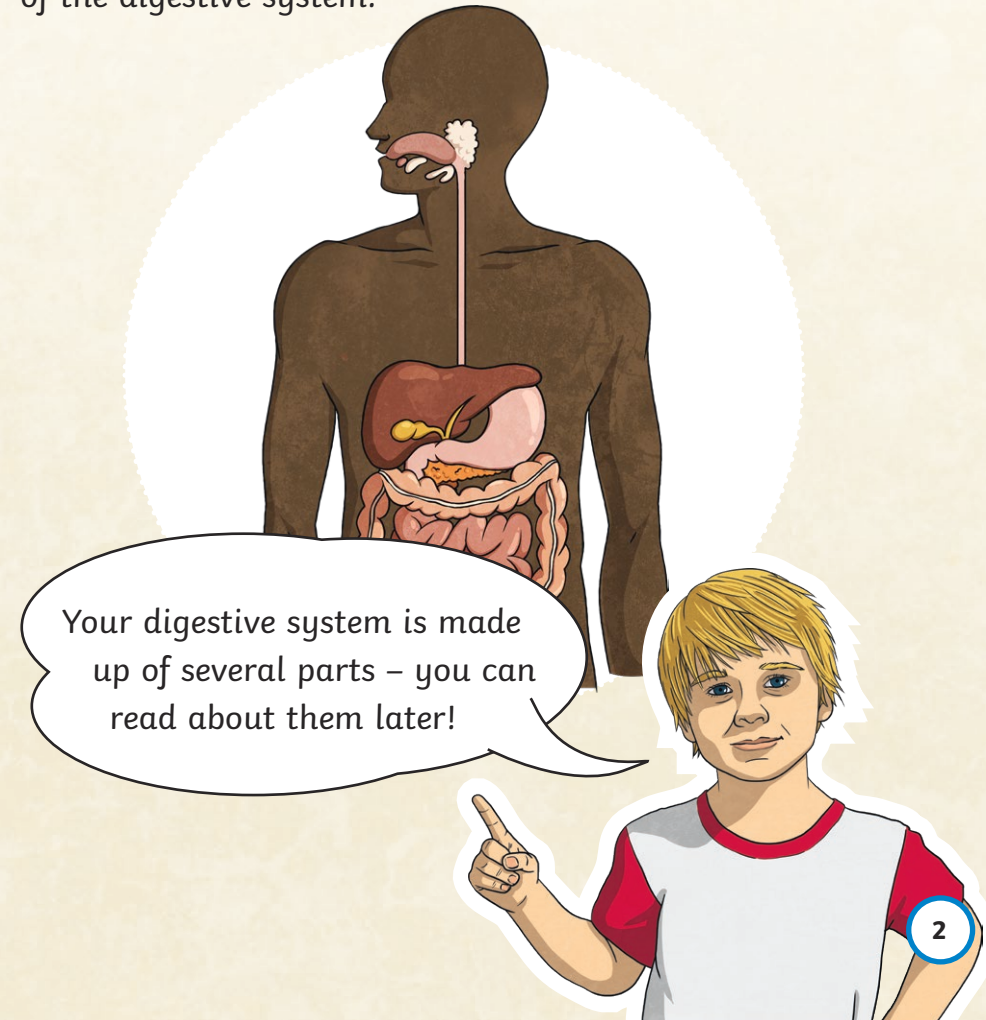
Getting Nutrients from Food

Animals (including humans) need three basic things to survive: water, air and food. Unlike plants, animals cannot make their own food and need to get **nutrients** from the food they eat. This book will explore how humans and other animals extract **nutrients** from their food.



Digestion

Digestion is the process of breaking down food so the **nutrients** in it can be used by the body. **Digestion** starts in the mouth. The teeth, tongue and **saliva** work together to start breaking down the food. The food then continues its journey through the rest of the digestive system.



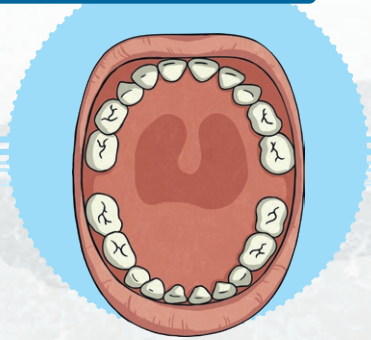
TEETH

Teeth have several important jobs. They allow humans to chew and start **digesting** food, help them speak and help them to form part of their smile and other facial expressions.

Baby and Adult Teeth

Humans have two sets of teeth across their lifetime. The first set are called baby teeth (or milk teeth). These start to develop before birth but the first teeth usually emerge when babies are six to twelve months old. There are 20 baby teeth in a full set and children usually have all of these by the age of three.

baby (milk) teeth



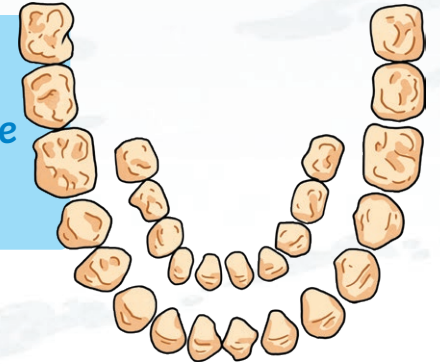
adult teeth



When children reach the age of around five or six, their baby teeth start to fall out. They are replaced by the adult teeth. There are 32 adult teeth in a complete set. Four of these adult teeth are called **wisdom teeth** but not everybody has these.

?

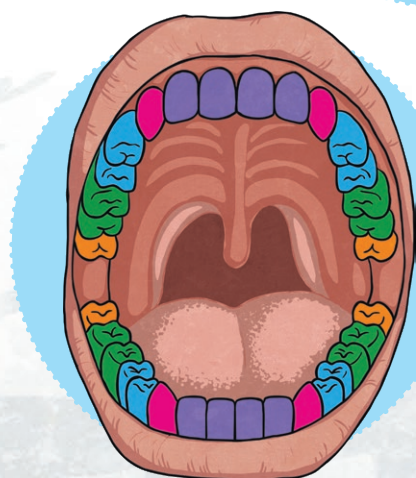
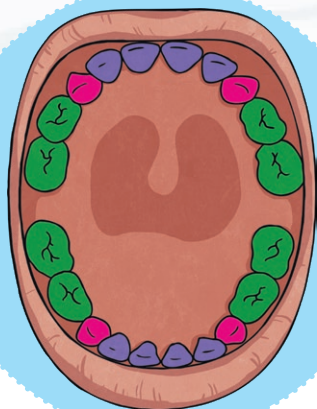
How many more adult teeth are there than baby teeth?



Types of Teeth

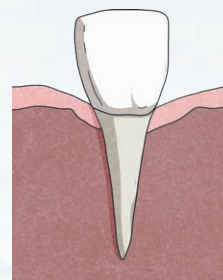
Human teeth are classified into four main groups. They work together to break down the food you eat.

baby (milk) teeth



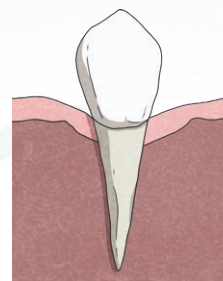
adult teeth

- canines
- molars
- premolars
- incisors
- wisdom teeth



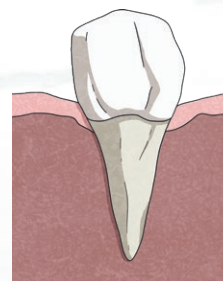
Incisors

In both baby and adult sets, there are eight **incisors**. They are chisel-shaped with a sharp, straight edge to allow them to cut and chop food.



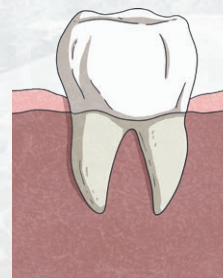
Canines

There are four **canines** in both the baby and adult sets of teeth. They are found next to the **incisors**. Their job is to tear food so they are sharp and pointy to do this.



Premolars (bicuspid teeth)

The **premolars** are only found in the adult set of teeth. There are eight in total next to the **canines**. They are wide teeth with two points called 'cusps'. Their job is to crush and grind food.



Molars

There are eight **molars** in both baby and adult sets of teeth. They are wide and have several cusps to grind food.



Wisdom Teeth (Third Molars)

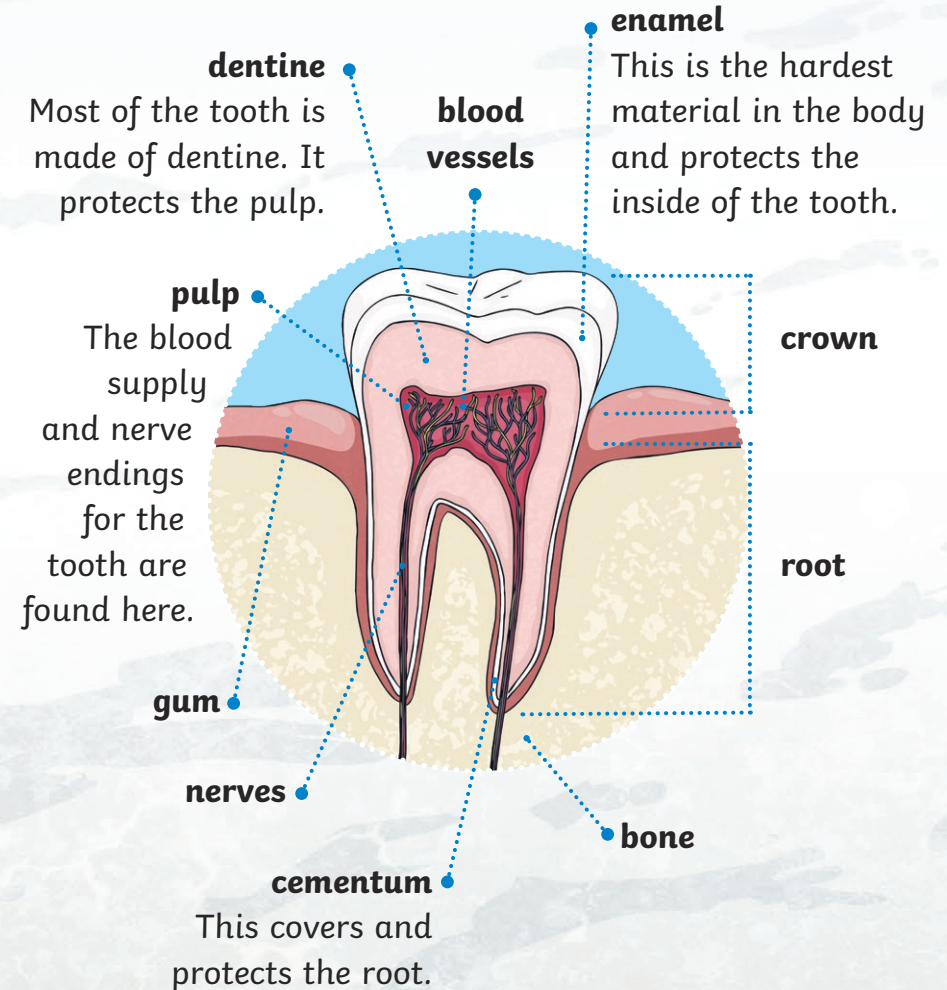
Some people get **wisdom teeth** right at the back of their mouth, several years after all of their adult teeth have come through. Wisdom teeth are extra molars. In total, there are four of these but not everybody gets them. Sometimes, they need to be removed as there is not enough room for them.

Do you wonder why people have **wisdom teeth**? Prehistoric humans used to eat a different diet to us. They ate rough, tough food which wore away their teeth more, so wisdom teeth were beneficial. It is thought that as modern diets have softer, cooked foods, wisdom teeth are now less essential. Modern jaws are smaller, which is why there is sometimes not enough room for **wisdom teeth**.

Did You Know...
?

Inside a Tooth

The part of a tooth not covered by the gum is called the crown. This is the part you can see. The root is hidden by the gum.



Looking After Your Teeth

It is very important for people to look after their teeth. If they don't, it can lead to **tooth decay**. A thin layer on teeth called dental **plaque** can form. This contains bacteria that break down sugars in food and drink and turn them into acid. This can damage the enamel on teeth. There can also be further damage to the dentine and pulp deeper in the tooth. **Plaque** build-up on teeth can also irritate the gums and lead to gum disease. Brushing your teeth properly helps remove **plaque**.



To take care of your teeth, dentists recommend:

- » limiting how much sugary food and drink you have;
- » brushing your teeth properly at least twice a day (including just before bed) for about two minutes with a fluoride toothpaste;
- » spitting the toothpaste out (rather than rinsing) after brushing your teeth because rinsing can stop the fluoride in the toothpaste from working as well;
- » visiting your dentist regularly.

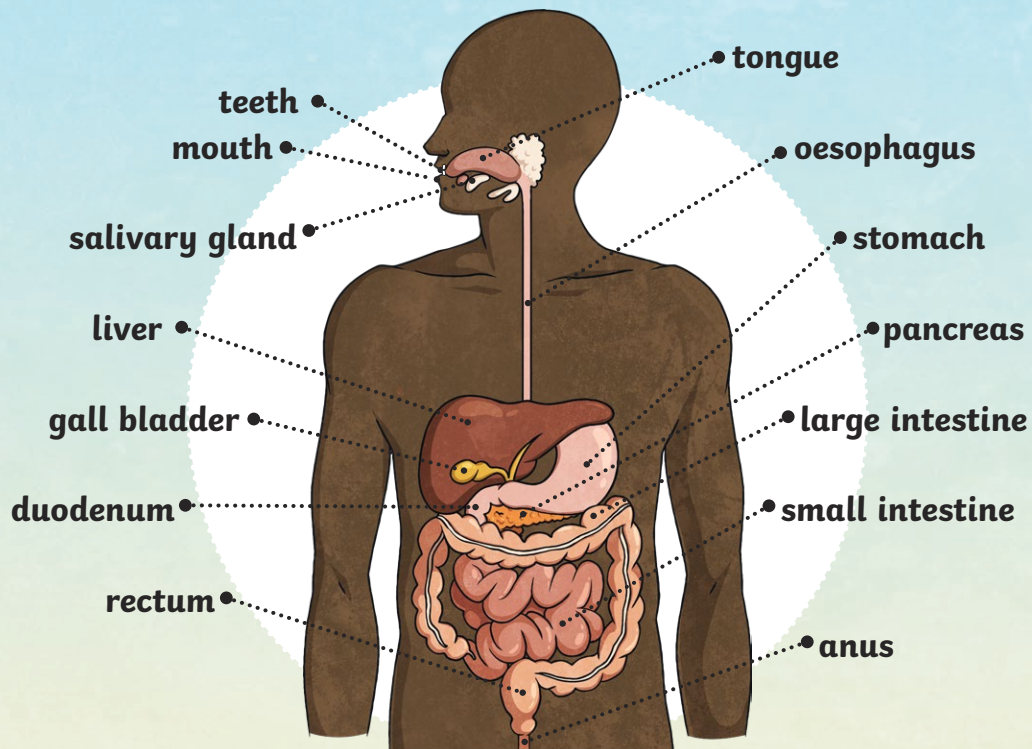


Toothpaste has had some odd ingredients in the past. The ancient Egyptians are reported to have used eggshells and ox hooves. The Romans had oyster shells in theirs.

OVERVIEW OF THE DIGESTIVE SYSTEM

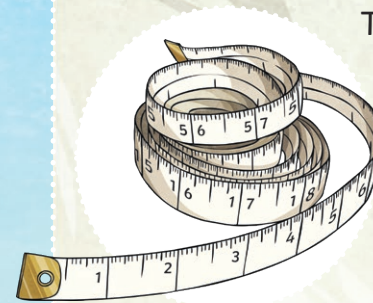
Parts of the Digestive System

The digestive system is a group of organs that work together to digest food. Animals (including humans) digest food to break it down so it can then be used by the body. This process begins in the mouth and ends at the **anus**.



Dazzling Digestion Facts

The **stomach** contains a special acid, which is strong enough to burn skin. Thankfully, there's a **mucus** layer in the **stomach** to protect the inside lining.









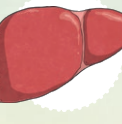
The **small intestine** is around 7 metres long but the **large intestine** is only around 1.5 metres long. They are named according to their **diameters** (the width across), not their lengths. The **small intestine** is much narrower than the large intestine.





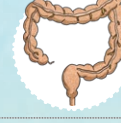


The **stomach** 'growls' all the time, not just when a person is hungry! The rumbling noise you hear is actually caused by bubbles of gas that mix with food as it is digested in the **stomach** and **small intestine**. It is louder when the **stomach** and **small intestine** are empty, because there is no food to absorb the sound. The scientific term for this sound is 'borborygmus'.



Functions

Each part of the digestive system has its own special function (job).

PART	FUNCTION
 mouth	to take food into the digestive system
 teeth	to tear, cut and grind food inside the mouth
 tongue	to move food around the mouth and to swallow
 salivary glands	to produce saliva , which moistens food and helps to swallow
 oesophagus	to transport food from the mouth to the stomach
 stomach	to hold and break down food with acids and enzymes
 liver	to process nutrients and produce bile , which breaks down fat

PART	FUNCTION
 gall bladder	to store bile from the liver and release it into the small intestine
 pancreas	to produce digestive enzymes and release them into the duodenum
 duodenum	to break down food further using enzymes and bile (part of the small intestine)
 small intestine	to break down food from the stomach , absorb nutrients and release them into the body
 large intestine	to absorb water from digested food and form faeces
 rectum	to store faeces
 anus	to release faeces from the body

Follow the incredible journey of your food and the digestive process in more detail on the following pages!



THE DIGESTION PROCESS

Mouth

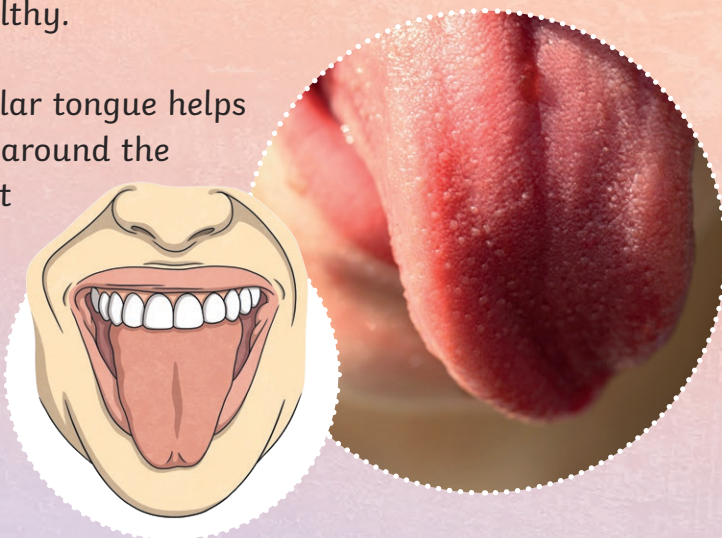
As soon as food is eaten, the **digestion** process starts in the mouth.



The teeth, tongue and **saliva** all have a key part to play. Look back in this eBook to see how teeth use different actions, such as tearing, cutting and grinding, to start breaking food down.

Saliva is a liquid produced by **salivary glands** that makes food easier to swallow by moistening it. Saliva contains substances called **enzymes** that help start breaking down the food. It also has a role in tasting food and keeping the mouth healthy.

The muscular tongue helps move food around the mouth as it is chewed.



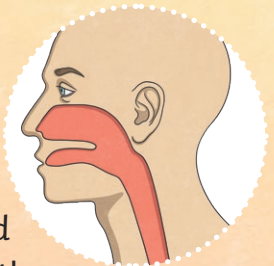
Numbers vary, but a person can produce around 1 litre of **saliva** a day! Next time you have a drink from a bottle, look at the label to see how much is in there and compare it to how much **saliva** a person can produce, or take a look at a measuring jug.

Did You Know...
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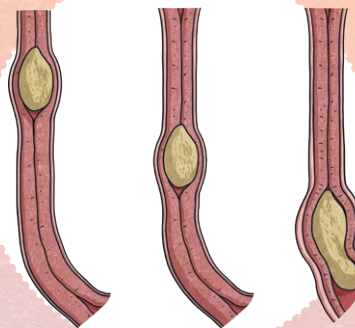
Oesophagus

Once food has been chewed and it has mixed with **saliva**, it forms a small, round ball known as a **bolus**. Swallowing pushes the **bolus** into the throat and it passes down into a muscular tube called the **oesophagus**. The **oesophagus** leads from the mouth to the **stomach**.



Food is transported to the **stomach** through a process called **peristalsis**.

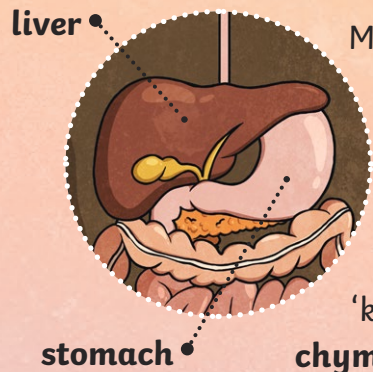
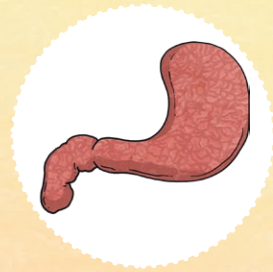
Muscles in the **oesophagus** contract (squeeze together) to form a wave-like movement, which pushes the **bolus** along. It takes approximately 10 seconds for food to travel through the **oesophagus** and reach the **stomach**.



Stomach

The **stomach** is an organ that is a bit like a bag. It holds food while it is broken down further.

In the **stomach**, food is mixed with acid and powerful digestive **enzymes** which start to digest proteins. Because **stomach** acid is so strong, there is a special layer of **mucus** that coats the **stomach** lining and protects it from being damaged.



Muscles in the wall of the **stomach** contract (tighten) and churn the food around. This churning motion, combined with the acid and **enzymes**, breaks the food down further into a thick liquid called **chyme** (pronounced 'kime'). The stomach then releases **chyme** into the **small intestine**.

Food typically stays in the **stomach** for 2-5 hours but this depends on what has been eaten, how much has been eaten and other factors. The body generally digests carbohydrates faster than proteins and fats so these will pass through the **stomach** more quickly.



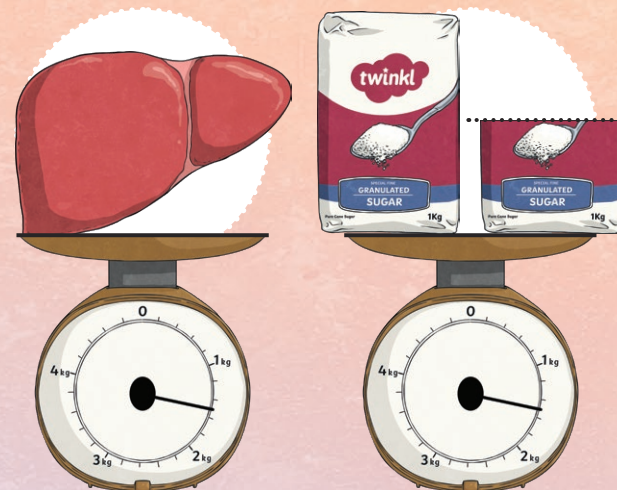
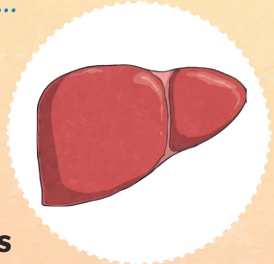
What Are Enzymes?

Enzymes are special substances in your body that help to speed up chemical reactions. There are many different types of **enzymes** and each type can only do one thing. For example, an **enzyme** that helps to break down protein cannot also break down fat. **Enzymes** are very important in the digestive system for breaking down the different **nutrients** in food.



Liver

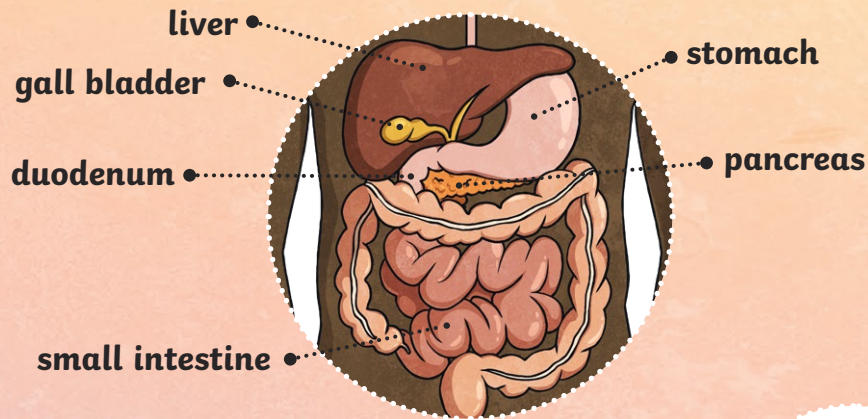
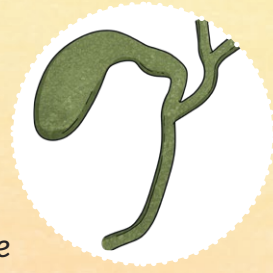
The **liver** is the body's largest internal organ and has many different functions. Food does not pass through it but it still plays a vital role as it processes **nutrients** and produces **bile**. **Bile** is a green liquid that the body uses to break down fats in food. Once the **liver** has produced **bile**, it is then stored in the **gall bladder**.



The average adult human **liver** is about the size of a football and weighs 1.5kg. This is same weight as one and a half bags of sugar.

Gall Bladder

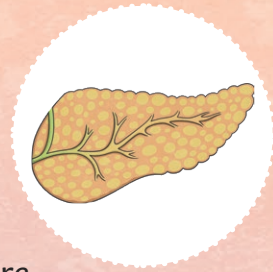
The **gall bladder** is a small organ that stores **bile**, which has been made by the **liver**. The **gall bladder** releases the liquid **bile** into the first part of the **small intestine**, known as the **duodenum**. Here, **bile** helps the body to digest fats from food, by breaking them down into tiny droplets.



Pancreas

The **pancreas** plays an important part in **digestion**. It produces pancreatic juices that contain digestive **enzymes**. These **enzymes** are released into the **duodenum** to help the body break down carbohydrates, fats and proteins from food.

The **pancreas** also produces a hormone called insulin, which helps to control blood sugar levels.



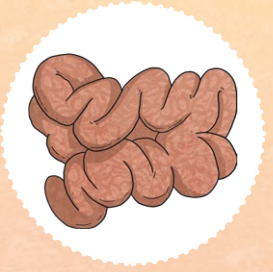
The **liver**, **pancreas** and **gall bladder** are all organs of the digestive system but food does not pass directly through them. They are involved in chemical **digestion** where **enzymes** break food into tiny particles which can be absorbed into the body.

Did You Know...
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Small Intestine

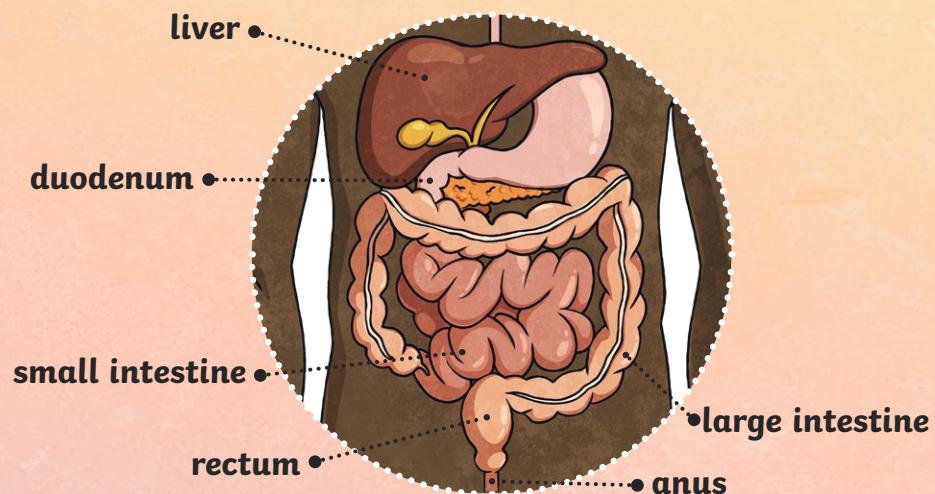
Once food has left the **stomach** in the form of **chyme**, it is released into the **small intestine**. The **small intestine** is a tangled tube around 7 metres long and 2.5 centimetres in **diameter**. If you could unravel an adult's **small intestine** and lay it out flat, it would be taller than a giraffe!



The job of the **small intestine** is to further break down food from the **stomach** and to absorb **nutrients** for use in the body. This is where most food is actually digested. The **small intestine** is made up of three parts: the **duodenum**, **jejunum** and **ileum**. Read more about these on the next page.

The **duodenum** is the special name given to the first part of the **small intestine**. Here, the food is mixed with digestive juices from the **pancreas** and **bile** from the **liver** and **gall bladder**.

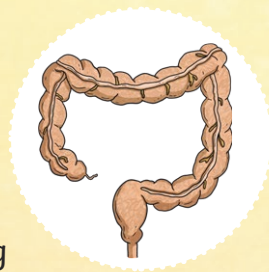
Just like in the **oesophagus**, **peristalsis** muscle movement occurs in the **small intestine** to move food along.



The middle section of your **small intestine** is called the **jejunum** and the final section (also the largest) is called the **ileum**.

The main function of these two sections is to absorb (take up) **nutrients**. To help with this, small structures shaped like fingers, called 'villi', cover the lining of the **small intestine**. Villi speed up the absorption of **nutrients** from the **chyme**. These **nutrients** then go into the bloodstream, which transports them to different parts of the body.

Large Intestine



Once food has travelled through the **small intestine**, most of the **nutrients** from it have been absorbed by the body and are travelling through the bloodstream to go where they are needed. What is left then reaches the **large intestine** (or **colon**, as it is sometimes known). The **large intestine** is around 1.5 metres long and 7.6 centimetres in **diameter**.



The functions of the **large intestine** are to absorb water and form **faeces**, otherwise known as poo. **Faeces** are made up of waste products and are stored in the **rectum**, until a person goes to the toilet. The **faeces** then exit the body through the opening at the end of the digestive system, called the **anus**.

The person is a young man with red hair and glasses, wearing a blue hoodie. He is holding a tablet computer. A large speech bubble originates from him, containing the following text:

The digestive process is complicated! To recap, **digestion** starts in the mouth. Partially digested food then travels down the **oesophagus** to the **stomach**. Here, the food is broken down further, before passing into the **small intestine**. Finally, **faeces** are formed in the **large intestine** and leave the body via the **anus**.

HEALTHY GUT

The Importance of Your Digestive System

As we've read in the previous chapters, the digestive system is very important for helping the body to get the right **nutrients** it needs from food. This helps people to have energy, stay healthy, grow and repair.

There are many steps a person can take to help keep their digestive system healthy and try to prevent problems such as stomach upsets.

Fibre

Fibre is an important **nutrient**. It lets food travel through the digestive system more easily. Fibre also helps to make **faeces** soft to prevent **constipation**.

Fibre is found in food such as wholegrain cereals, wholemeal bread, oats, beans, pulses, fruit and vegetables.



Each day, it is recommended that adults should eat 30 grams of fibre and children aged 5-11 should eat around 20 grams.

Fluids

What people drink can have a big impact on **digestion**. It is important to drink plenty of water, as this works with the fibre to keep food moving through the digestive system and also softens **faeces**.

It is advisable to try to limit drinks with caffeine (such as tea, coffee and cola) and other fizzy drinks, as these can sometimes cause heartburn and make your **stomach** feel bloated. It is recommended that a person drinks 6-8 glasses of liquid a day.



Fat is an important part of a person's diet but foods that are high in saturated fat, such as chocolate, burgers and other fried foods, take longer for the body to digest. Eating lots of these foods is more likely to cause **stomach** aches and heartburn. It is recommended to try to choose foods that have more unsaturated fat, such as oily fish, nuts, seeds and avocados.

Did You Know...
?



FOOD CHAINS

What Is a Food Chain?

A food chain is a sequence showing the links between living things and what they eat.

All living things need food to survive and animals (including humans) get energy and nutrition from eating food.

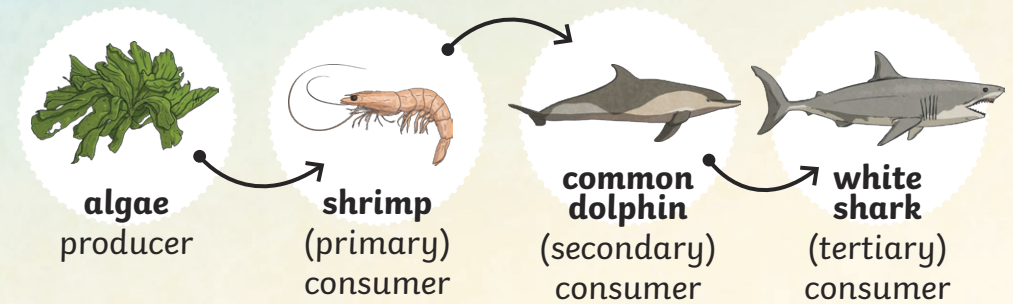
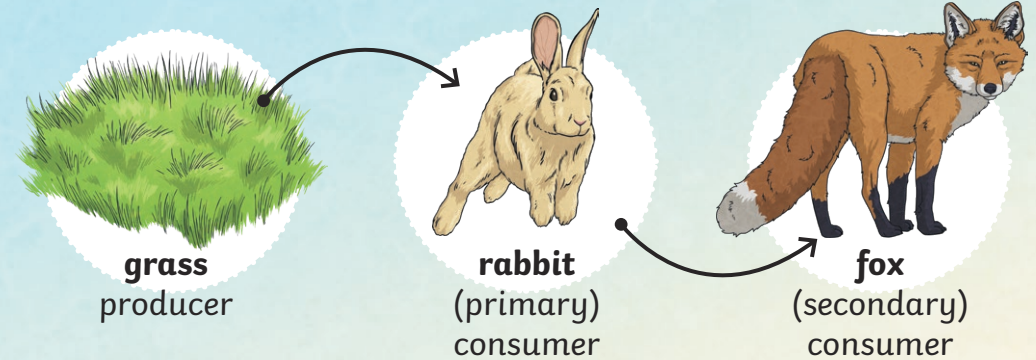
Plants are different because they make their own food. Their leaves absorb light from the sun and produce energy from this. Animals then eat the plants and these animals often become food for other animals.

For example, caterpillars eat the leaves, which gives them energy. Then, blue tits eat caterpillars.



Examples of Food Chains

Food chains are shown in diagrams with arrows to show the transfer of energy.



Plants usually form the first link in a food chain. As plants make their own food, they are known as **producers**. **Consumers** are animals that eat plants and other animals because they can't make their own food.

The first animal in the food chain that eats plants is known as the primary **consumer**. The animal that eats the primary **consumer** is called the secondary **consumer** and, in some food chains, this can lead to a tertiary **consumer**.

There are many different labels we can give the living things in a food chain. A **consumer** that is eaten by another animal is also known as **prey**. **Consumers** that hunt and eat other animals are **predators**. Some animals, like the common dolphin on the last page, can be both a **predator** and **prey**.

Animal Diets

An animal that only eats plants is called a **herbivore**. Because many parts of plants are not rich in the **nutrients** that animals need, **herbivores** often have to eat very regularly to survive. For example, impala (a type of antelope) might spend a large part of the day grazing on grasses.

impala



Carnivores are animals that eat other animals. They usually hunt and chase their **prey**. **Carnivores** get a lot of energy from their food so they can often go for a long time without eating. Lions, for example, can sometimes last for 2-3 days without food after a big kill.

lion



martial eagle



brown bear



Omnivores are animals that have a mixed diet and eat both plants and animals. For example, brown bears eat plants, nuts, berries, fish and small mammals.

Some animals eat other animals but don't catch their own **prey**. Instead, they feed on animals that **predators** have killed and left behind or animals that have died through other causes. These animals are known as **scavengers**. Vultures and hyenas are **scavengers**, although hyenas will hunt if they cannot find enough food.

lappet-faced vulture



giant African millipede

There is also another group of **organisms** that play a key part in food chains. **Decomposers** feed on dead animals, their waste products and decaying (rotting) plant material. **Decomposers**, such as earthworms, millipedes, bacteria and fungi, break down dead **organisms**, returning vital **nutrients** to the soil. These **nutrients** then help plants to grow. It's nature's very own way of recycling energy!

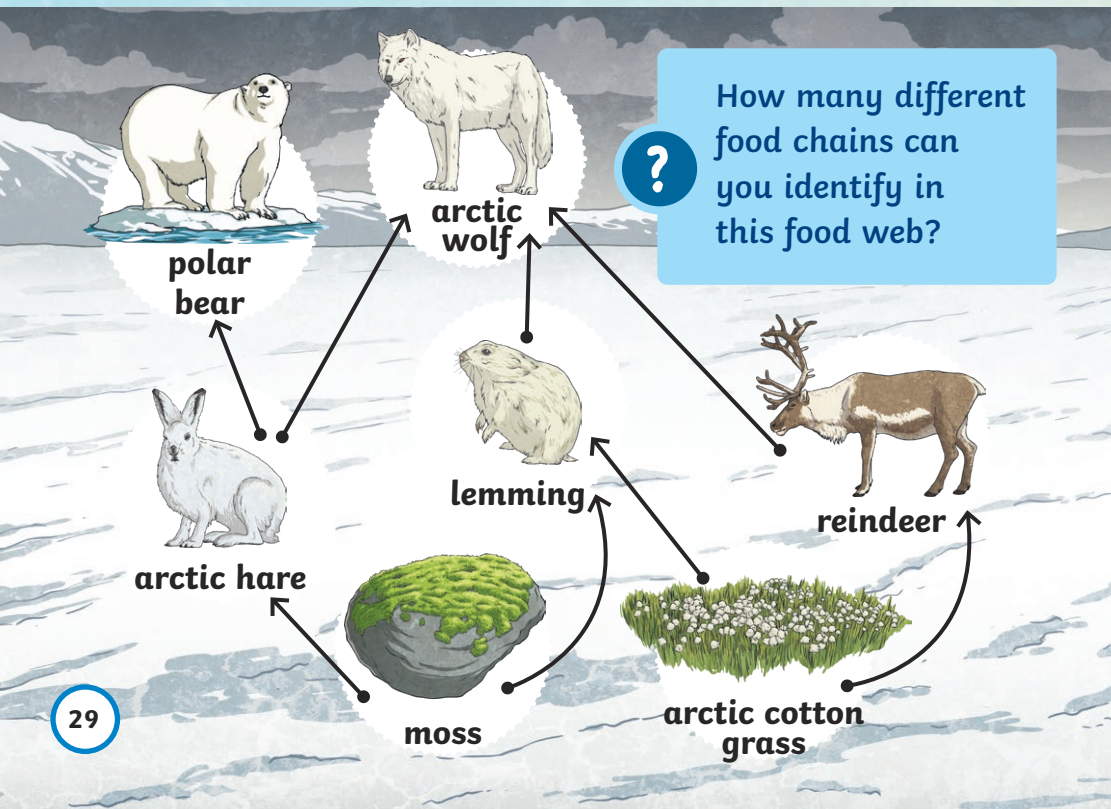
Did You Know...
?



Food Webs and Ecosystems

Different habitats have many different food chains within them. Some animals may also eat the same food. For example, in a polar habitat like the Arctic, there are several different food chains linked by the same animals. The Arctic hare is **prey** for both Arctic wolves and polar bears.

When food chains join up or overlap like this, we can show them using a **food web**. A **food web** shows all the links that make up an ecosystem (a geographical area with all its interacting living and non-living parts). This is a simplified food web for an Arctic ecosystem.

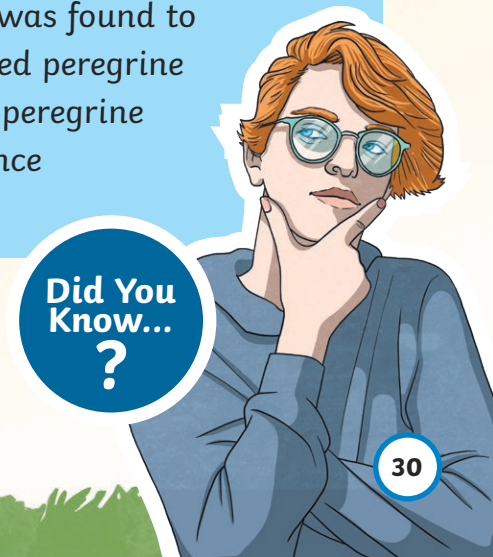


Can Food Chains Change?

Every link in a food chain is important as animals higher up the chain rely on the links lower down. Polar bears don't eat moss but if all the moss died out, the Arctic hares would have less food and so may not survive. This would mean the polar bears would have to find other food.

When one link in a food chain changes, this can have a huge impact on the other links and all the living things in the ecosystem.

Humans can disrupt food chains. In the 1960s, a pesticide called DDT was sprayed on crops to prevent insects from damaging them. Smaller birds (like pigeons) ate these crops and when predators such as peregrine falcons ate the pigeons, the chemicals travelled up the food chain. DDT was found to be poisonous to wildlife and caused peregrine falcons' eggs not to hatch, so the peregrine falcons became rarer. DDT has since been banned.



Did You Know...
?

Answers: 1. moss - hare - wolf 2. moss - hare - polar bear 3. moss - lemming - wolf 4. cotton grass - lemming - wolf 5. cotton grass - reindeer - polar bear

ANIMAL TEETH

A variety of teeth can be found in different animals. You can often tell what kind of food an animal eats by looking at its teeth.

Why Do Animals Have Different Teeth?

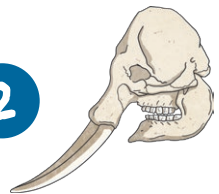
In the previous chapter, we learnt about the different diets that animals have. Animals that are **herbivores** (such as horses and sheep) eat plants and will need very different teeth to those that are **carnivores** and eat meat (such as lions and wolves).

? Can you guess which teeth belong to which animal?

1



2



3



A



B



C



Carnivore Teeth

grey wolf



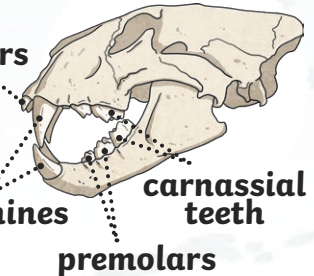
Carnivores have sharp teeth for cutting through meat and pointed **canines** for holding and gripping their **prey** tightly. You can see these clearly in some animals, such as tigers, lions and wolves.

incisors

canines

carnassial teeth

premolars



Most carnivores have special teeth called **carnassial teeth** which are designed to shear and slice through meat. They are found in animals like big cats, hyenas, dogs and weasels. Many **carnivores** do not have **molars** because they swallow chunks of meat, rather than grinding up their food.

Herbivore Teeth

Herbivores have lots of wide, flat teeth (**premolars** and **molars**) for chewing and grinding plants. They often have long sharp **incisors** too, which tear off plants. Many herbivores do not have **canines**.

Answers: 1. tiger,
2. elephant, 3. rhino

In this photo of a horse's teeth, you can see the sharp, chisel-shaped incisors at the front, which it uses to cut through grass. The flat **premolars** and **molars** at the back grind it up and break it down.



Modified Teeth

Some **herbivores** have modified teeth, which are teeth that are no longer used just for feeding. Many animals, such as elephants, walruses and warthogs, have tusks that have formed from **incisors**.

Elephant tusks have deep roots and are made of the same strong material as teeth – **enamel** and dentine. Elephants

African elephant



Asian elephant

use their tusks to dig, lift objects, forage for food and defend themselves. Male and female African elephants both have tusks, whereas in Asian elephants, only some males do.

walrus



common warthog

Omnivore Teeth

As omnivores eat a varied diet, they have a mixture of different teeth (**canines**, **incisors** and **molars**) just like humans do. Over millions of years, omnivores have developed specialised teeth depending on their diet. For example, rodents are omnivores but mainly eat plants and therefore don't have any **canines**.

Animal Tooth Care

Animals don't usually develop **tooth decay** like humans can. This is because they eat raw food and their diets are not high in sugar and acids.

Many animals also spend a lot of time chewing rough plant material, such as sticks, grass and bark, which act as natural toothbrushes to keep their teeth clean after eating.

Domestic animals (tame animals kept by humans), such as cats and dogs, can develop gum disease and **tooth decay**, so it is important that their owners take them to regular vet visits to help take care of their pet's teeth.

eastern gorilla



grey reef shark



Sharks may have over 30,000 teeth in their lifetime! Sharks do not have baby (milk) teeth and adult teeth like humans do. Instead, they have rows of teeth that can continually regrow to replace any teeth that fall out. Their teeth are not very strong and so on average, sharks lose at least one tooth a week.

Did You Know...
?



Weird and Wonderful Animal Teeth

Sawfish

Despite looking like sharks, sawfish are rays. They have a long snout called a 'rostrum' which looks a bit like a saw and is lined with teeth. The rostrum has sensory organs which locate **prey** (such as fish and crustaceans) via electrical signals. They can slash their rostrum side to side to stun and kill **prey**, use it to dig for **prey** and as a defence against **predators**.

largetooth sawfish



Narwhals

Narwhals are found in Arctic waters and are a very unusual-looking animal. They have a spiral tusk which is an enlarged tooth. It is mostly found on males, although some females have a small tusk. Some males even have two! The purpose of this tusk has puzzled scientists. Theories include that it is used for breaking ice, duelling, stunning fish, attracting females and detecting the environment. Recently, it has been found that their tusks are very sensitive and contain up to 10 million nerve endings.



narwhal

Eurasian beaver

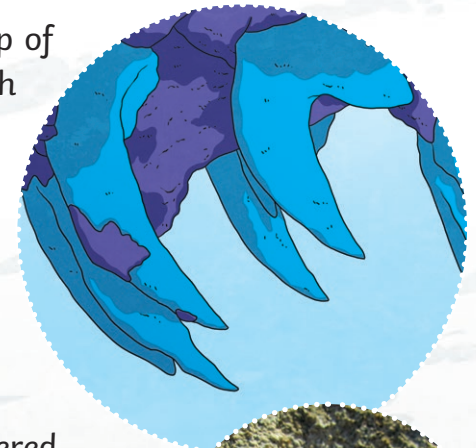
Beavers

Beavers are herbivores and have distinctive orange **incisors**. This is due to the **enamel** on the outside of the tooth being rich in iron. These sharp **incisors** never stop growing but beavers gnaw on wood to keep their teeth from becoming too long. The trees they gnaw down provide material for building their dams and lodges and act as a source of food.



Limpets

Limpets are a mollusc (a group of animals with soft bodies which often have a shell) and they live on rocky shores. When the tide is out, limpets stick to rocks. When it comes in, they move about to feed on algae. To help with this, they have a tongue-like structure called a 'radula', which is covered in teeth. It scrapes across the surface of the rock to allow the limpet to feed. Scientists have discovered that limpet teeth are currently the strongest biological material ever tested – stronger than even spider silk!



limpets

DIGESTION IN OTHER ANIMALS

Many animals have a complete digestive system that is similar to humans, which starts at the mouth and finishes at the **anus**. However, some animals have different digestive systems to help them get the **nutrients** they need to survive.

Ruminants southern giraffe

Ruminants are a group of grazing herbivores with hooves. They include cows, sheep, goats, deer, llamas, camels and giraffes.

Ruminants have a much larger **stomach** than humans, which is split into four chambers and helps them to digest tough plant material. These four chambers allow the animal to 'chew' their food more than once.



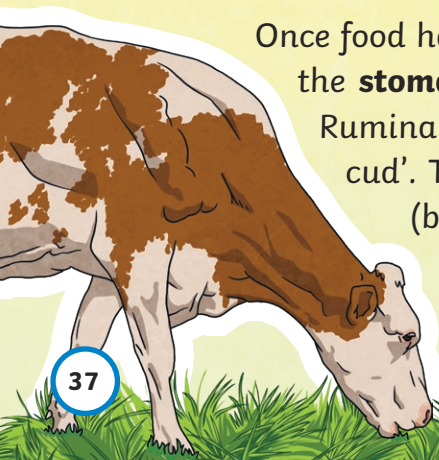
southern giraffe



red deer

Once food has passed into the second chamber of the **stomach**, it forms into balls called 'cuds'.

Ruminants spend a lot of time 'chewing the cud'. This is where the food is regurgitated (brought back up to the mouth) and chewed again to break it down further.



Birds

Birds do not have teeth like mammals and so cannot chew their food. Instead, it enters through their beak and then drops down their throat. Some birds, such as pigeons, store food in a special pouch in their throat called a **crop**.

redstart



blue tit

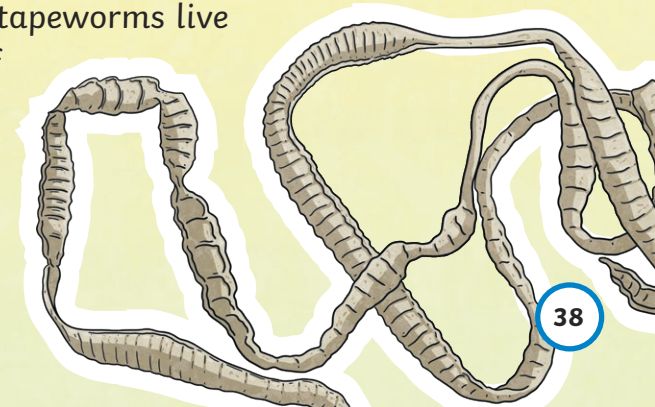
When birds are ready to digest their food, it travels to their **stomach** where it is mixed with digestive juices, similar to **digestion** in humans. It then reaches the second part of their **stomach** (called a **gizzard**) where it is ground up into small pieces. Certain birds even swallow stones to help with grinding up their food.



yellow-crowned night heron

Flatworms

Flatworms are a special group of animals that do not have their own true digestive system! They are parasites, which means they survive by living on or in other animals. For example, tapeworms live inside the **intestines** of other animals and feed off **nutrients** that the animal has already digested.



QUIZ

Here's an opportunity to see how well you remember the interesting information you have read in this eBook. Try to answer the following questions without looking back!

1. Can you name the four different types of teeth that can be found in humans?
2. What is the recommended amount of time to brush your teeth for?
3. What is the hardest material in the human body?
4. What is the function of the gall bladder?
5. How long does it take for food to travel through your oesophagus and reach your stomach?
6. What is peristalsis?
7. Which term is used to describe plants in a food chain?
8. Can you name an organism that is a decomposer?

9. What is a food web?
10. Why do some animals have carnassial teeth?
11. Which animal has teeth made from a material stronger than spider silk?
12. How many chambers does a ruminant have in its stomach?



Answers: 1. Canines, incisors, premolars and molars (wisdom teeth are a special type of molar) 2. Two minutes, at least twice a day 3. Enamel 4. It stores bile from the liver and releases it into the small intestine. 5. Approximately 10 seconds 6. It is muscle movement in your oesophagus and intestines which pushes food along. 7. Producers 8. Example answers include earthworms, millipedes, bacteria or fungi 9. A food web joins several food chains together and shows all the links that make up an ecosystem. 10. Carnivores (such as big cats, hyenas, dogs and weasels) have carnassial teeth to shear and slice through meat. 11. Limpets 12. Four

GLOSSARY

Aa

anus the opening at the end of the digestive system where **faeces** are released from the body

Bb

bile a green liquid produced by the **liver** that the body uses to break down fats in food

bolus a small, round ball of chewed food and **saliva** that travels down the **oesophagus** to the **stomach**

Cc

canines sharp and pointy teeth that tear and rip

carnassial teeth teeth found in some carnivores (such as big cats, hyenas, dogs and weasels) that are designed to shear and slice through meat

GLOSSARY

chyme a thick liquid containing partly digested food and gastric juices which passes from the **stomach** to the **small intestine**

colon a term referring to the main part of the **large intestine**

constipation difficulty in emptying the **rectum**, usually due to hardened **faeces**

consumer an animal that eats plants and/or other animals

crop a special pouch in the throat of some birds, such as pigeons, that is used to store food

Dd

diameter a straight line that passes from side to side through the middle of a circle

digestion the process of breaking down food so the **nutrients** in it can be used by the body



decomposer an **organism** that breaks down dead animals, their waste products and rotting plant material to return **nutrients** to the soil – see also **detritivore**

detritivore an **organism** that eats dead plants and animals – see also **decomposer**

duodenum the first part of the **small intestine** which uses **enzymes** and **bile** to break down food

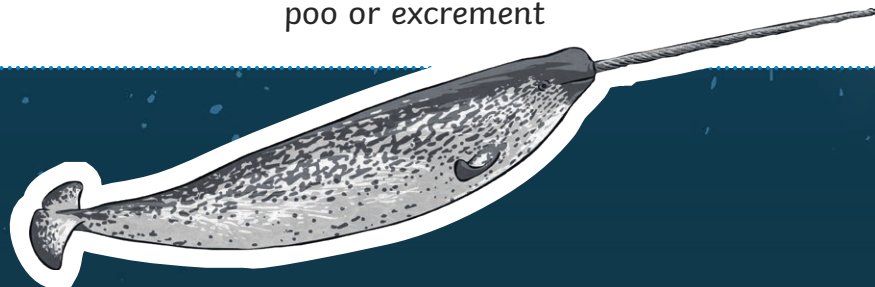
Ee

enamel the very hard material that covers a tooth and protects the inside

enzymes special substances in the body that help to speed up chemical reactions

Ff

faeces waste that remains after food has been digested, otherwise known as poo or excrement



Gg

gall bladder an organ that stores **bile** from the **liver** and releases it into the **small intestine**

gizzard a muscular part of the **stomach** of some birds, used for grinding up food

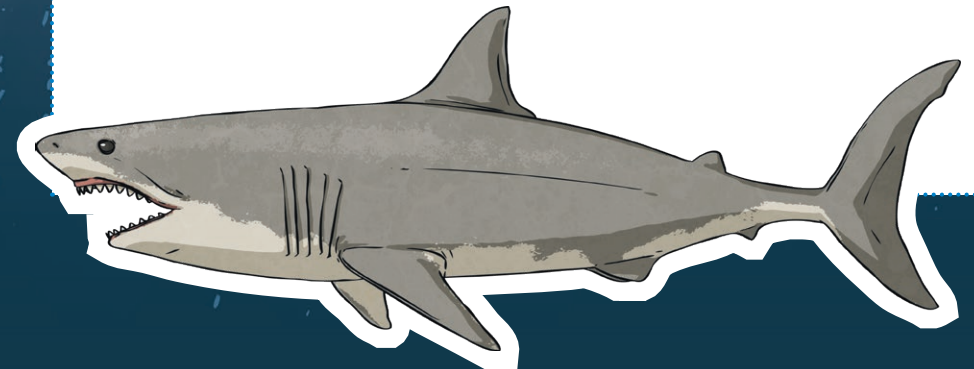
Ii

ileum the final (and largest) part of the **small intestine** that absorbs **nutrients** from digested food

incisors chisel-shaped teeth with a sharp, straight edge to cut and chop food

Jj

jejunum the middle part of the **small intestine** between the **duodenum** and the **ileum**



Ll

large intestine a short, wide tube forming part of the digestive system which absorbs water from digested food and forms **faeces**

liver an organ that processes **nutrients** and produces **bile**, which breaks down fat

Mn

molars wide teeth that have several cusps and are used to grind food

mucus a slimy substance that can protect parts of the digestive system, such as the **stomach**

Nn

nutrients substances that living things need to survive and be healthy

Oo

oesophagus a long muscular tube forming part of the digestive system which transports food from the mouth to the **stomach**

organism any living thing, such as an individual animal, plant or bacteria

Pp

pancreas an organ that produces digestive **enzymes** and releases them into the **duodenum**

peristalsis muscle movement in the wall of the **oesophagus** and **intestines** that pushes food along

plaque a thin coating found on teeth that contains bacteria and can build up to cause **tooth decay** and gum disease

predator an animal that hunts and eats other animals

premolars wide teeth with two cusps that crush and grind food and are only found in adults

prey an animal that is hunted and eaten by other animals



producer an **organism** that produces its own food (such as plants) and forms the first link in a food chain

Rr

rectum the final part of the **large intestine** which stores **faeces**

Ss

saliva a watery liquid produced in the mouth that helps to start breaking down food and aids in swallowing, otherwise known as spit

salivary glands produce **saliva**, which moistens food and helps with swallowing

scavenger an animal that doesn't kill its own **prey** but feeds on animals that **predators** have killed or that have died of natural causes

small intestine a long, narrow tube forming part of the digestive system which breaks down food from the

stomach, absorbs **nutrients** and releases them into the body

stomach

an organ that holds food and breaks it down with acids and **enzymes**

Tt

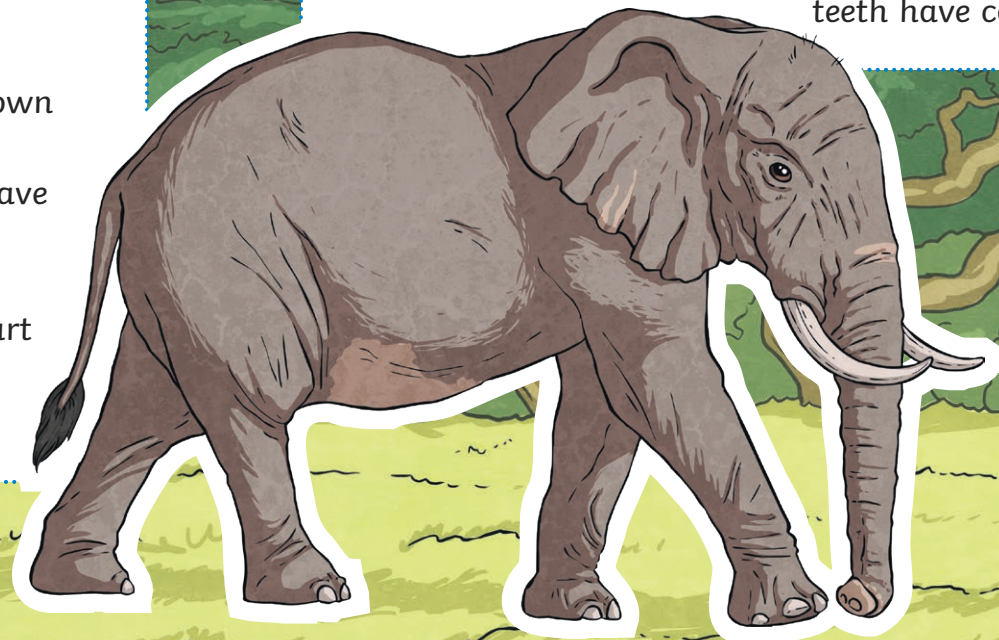
tooth decay

damage that occurs to teeth when **plaque** builds up and turns sugars into acid

Ww

wisdom teeth

extra **molar** teeth that some people get, usually by their early 20s, several years after all of their adult teeth have come through

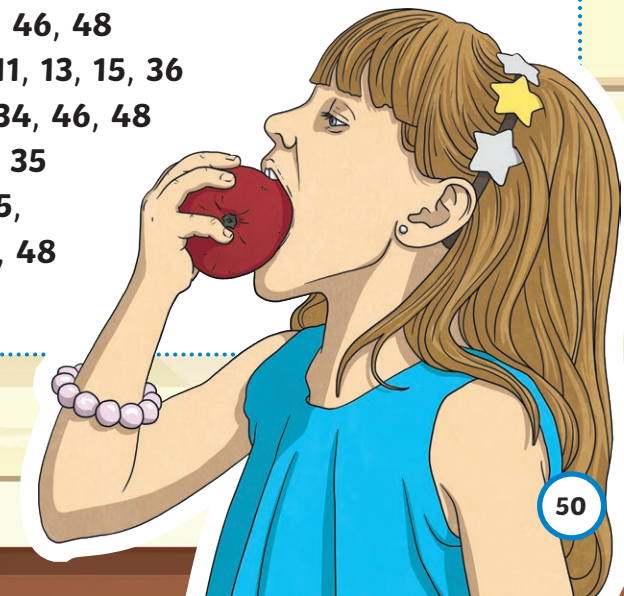


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