

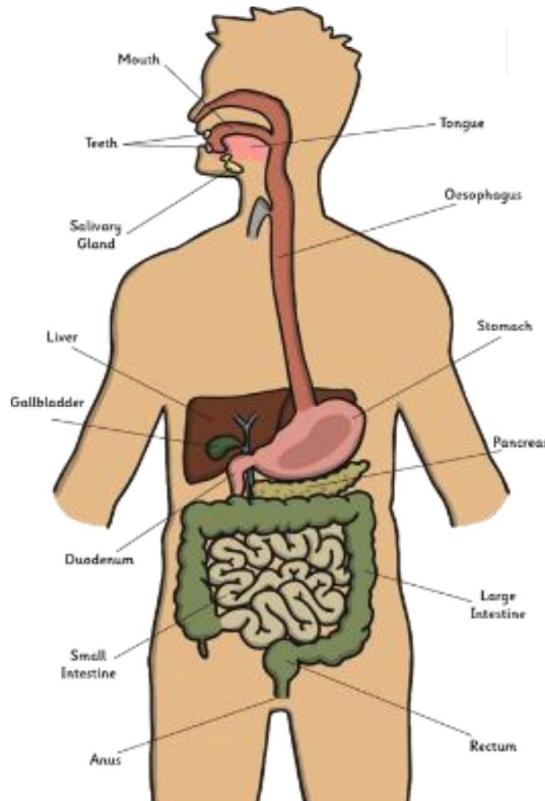
Science

Food and Digestion



Atlantic Academy Portland
an Aspirations Academy

The Human Digestive System



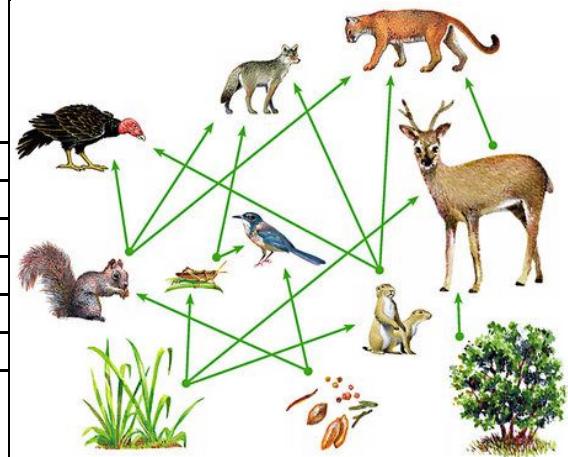
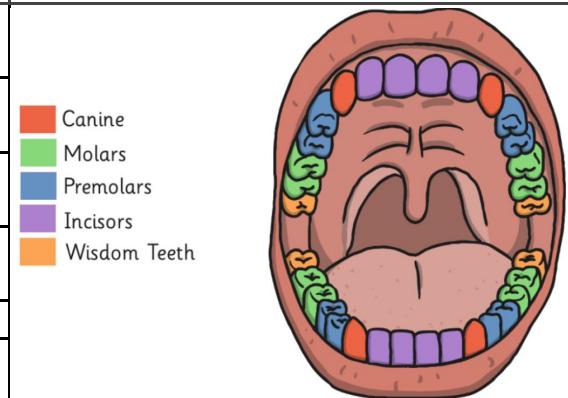
Year 4 - Spring 2

Name: _____

Class: _____

Year 4 Science Knowledge Organiser - Spring 2 - Food and Digestion

1	Digestive system	This is designed to extract the goodness from food and get rid of the leftovers.	<p>The Human Digestive System</p>
2	Nutrition	The substances that you take into your body as food and the way that they influence your health.	
3	Muscle	One of many tissues in the body that can tighten and relax to produce movement.	
4	Stomach	An organ in the body where food is digested.	
5	Intestine	A long tube through which food travels from the stomach and out of the body while it is being digested.	
6	Oesophagus	The tube in the body that takes food from the mouth to the stomach.	
7	Saliva	Saliva is mostly made of water and it helps you to chew, taste and swallow food. It contains enzymes which start to break down the food we eat.	
8	Enzymes	Special molecules in the body which act to create a chemical reaction. In the digestive system the reaction they produce breaks down food.	
9	Incisor	Eight teeth at the front of the mouth which have a straight, sharp edge and help cut up the food.	
10	Premolars	Eight teeth behind the canines and are lower and bumpy and help to grind food.	
11	Canines	Four teeth which are tall and pointed and are used to hold and tear food.	
12	Molars	Twelve molars at the back of the mouth are big, flat teeth that also help to grind and chew.	
13	Enamel	Yellowish-white hard material covering a tooth.	
14	Tooth decay	When bacteria in the mouth begin to eat away at teeth.	
15	Food chain	Shows how the lives of organisms are linked in natural communities made up of a series of organisms that eat each other. Shows how energy is transferred from one organism to another via food.	
16	Herbivores	An animal that eats only plants	
17	Omnivore	An animal that eats both plants and meat.	
18	Carnivores	An animal that eats meat.	
19	Consumer	Animals that eat plants in a food chain.	
20	Producer	Plants in a food chain.	
21	Predators	An animal that hunts, kills, and eats other animals.	
22	Prey	An animal that is hunted and killed by another for food.	



LESSON ONE: Digestive System Parts

Retrieval Practice

What I already know about food	Questions I still have about food.
<ul style="list-style-type: none"> • • • • 	<ul style="list-style-type: none"> • • • •

Outcomes	Key Vocabulary
To describe the simple functions of the basic parts of the digestive system in humans in the context of identifying the parts of the digestive system.	Mouth, tongue, teeth, oesophagus, stomach, duodenum, small intestine, large intestine, pancreas, liver, rectum, anus, salivary glands, gallbladder, digestion, digest, digestive system.
Knowledge needed	
It will be helpful if children have an understanding of the human need for nutrition.	

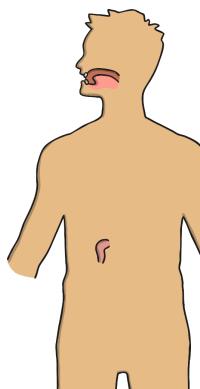
Everybody Reads

Humans digest food. They have a digestive system that allows them to do this.
What do you think digest/digestive system mean?

Definition of **digest** - Break down food so it can be used by the body.

Definition of **digestive system** - System of organs that get food in and out of the body and which make use of the food to keep the body healthy.

Group task



You are now going to draw around a member of your group and label the body parts that you think are part of the digestive system! **REMEMBER to use the key vocabulary to help you.**

Think about the following to help you:

How do humans digest food?

How does food travel through the body?

What parts of the body are involved?

(Hint: it's not just the ones on the outside that you can see!)

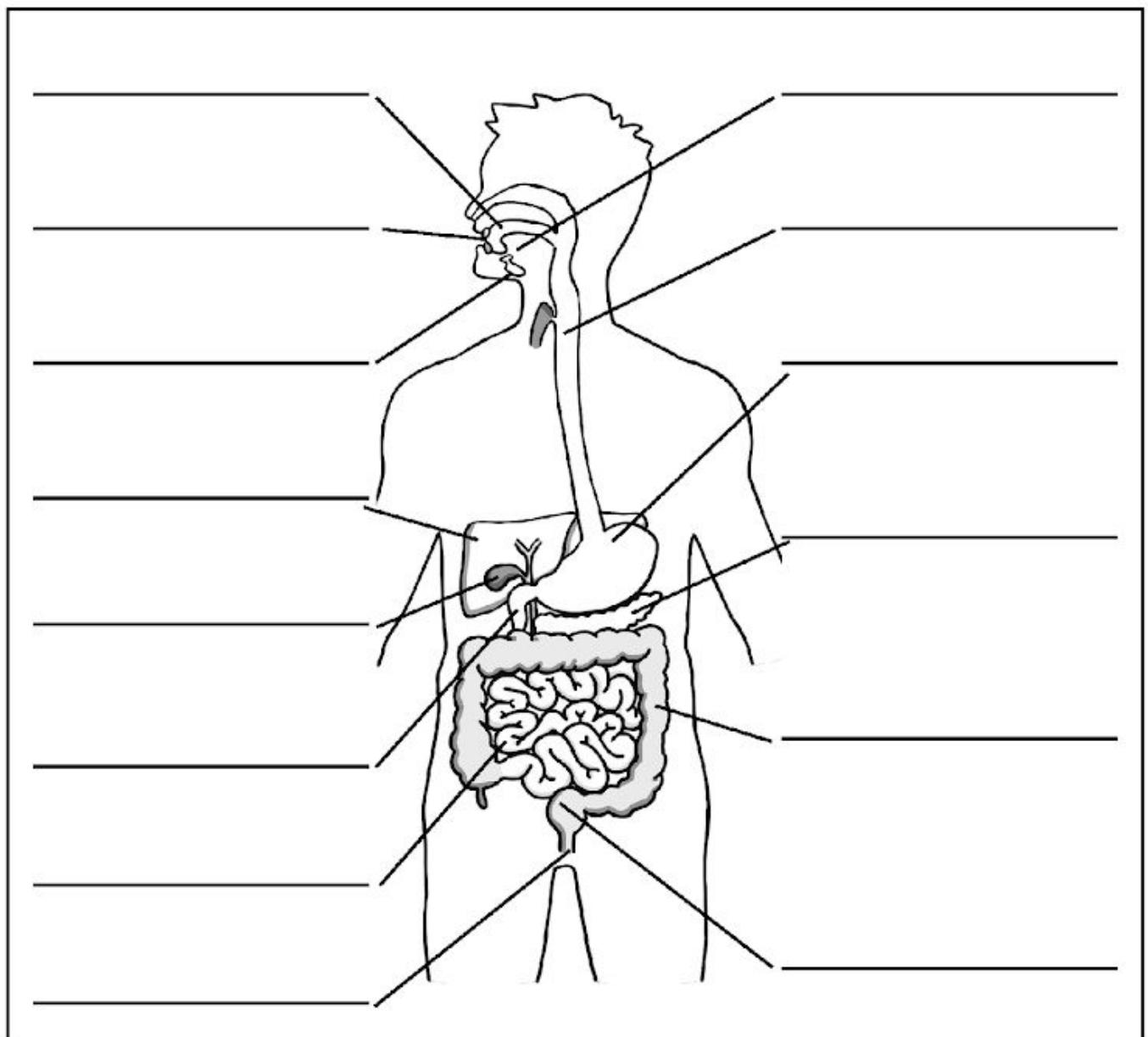
Look at the picture on the board and check your answers! How many did you get right?

Independent Task

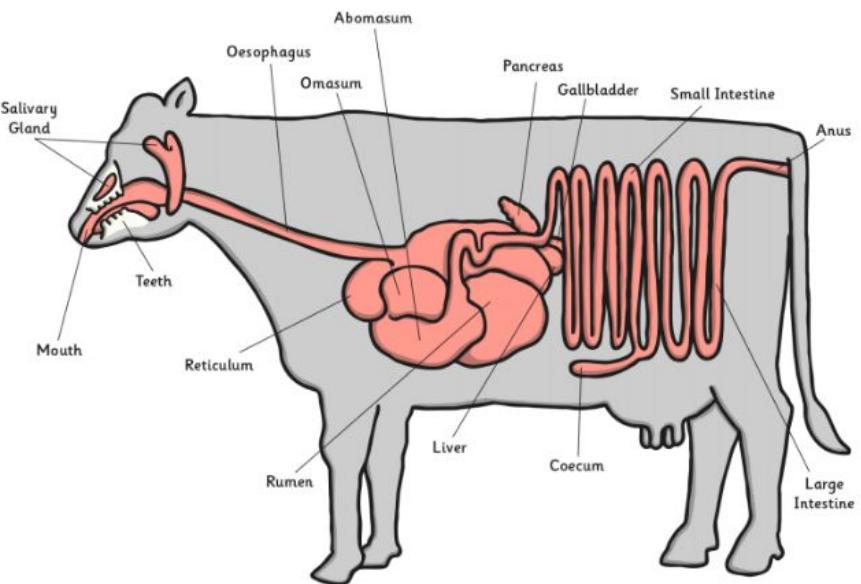
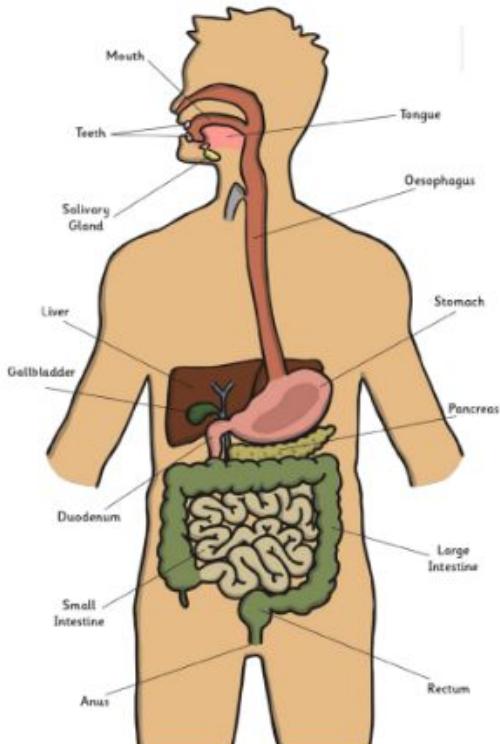
Now you have seen the answers, mark-up this picture of the digestive system.

Use these keywords to help you.

mouth	tongue	teeth	salivary glands	oesophagus	stomach	duodenum
small intestine	large intestine	gallbladder	pancreas	liver	rectum	anus



Exit Task



Note: The Omasum, Abomasum, Reticulum and Rumen are the names of the cow's stomachs.

Use the pictures to help you to complete the following table;

Similar Parts of the Digestive System	Different Parts of the Digestive System

Exit ticket

Health and digestion

(a) Josh is finding out about the digestive system.

Tick ONE box to show why we need a digestive system.



Tick one.

To control how the body moves.	<input type="checkbox"/>	To give support to the body.	<input type="checkbox"/>
To break down food for the body to absorb.	<input type="checkbox"/>	To transport blood around the body.	<input type="checkbox"/>

1 mark

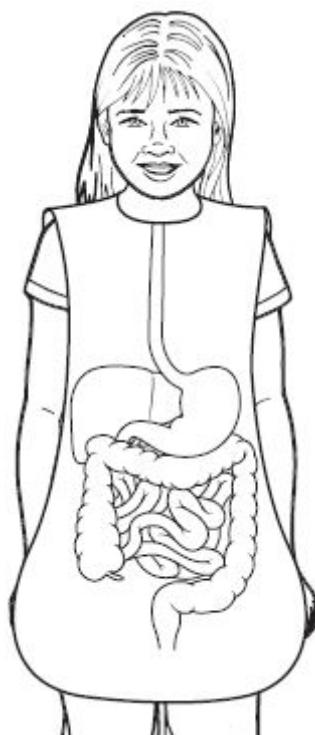
- (b) Josh has some cards labelled with parts of the digestive system.
Write 1 to 5 to show the correct path through the parts of the digestive system. The first one has been done for you.



mouth		large intestine		oesophagus
1				
	small intestine		stomach	

1 mark

- (c) The girl below is wearing an apron to show parts of the digestive system.
Draw an X to show the part that is the stomach.



1 mark

- (d) Complete the sentences below by writing the correct words on the answer lines.

Water and nutrients pass from the small intestine into the

They are then transported around the body by the system.

1 mark

- (e) To keep our bodies functioning well we need to eat a balanced diet.
Another way to keep healthy is by exercising.

Give TWO ways in which exercise can help keep our bodies functioning well.



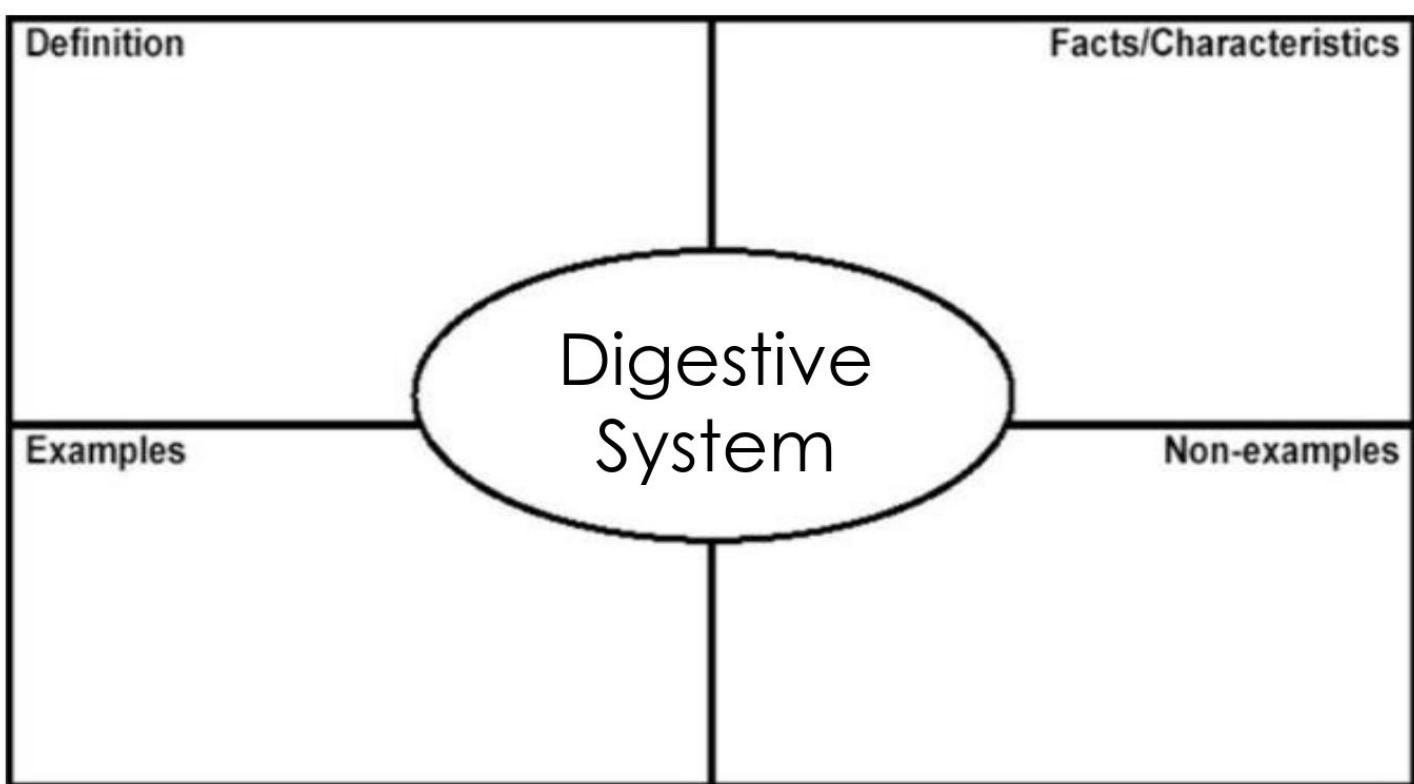
1.

2.

1 mark

LESSON TWO: Digestive System Functions

Retrieval practice



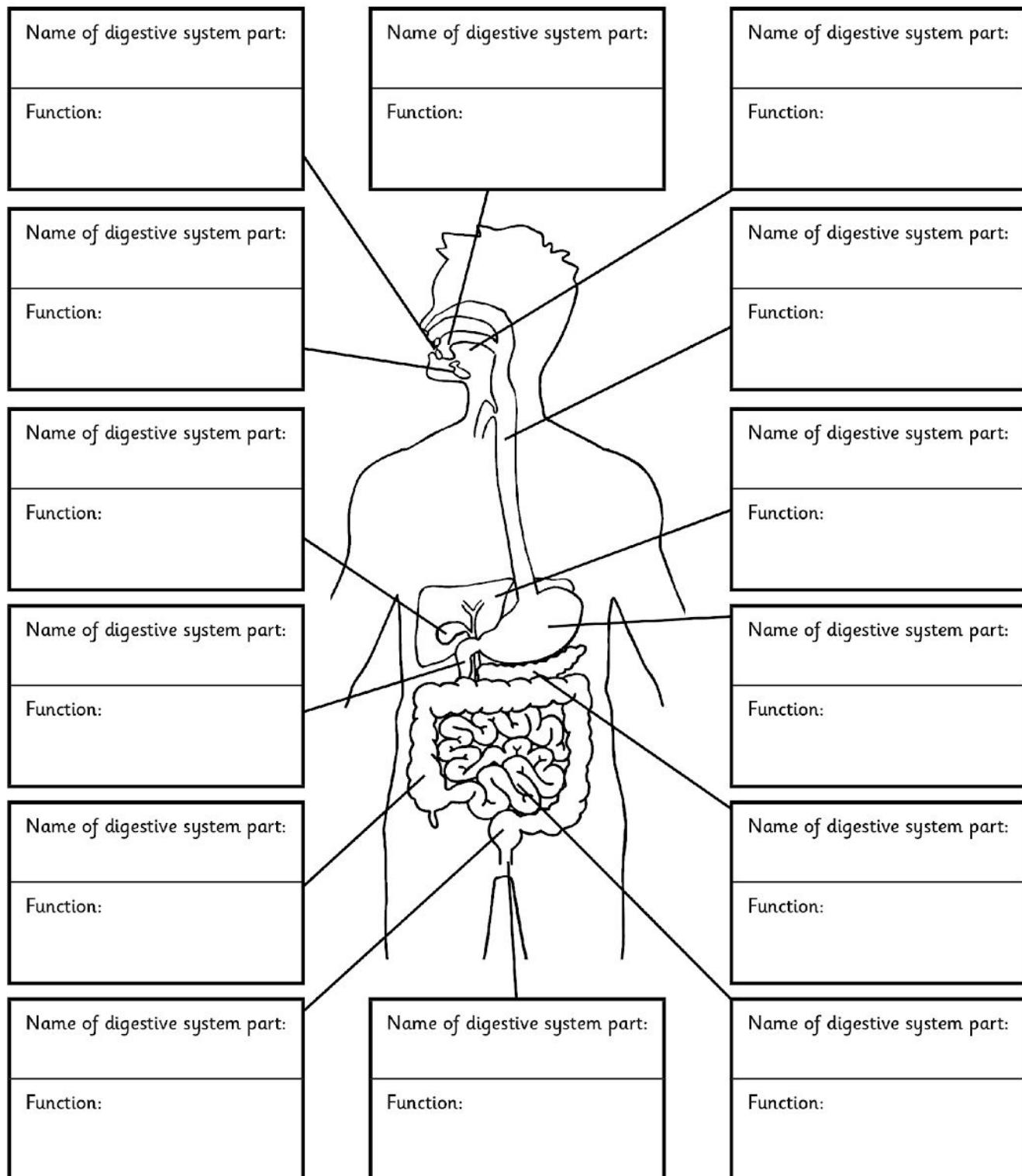
Outcomes	Key Vocabulary
To describe the simple functions of the basic parts of the digestive system in humans by explaining the functions of the different parts of the digestive system. To use straightforward scientific evidence to answer questions by reading an explanation text and answering questions.	Mouth, tongue, teeth, oesophagus, stomach, duodenum, small intestine, large intestine, pancreas, liver, gallbladder, rectum, anus, salivary glands, digestion, digest, digestive system, functions, glands, enzymes, acid.
Knowledge needed	
Children will have learnt about the parts of the digestive system in Lesson 1.	

Talk Task

How do the different parts of the digestive system work?

How do they help humans to digest food?

Discuss with your group and write down ideas next to the part on your sheet.



Everybody Reads

Glands - You will come across the word glands in this lesson so we should find out what they are!

- Glands are organs that release fluids to be used in the body.
- Tear glands produce tears.
- Sweat glands produce sweat.

Enzymes - Similarly, you will come across the term enzymes.

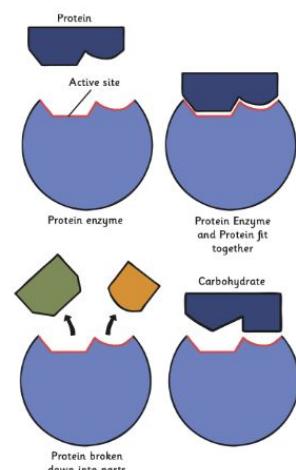
Enzymes are special molecules in the body (molecules make up cells, which make up tissue, glands, organs, etc).

They act to create a chemical reaction.

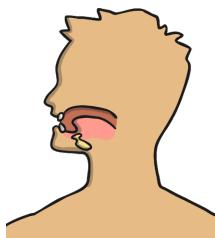
In the digestive system the reaction they produce breaks down food.

There are lots of different types of enzymes as a type of enzyme can only do one thing – so enzymes that break down protein can not also break down carbohydrates. You need different enzyme for that!

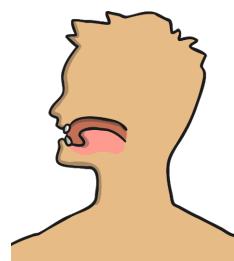
They are often thought of as a lock – only the right key will fit!



Function of parts



Salivary Glands - First part of the digestion process starts without you even eating! The smell of food triggers the salivary glands to produce saliva (some call it your mouth watering). The amount of saliva increases as you taste the food. Saliva is mostly made of water and it helps you to chew, taste and swallow food. Contains enzymes which start to break down the food we eat.

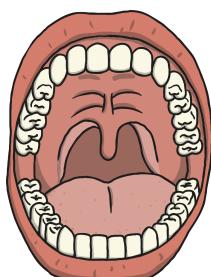


Mouth - Entry point for food.

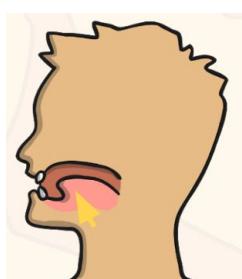
Where saliva mixes with food.

Location of tongue and teeth.

Top part of the mouth (soft palate) helps move food along to the oesophagus.



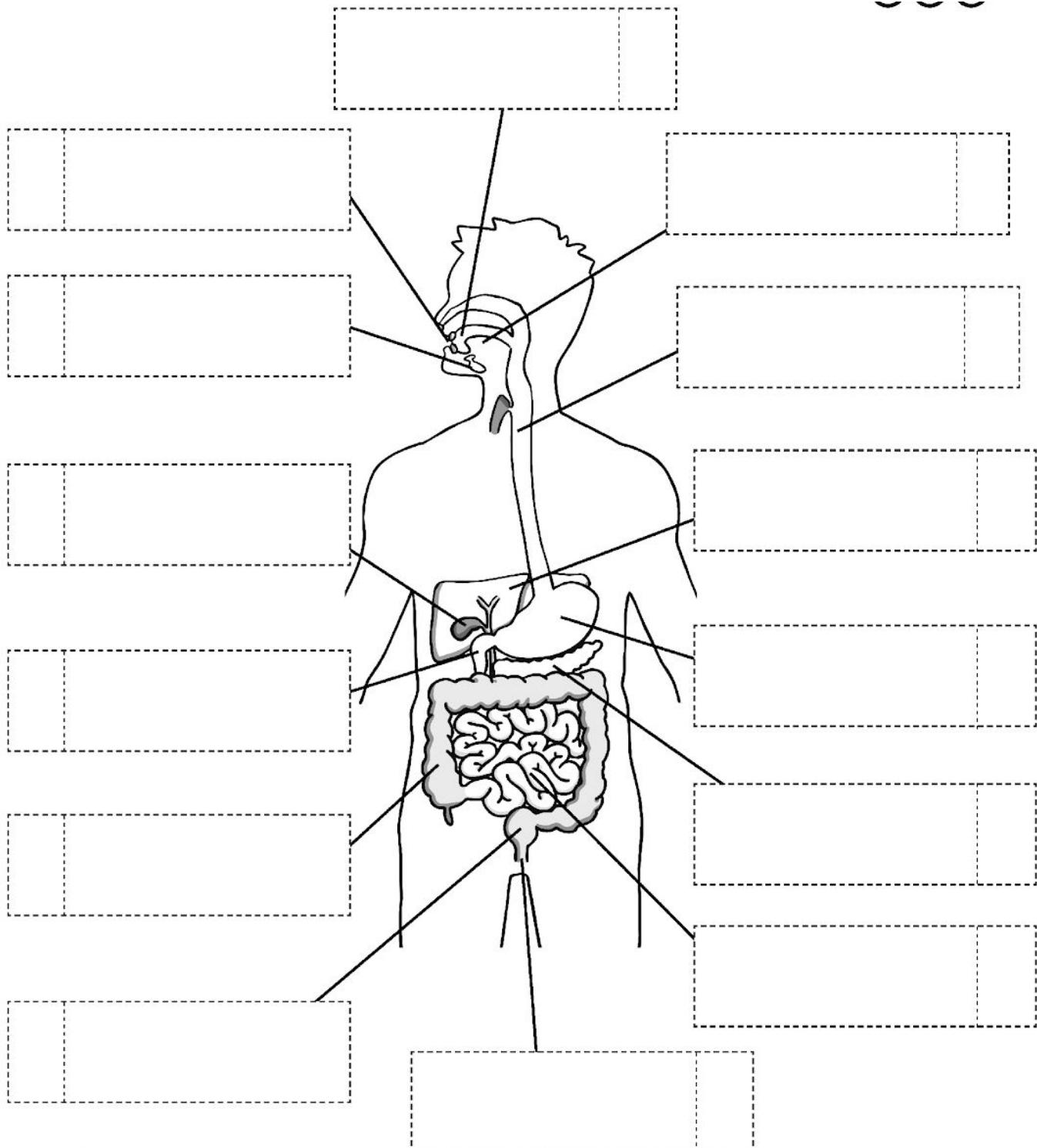
Teeth - Tear, cut and grind food into smaller pieces.



Tongue - Helps mix the food and saliva.

Independent Task

Write the names of the body parts used in digestion. Cut out the functions strips and use the tabs to stick them to the correct part.



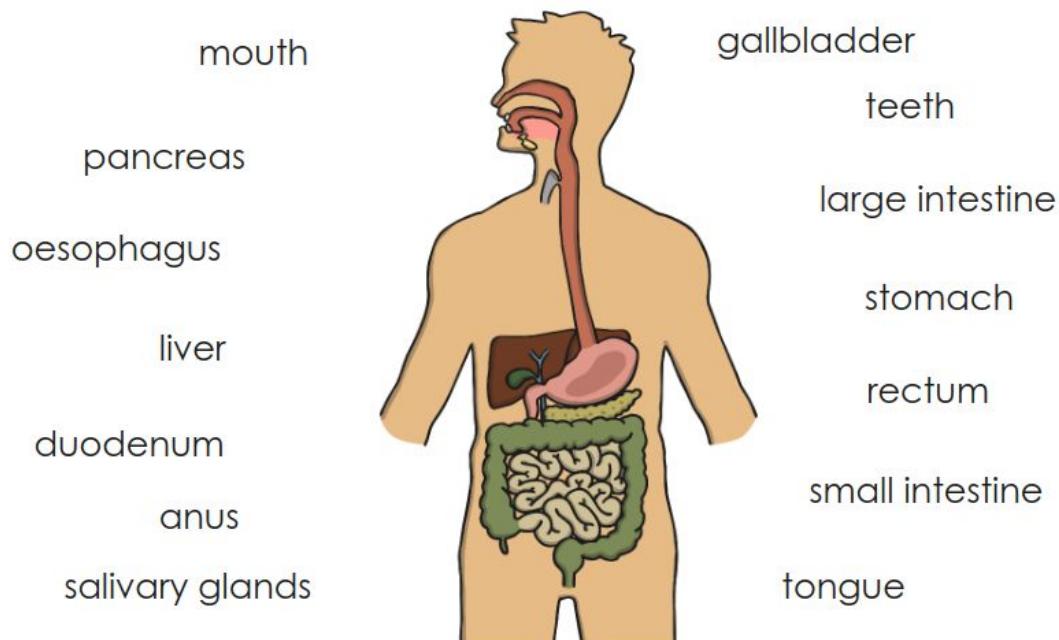
Exit Ticket

Can you answer the questions about the digestive system? Get ready to write the correct answer on your whiteboard. After 1, 2, 3... Show me!

LESSON THREE: Types and functions of teeth

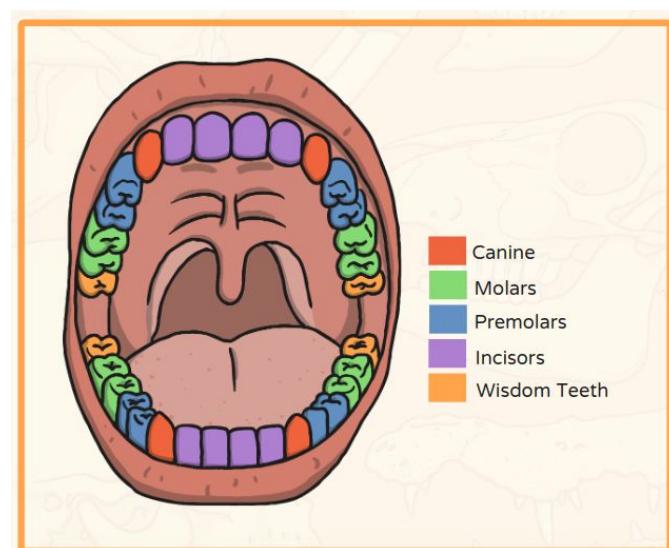
Retrieval practice

Label the parts of the digestive system - How many can you remember without looking back?

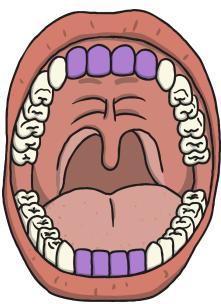


Outcomes	Key Vocabulary
To identify the different types of teeth in humans and their simple functions by learning about different types of teeth. To identify differences, similarities or changes related to simple scientific ideas and processes by comparing human and animal teeth.	Teeth, incisors, canines, molars, premolars, humans, animals.
Knowledge needed	
It will be helpful if children have learnt the difference between carnivores, herbivores and omnivores.	

Talk Task

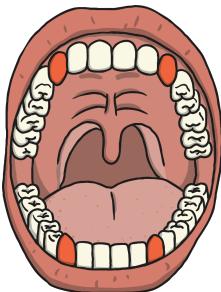


Discuss the following questions with your talk partner:
 Why do we have different types of teeth?
 What is their purpose?



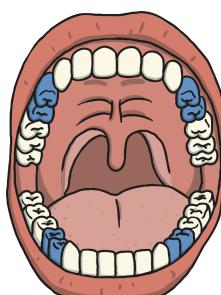
Incisors

- Humans have 8 incisors altogether; 4 in the upper jaw and 4 in the lower jaw.
- Incisors are shovel-shaped.
- Used for biting and cutting food.



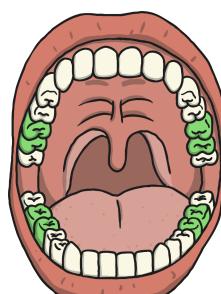
Canines

- Humans have 4 canine teeth, one in each quarter of the mouth, on either side of the incisors.
- Canines are pointy.
- Used for tearing and ripping food.



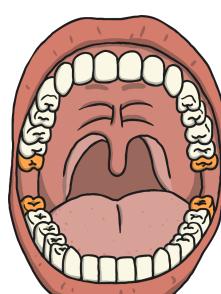
Premolars

- Humans have 8 premolars, two in each quarter of the mouth. They are between the canine tooth and the molars.
- Small and flat
- Holding and crushing food.



Molars

- Humans have 8 molars, two in each quarter of the mouth. They are at the back of the mouth behind the premolars.
- Large and flat
- Grinding food



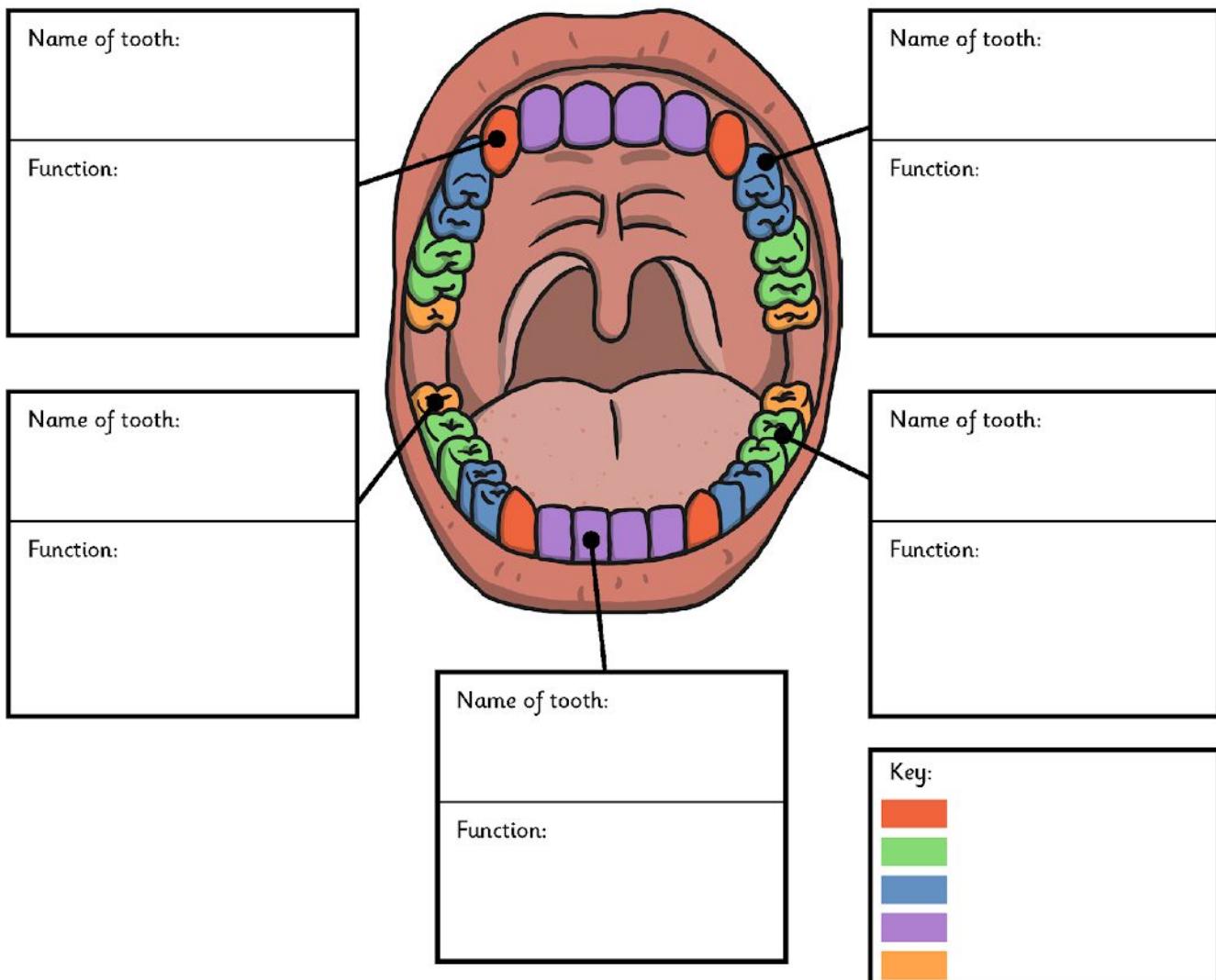
Wisdom Teeth

- Humans can have up to 4 wisdom teeth, although not everyone has them. There is 1 in each quarter of the mouth behind the molars.
- Large and flat (they are just a third molar)
- Does not have one now! Some scientists think that human ancestors needed a third molar to help grind down plant tissue from thicker leaves when humans still ate them. Since the diet of humans has changed we don't need them.

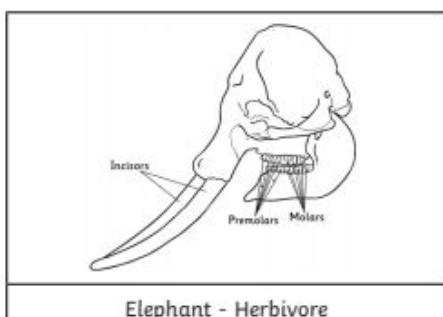
As the human diet changed our mouths have become smaller. This is the reason why many people have their wisdom teeth extracted – taken out – as there is no real room for a wisdom tooth so it tends to grow inward and can become a problem.

Independent Task

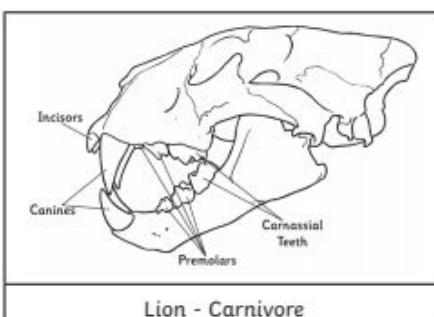
Look at the picture and complete the key below. Then label the types of teeth and write their function underneath.



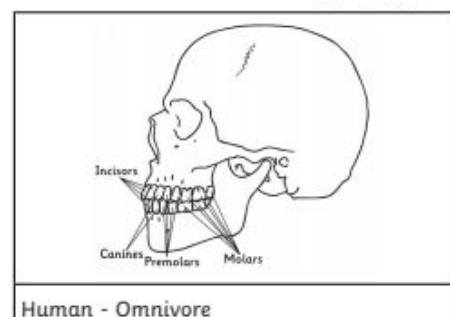
Extension Task



Elephant - Herbivore



Lion - Carnivore



Human - Omnivore

What are the differences in the type of teeth these animals have?

What would happen if the lion had teeth like an elephant?

Exit Ticket

t	o	n	g	u	e	t	h	w	o	g	g
o	c	o	a	r	e	c	t	u	m	r	a
s	e	o	t	c	a	n	i	n	e	e	l
a	i	s	n	m	s	i	n	a	r	c	l
e	a	n	o	s	u	n	a	i	m	u	b
r	n	t	c	p	u	c	o	o	a	d	l
c	s	t	f	i	h	m	l	i	v	o	a
n	e	f	u	r	s	a	e	r	y	r	d
a	l	l	a	m	r	o	g	r	a	p	d
p	r	e	m	o	l	a	r	u	s	w	e
i	n	t	e	s	t	i	n	e	s	e	r
t	o	o	t	h	n	r	e	v	i	l	t

oesophagus	tongue
stomach	tooth
liver	canine
gallbladder	incisor
intestine	molar
pancreas	premolar
rectum	producer
anus	consumer

Date:

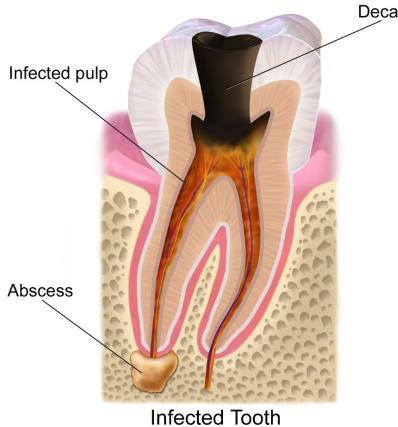
LESSON FOUR: Tooth Decay Enquiry Part 1

Do now: FEEDBACK

Look through what you have completed in your booklet so far and complete any blank pages. If you were absent, read the **Everybody reads** sections and write **ABSENT BUT READ** in **purple pen** and your sign your name.

If you **complete all** of your feedback, on your whiteboard write 5 questions about food for another person in the class to answer.

Outcomes	Key Vocabulary
<p>To ask relevant questions and use different types of scientific enquiries to answer them by distinguishing between scientific and non-scientific questions and choosing between types of scientific enquiry.</p> <p>To set up simple practical enquiries, comparative and fair tests by setting up an enquiry or test to understand what causes tooth decay.</p>	Tooth, decay, questions, scientific, non-scientific, practical enquiries, comparative tests, fair tests, variables.
Knowledge needed	
It will be helpful if children have previous experience of asking simple questions and recognising that they can be answered in different ways.	



Talk Task

Discuss the following questions with your talk partner:

What is tooth decay?

What causes tooth decay?

How do you know?

Talk Task

Why do scientists ask questions?

Why do they carry out enquiries and tests?

Scientific or not?

Tick the box to identify if the question is based on whether they are **scientific questions** that can be tested or whether they are **non-scientific questions**:

Question	Scientific	Non-scientific
Does eating fruit keep you healthy?		
What time is dinner?		
Can you open the lid?		
Does sound travel through walls?		
How much sleep do rabbits need?		
Does water always boil when heated?		
When should I do my homework?		
Do plants need soil to grow?		

Whole Class Activity

Now we need to generate some scientific questions about tooth decay.

Remember we need to be able to test them so...

- think about the equipment you would need
- think about how the test would need to be carried out

OUR SCIENTIFIC QUESTIONS:

Everybody Reads

What types of scientific enquiries are there?

Can you give examples of scientific enquiries or tests you have done?

How would you know what type of enquiry to choose?

We are going to look at some examples of questions and the kind of enquiries we could use to answer them.

Practical Enquiries

A simple practical enquiry is when you want to **just observe** what happens.

So if I want to answer the question:

Question:

What effect does water have on chewing gum?

A simple practical enquiry would involve:

- Placing the chewing gum in some form of liquid – for example water.
- Observing what happens to the chewing gum (does it change colour, grow/shrink, change shape) either immediately or over time (what would be sensible time intervals?).

In this enquiry I would need:

- Chewing gum
- A container
- Water
- A timer/clock (way to measure time)
- A table to record my observations.

Independent, Dependent and Controlled Variables

In the practical enquiry we are interested in the observation and what happens as we are not sure what the results will be.

When we conduct comparative or fair tests we want to **test the particular effect (dependent variable)** of **something (independent variable or variables)**.

Let's look at the different variables in more depth.

Independent Variable

What you decide to **change** in the test.

In the comparative and fair tests we will look at this, it will be the **liquids**.

I want to change the **liquids** to see if different **types of liquids** have **a particular effect (dependent variable)** on the chewing gum.

Dependent Variables

The changes that occur because of the **independent variable**. You only want one and this is why good questions are so important.

Do **liquids** change **the colour** of chewing gum? (Good, only one **dependent variable** – the colour of the chewing gum - which I can observe.)

Do **liquids** change **the size and colour** of chewing gum? (Not good because I am looking at **two dependent variables**. This is fine if the **liquid** does **effect the size and shape** or **does not affect either**.)

What if affects only one? You can't answer the question as yes or no in this situation. Therefore it is better to test **size** in one test and **colour** in a different test.)

Controlled Variables

These are kept the same so that they don't affect your results.

In my tests I want to know if **liquids** change **the colour** of chewing gum but if I use different containers to put the liquid in or put the containers in different parts of the room then it could be the **material of the containers** that has the effect or the **place in the room**, not the **liquid**. These differences would mean I was testing lots of types of **independent variables** when I just want to test one type - **liquid**.

That's why we have to **keep some things the same** throughout so that we know what is having the effect.

In my tests I would want the following things to be the same:

Containers

Where I place the containers

The amount of liquid in each container

The time between each observation

The type of chewing gum

The amount of chewing gum in each container.

Comparative Tests

Question: Do **liquids** affect **the colour** of chewing gum?

Independent Variable: Liquids (milk, water, orange juice)

Dependent Variable: Colour

Controlled Variables: Containers

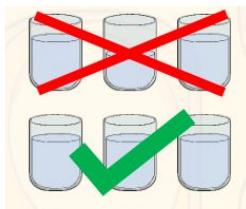
Where I place the containers

The amount of liquid in each container

The time between each observation

The type of chewing gum

The amount of chewing gum in each container.



In a comparative test:

- Record observations at **regular intervals of time**.
- Compare the results from different **liquids**.
- Spot patterns.

Liquid	Observation after 1 day.	Observation after 2 days.

Fair Testing

In a fair test:

- 1) Record observations at regular intervals of time.
- 2) Compare the results from different liquids and the control group.
- 3) Decide if changes caused are due to the liquid.

Add a control group – a container with chewing gum and no liquid. We do this because it **could be that chewing gum changes colour overtime anyway** and it may not be the liquid that is causing this!

We can't know that if we only compare containers with liquid. So in a fair test we make sure there is a **control group** so we can see what would happen without the **dependent variable**.

Class investigation: Comparative test

Question: _____

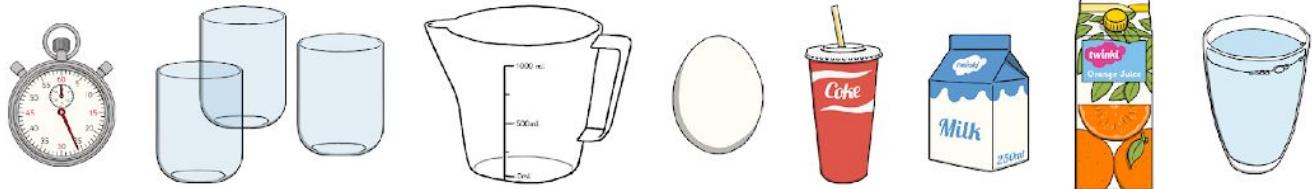
Prediction: _____

Independent Variable (Changes) _____

Dependent Variable (The effect) _____

Controlled Variables (Keep the same) _____

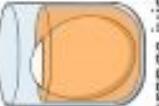
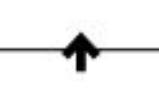
Equipment:



Method

Exit Ticket

What do you think will happen to the eggs in the various liquids? Draw a picture to show what you think will happen each day.

Day 1	 water	 cola	 orange juice	 apple juice	 milk		
Day 2	 water	 cola	 orange juice	 apple juice	 milk		
Day 3	 water	 cola	 orange juice	 apple juice	 milk		
Day 4	 water	 cola	 orange juice	 apple juice	 milk		
Day 5	 water	 cola	 orange juice	 apple juice	 milk		
Day 6	 water	 cola	 orange juice	 apple juice	 milk		
Day 7	 water	 cola	 orange juice	 apple juice	 milk		

LESSON FIVE: Tooth Decay Enquiry Part 2

Do now:

Read through your experiment sheet and finish off any parts you need to, are there any corrections you need to make? Did you finish your predictions?

Outcomes	Key Vocabulary
To make systematic and careful observations by observing the changes that occur in their enquiry or test. To use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. By presenting findings, making predictions and raising questions about results.	Erode, erosion, test, practical enquiry, fair test, comparative test, time intervals, observe, record, scientific language, conclusion, prediction, questions.
Knowledge needed	
Children will have selected and planned their enquiry in lesson 4.	

Whole Class Task

Setting up the experiment!

We have make sure that:

- There is the same amount of liquid in each container.
- You follow your instructions. If you find you missed a step – add it in!
- Everyone in the group takes part.
- You remember to include a control group if you are conducting a fair test.
- You are careful when placing the eggs. If they are broken then it will affect your results.
- If you use any equipment you have not listed, add it in!

Date:

LESSON SIX: Food Chains

Do now:

Results - Teacher to take a photo each day.

Results:

Was your prediction correct? _____

Conclusion (What did you find out from your observations? What effect the drinks had and what you have learnt from the enquiry/test)

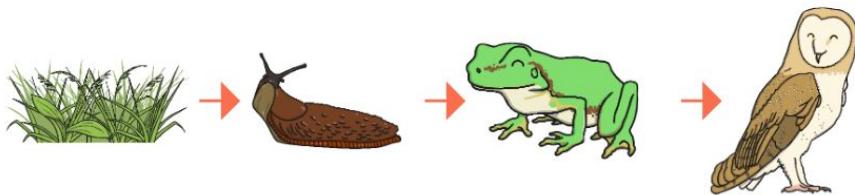
Outcomes	Key Vocabulary
Construct and interpret a variety of food chains, identifying producers, predators and prey. Understand food chains and the role of different plants and animals within them.	Food chain, predator, consumer, prey, producer, construct, interpret, diagram.
Knowledge needed	
It will be helpful if children have basic knowledge of food chains.	

Everybody Watches

What is a food chain? Let's watch the video to find out

(<https://www.bbc.co.uk/bitesize/clips/z8hxpv4>)

Talk Task



How is the food chain constructed?

What do the arrows represent?

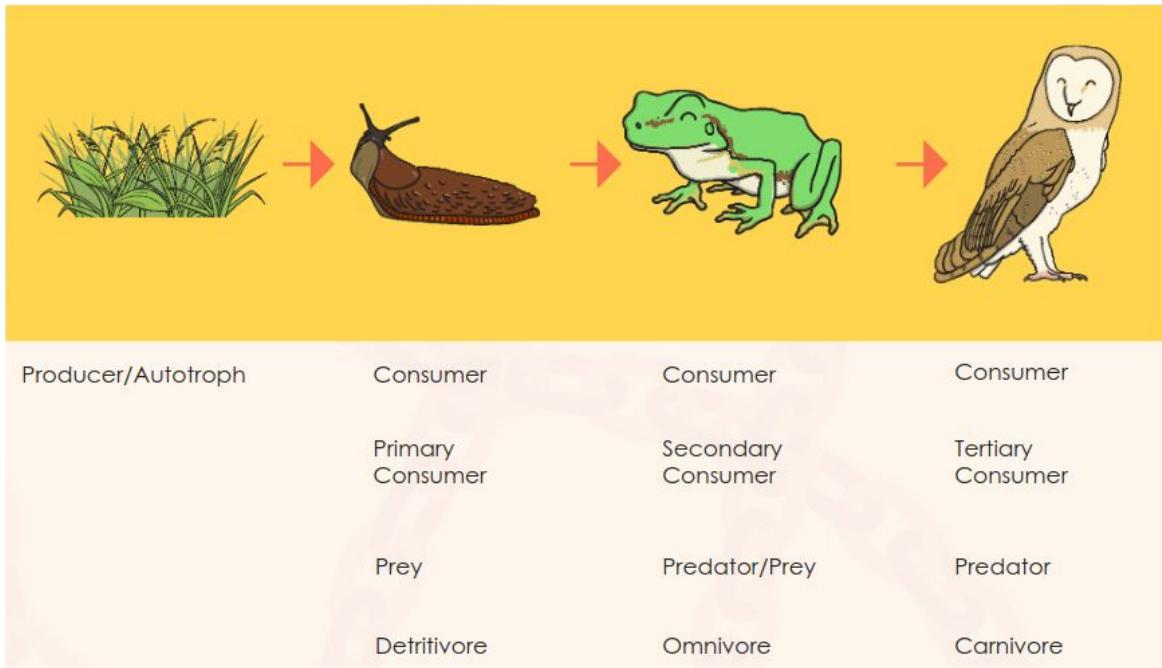
How should we label the different parts of the food chain?

Group Task

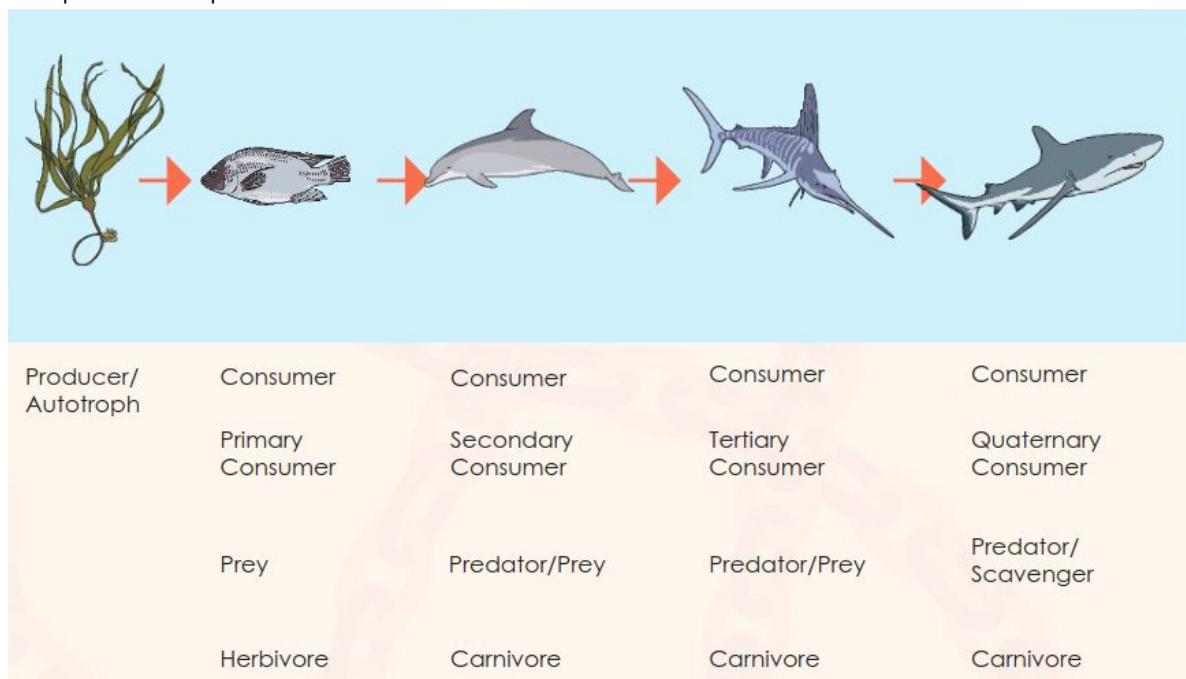
Use your knowledge organiser to help you find out what these words mean. Write your own definition in the column next to it.

Words	Definition
Herbivores	
Carnivores	
Omnivores	
Detritivores	
Producers/Autotrophs	
Consumers	
Primary Consumer	
Secondary Consumer	
Tertiary Consumer	
Prey	
Scavenger	
Predators	
Decomposer	

Labelling food chains



A more complex example...



Group Activity

Use the picture sheets to help you answer these challenges:

1. Create a food chain with one producer, one carnivore and one herbivore.

2. Create a food chain where the last consumer is an omnivore.

3. Create a good chain with one producer, a primary consumer and a secondary consumer.

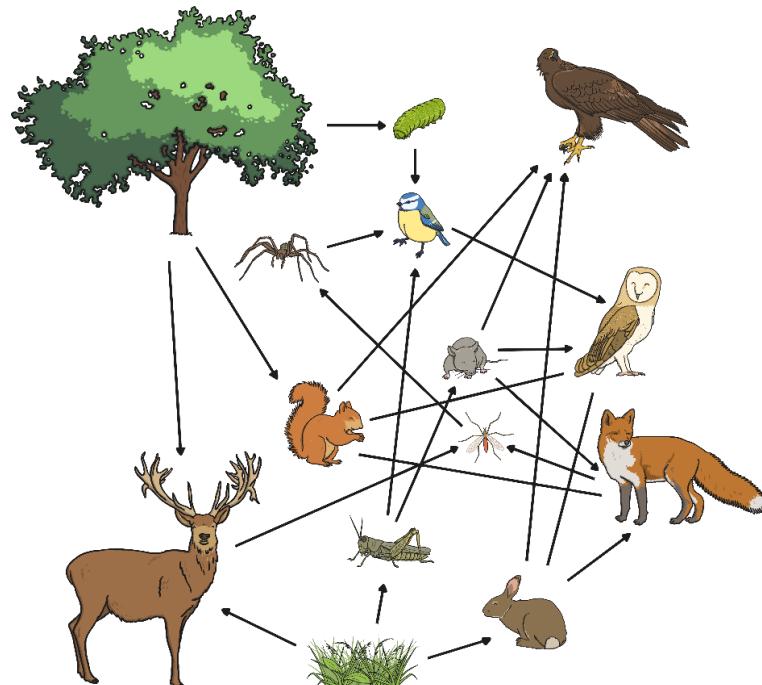
4. Create the longest food chain you can including a producer, detritivore and at least one consumer.
-
-
-

Extension

Follow the Food web! How many food chains can you find in the food web.

For example

Tree → Caterpillar → Blue tit → Owl

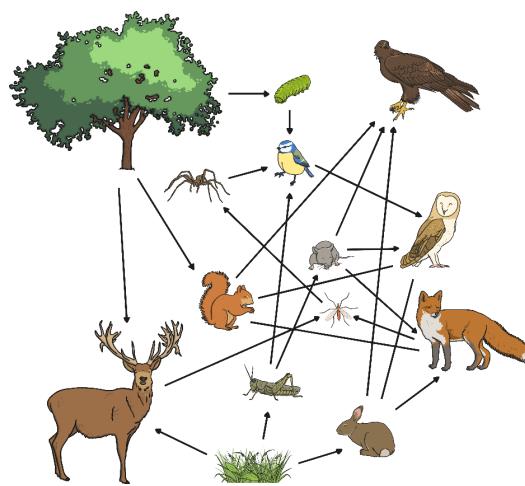


What is the biggest chain you can create?

Exit Ticket

This is a **food web**.

How are food webs similar/different to food chains?



When would it be better to use a food chain?

When would a food web be better?
