

Kirkcaldy High School



BGE Science

Sports Science

Nutrition and Digestion

Name: _____

Class: _____

Teacher: _____

Expectations and Outcomes Learner Evaluation

Topic: Nutrition and digestion

Experience and Outcomes	Date Completed (dd/mm/yy)	Evaluation How happy are you with it? (😊 ? 😞)
I can describe a balanced diet.		
I can state the main food groups.		
I can construct a bar chart.		
I can describe the function of each food group.		
I can create an eat well plate.		
I can test for proteins in food.		
I can test food for carbohydrates.		
I can safely investigate the energy content of foods.		
I can describe the effects of energy drinks on health.		
I can design my own energy drink.		
I can name the 4 types of teeth.		
I can describe the job of each type of tooth.		
I can describe the purpose of teeth.		
I can identify different parts of the tooth.		
I can describe problems that can affect our teeth		

I can state what plaque is.		
I can explain what plaque does to our teeth.		
I can state the definition of digestion.		
I can state which organs make up the digestive system.		
I can state the role of enzymes in digestion.		
I can carry out an investigation on digestive enzymes.		
I can explain the function of stomach acid.		
I can describe the problems associated with excess stomach acid.		
I can describe how indigestion can be treated with anti-acids.		

Date: _____

A Balanced Diet

Starter

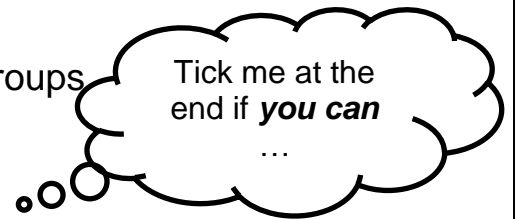
Athletes and sports people need a balanced diet – what do YOU think makes up a “balanced diet”?

Learning Intentions

- To explore what makes a balanced diet
- To find out the main food groups
- To construct a bar chart showing the main food groups

Success Criteria

- I can describe a balanced diet
- I can state the main food groups
- I can construct a bar chart



Food Groups

A _____ provides the body with all the **essential** _____
and _____ that we need to stay healthy.

Elements are present in our diet and in our bodies as _____ **compounds**.

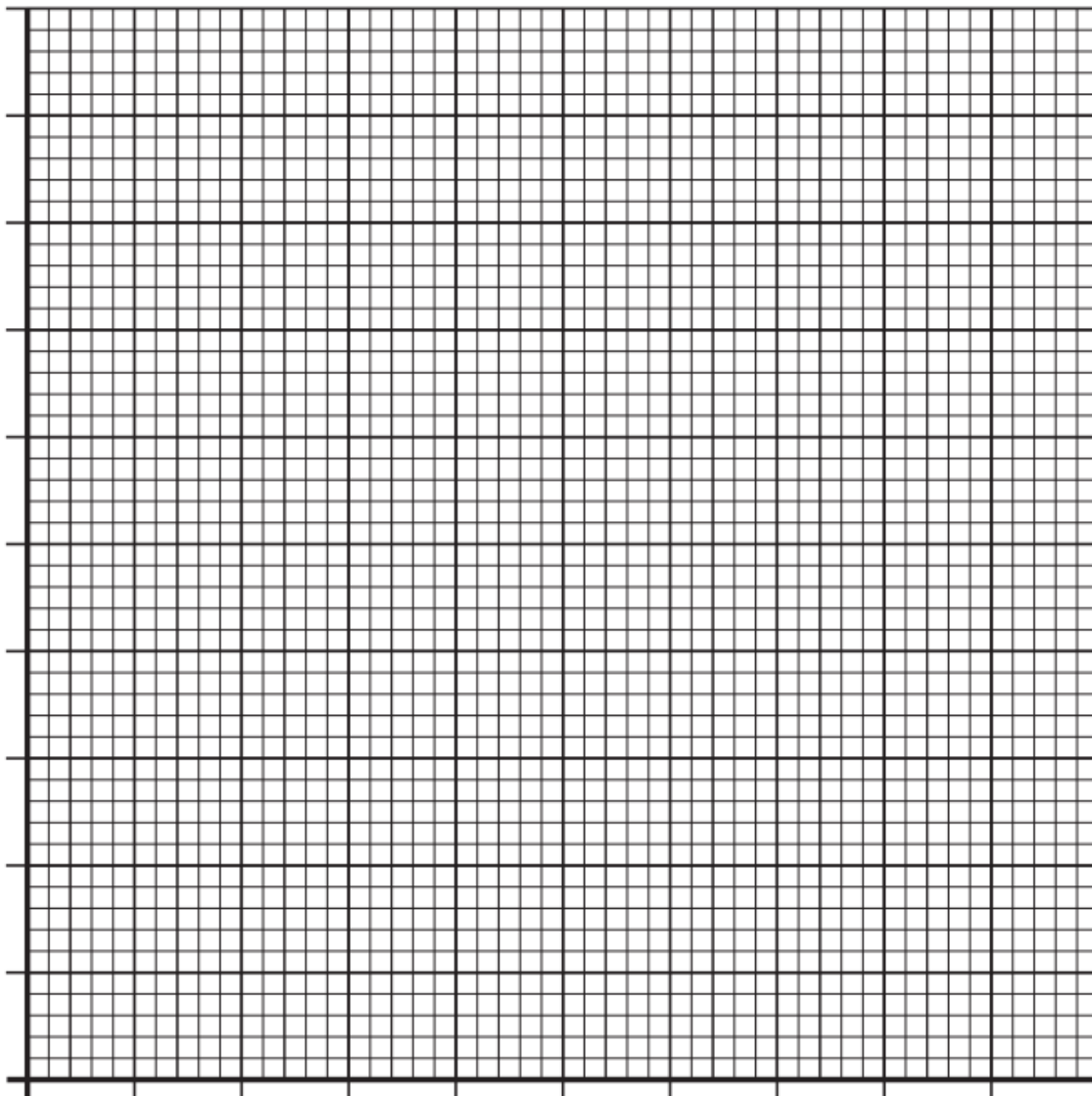
The main compounds that are essential in our diet are _____,
and _____.

Compounds	Elements present
	carbon, hydrogen, oxygen.
	carbon, hydrogen, oxygen.
	carbon, hydrogen, oxygen, nitrogen and others.

The table below shows the main **food groups** and the approximate proportion needed for a balanced diet.

Types of Food	%
Carbohydrates	35
Fruits and vegetables	30
Dairy	14
Protein	14
Fats	7

Draw a graph using these results.



Food groups and Eatwell plate

Starter

1. Name the different food groups that are important in a balanced diet.

2. Give examples of different foods which would fit into each of the groups.

Learning Intentions

- To learn about the different food groups.
- To find out why our body needs each of the different food groups

Success Criteria

I can describe the function of each food group

I can create an eat well plate.

Tick me at the end if *you can*
...

Food groups

Use the information given to you by your teacher to fill out the table.

Food Group	Examples	Function
carbohydrate		
fat		
protein		

You will now create an Eatwell plate, copies will be given by your teacher.

Testing for Fat

Starter

1. Name 3 foods which are fats.

2. Why are fats needed by the body?

Learning Intentions

- To learn how to test for fats

Success Criteria

I can test for fats



Tick me at the end if *you can*

...

Fats and oils

Fats are mainly obtained from _____

Oils are mainly obtained from _____.

Fats and oils leave a _____ mark on filter paper.



Testing for fat experiment

Aim: _____

Method:

Results:

Food	Observation	Does it contain fat?

Conclusion: *(remember your aim)*

What have I found out from my experiment?

Evaluation:

What could I have done to improve my experiment

Testing for Protein

Starter

How do we test for fat?

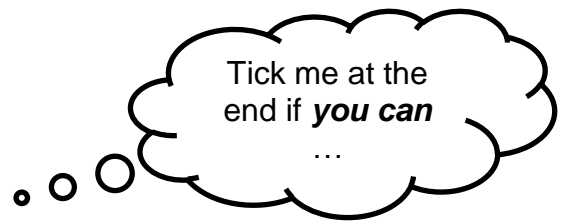
Can you remember any foods that contain fat?

Learning Intentions

- To find out how to test for proteins in food.

Success Criteria

- I can test for proteins in food.



Proteins

Proteins are obtained from both _____ and _____.



Proteins are important as they provide the material for the _____ and _____ of the body.

Testing for protein experiment

Aim: _____

Method:

Results:

Food	Observation	Does it contain protein?

Conclusion: *(remember your aim)*

What have I found out from my experiment?

Evaluation:

What could I have done to improve my experiment?

Testing for carbohydrates

Starter

1. Name the indicator we use to test for protein.

2. Describe the colour change if protein is present.

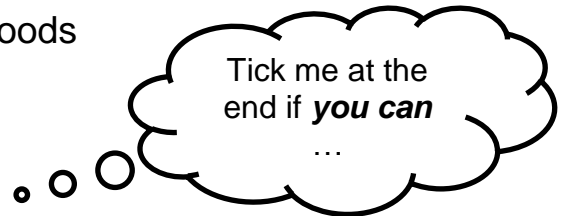
3. Name some foods containing protein that you tested.

Learning Intentions

- To learn how to test for carbohydrates in foods

Success Criteria

I can test food for carbohydrates



Carbohydrates

Carbohydrates are an essential part of the diet as they give us _____.

Foods with a high carbohydrate level include pasta, bread, sugar, rice and potatoes.

There are 2 types of carbohydrates: _____ and _____.

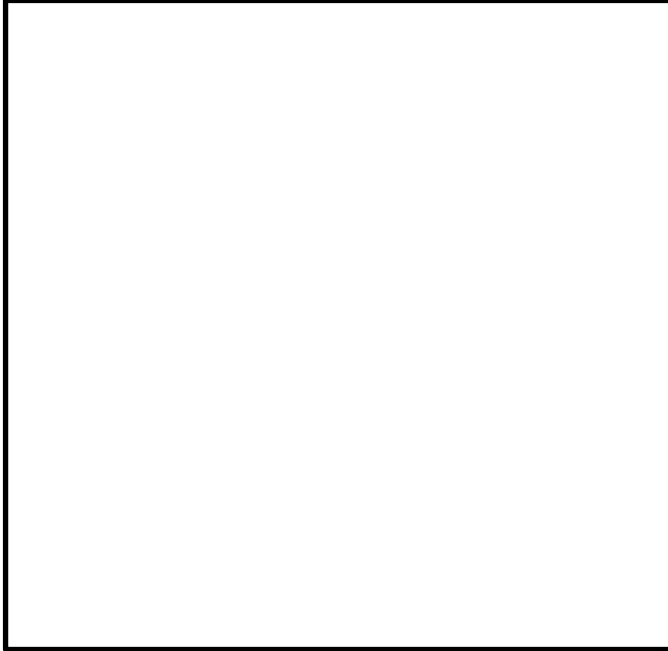
_____ releases energy _____, _____ release energy _____.



Testing for carbohydrates experiment

Aim: _____

Method:



Results/conclusion:

Iodine is used to test for _____. If starch is present, iodine changes from _____ to _____ - _____.

Benedict's solution is used to test for _____. If sugar is present, Benedict's changes from _____ to _____.

Energy in Foods

Starter

1. Which type of carbohydrate changes iodine from orange to a blue/black colour?

2. Which type of carbohydrate changes Benedict's solution from blue to an orange/red colour?

Learning Intentions

- To investigate the energy content of different foods.

Success Criteria

I can safely investigate the energy content of foods.

Tick me at the end if **you can**
...

Measuring the energy in foods

The energy content of foods is shown on the packaging in _____ (kJ). (The "old" unit was _____).

Our bodies require a certain amount of energy every day. Our age, activity levels and gender affect how much energy we need daily.

Our bodies store _____ energy in our bodies as fat.

	Typical values	100ml contains	250ml contains	%GDA*
Energy		199kJ 47kcal	500kJ 120kcal	6% 2000kcal
Protein		0.5g	1.3g	
Carbohydrate		10.5g	26.3g	29%
of which sugars		10.5g	26.3g	
Fat		trace	trace	
of which saturates		trace	trace	
Fibre		trace	trace	
Sodium		trace	trace	
Salt equivalent		trace	trace	

*Guideline daily amounts

Vitamins/Minerals

100ml contains 62.5mg (100% RDA)

Testing for Energy in Different Foods

Aim: _____

Method:

Results:

Crisp	Initial Temperature (°C)	Final Temperature (°C)	Temperature Change (°C)

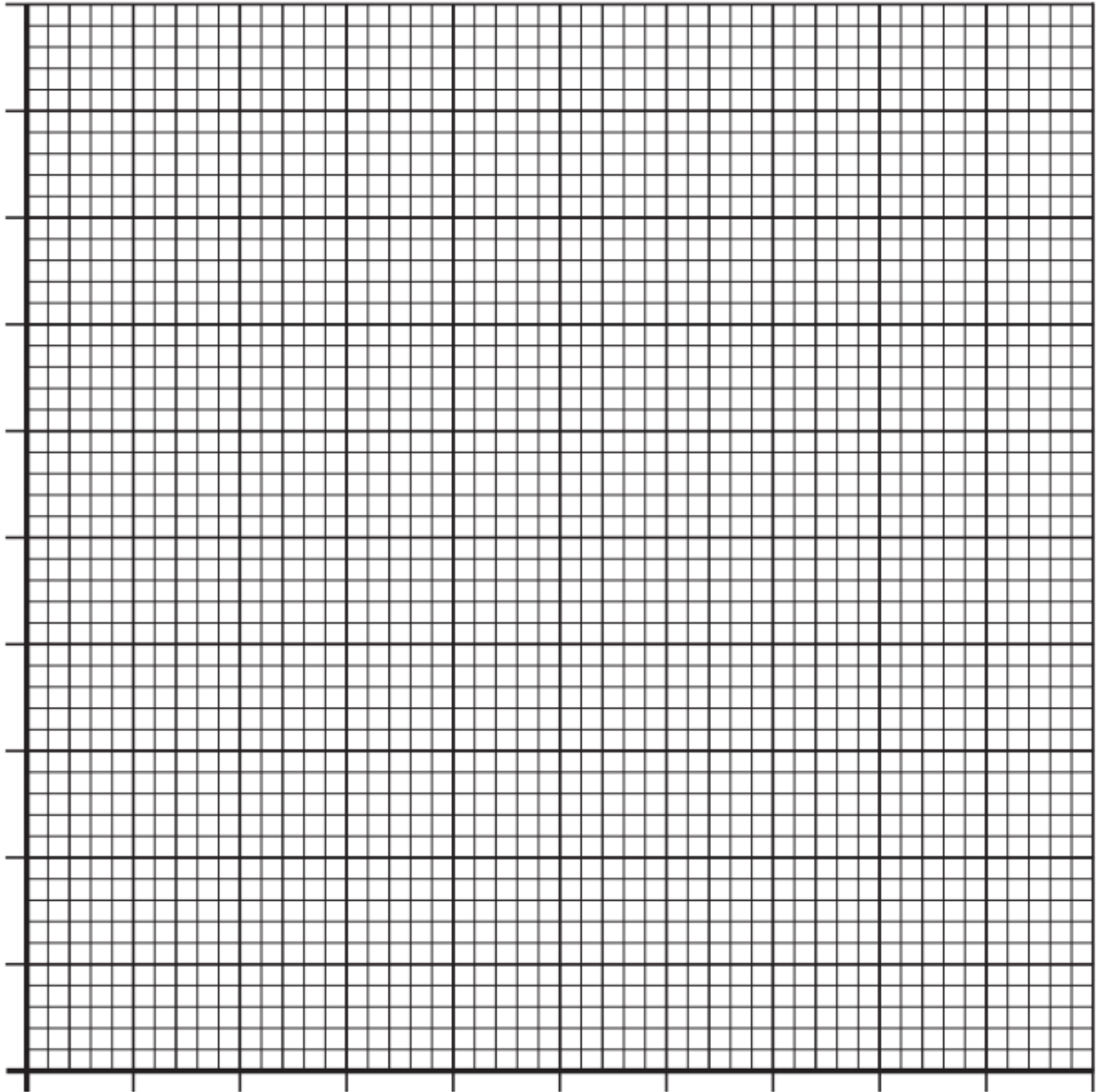
Conclusion: *(remember your aim)*

What have I found out from my experiment?

Evaluation:

What could I have done to improve my experiment?

Extension: *If you have completed your experimental write up, use your table of results to construct a bar chart on the following page.*



Energy Drinks

Starter

Daily requirements

Age (yrs) Gender	18-35	36-55	Over 55
Male energy needs (kJ)	2760	2480	2100
Female energy needs (kJ)	2250	2050	1660

1. Which gender needs more energy on average?

2. How does age affect our energy requirements?

Learning Intentions

- To learn about energy drinks and their effects on health

Success Criteria

I can describe the effects of energy drinks on health

I can design my own energy drink

Tick me at the end if *you can*
...

Creating an energy drink

The two main ingredients in energy drinks are _____ and _____.

Step 1: Write a list of ingredients you consider 'harmless/healthy':

1) _____

2) _____

3) _____

4) _____

Step 2: Write a list of ingredients you consider 'unhealthy':

1) _____

2) _____

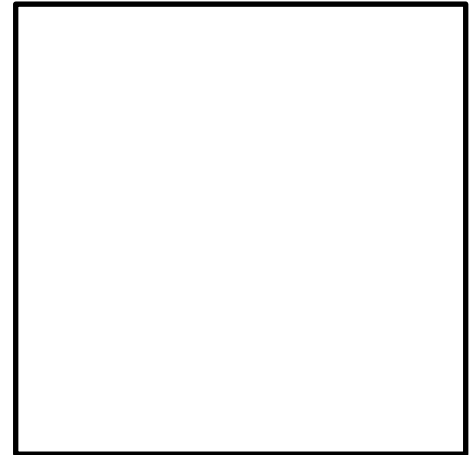
3) _____

4) _____

Teeth

Starter

1. Draw your idea of the perfect tooth in the box.



2. What shape is it? Why is it this shape?

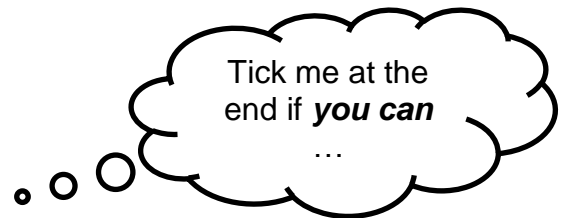
3. How many teeth do you think you have?

Learning Intentions

- To name the 4 types of teeth
- To describe the job of each type of tooth.
- To describe the purpose of teeth.

Success Criteria

- I can name the 4 types of teeth
- I can describe the job of each type of tooth.
- I can describe the purpose of teeth.



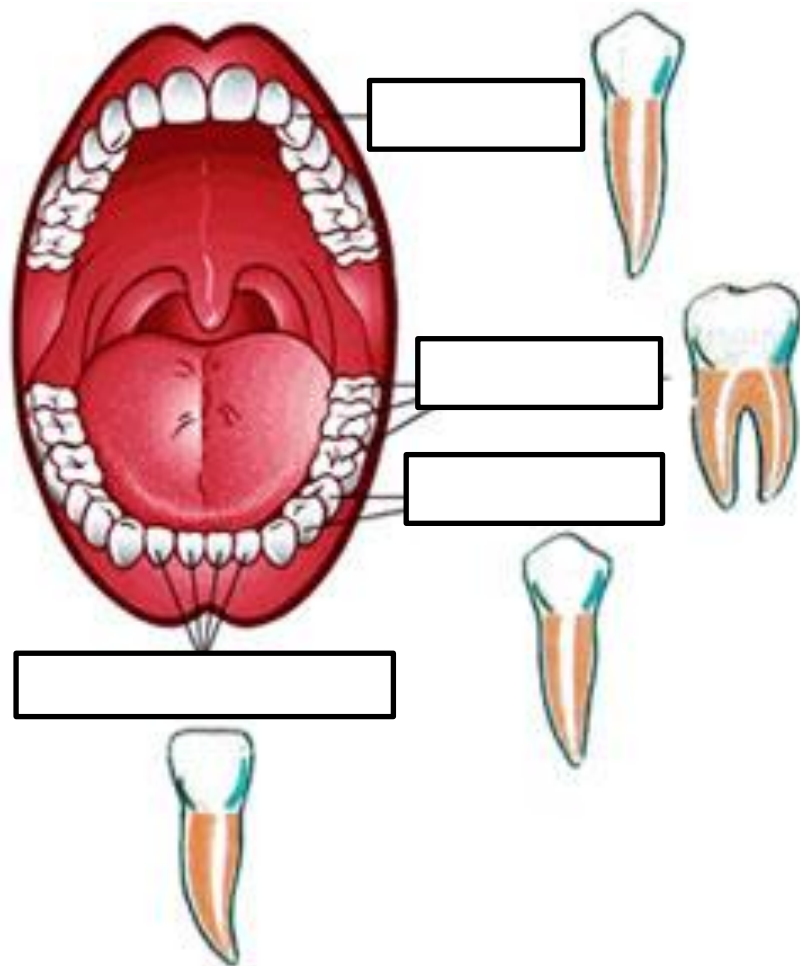
Types of teeth

A normal adult mouth has _____ teeth.

There are _____ different types of teeth which do different jobs.

Teeth break down food _____.

There are 4 types of teeth – _____, _____, _____ and _____.



Type of Tooth	Function
Incisor	
Canine	
Premolar	
Molar	

Parts of the Tooth

Starter

1. Name the four types of teeth

2. Explain what each type of tooth does

Learning Intentions

- To find out the different parts that make up our teeth.
- To find out about problems that can affect our teeth

Success Criteria

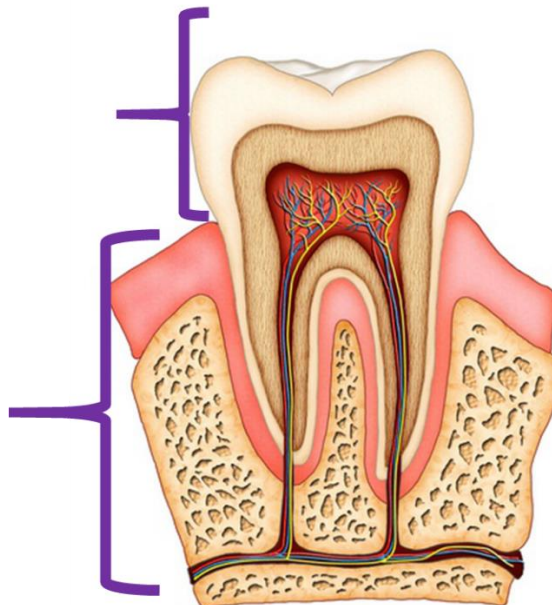
I can identify different parts of the tooth

I can describe problems that can affect our teeth.

Tick me at the
end if ***you can***

...

Anatomy of a tooth



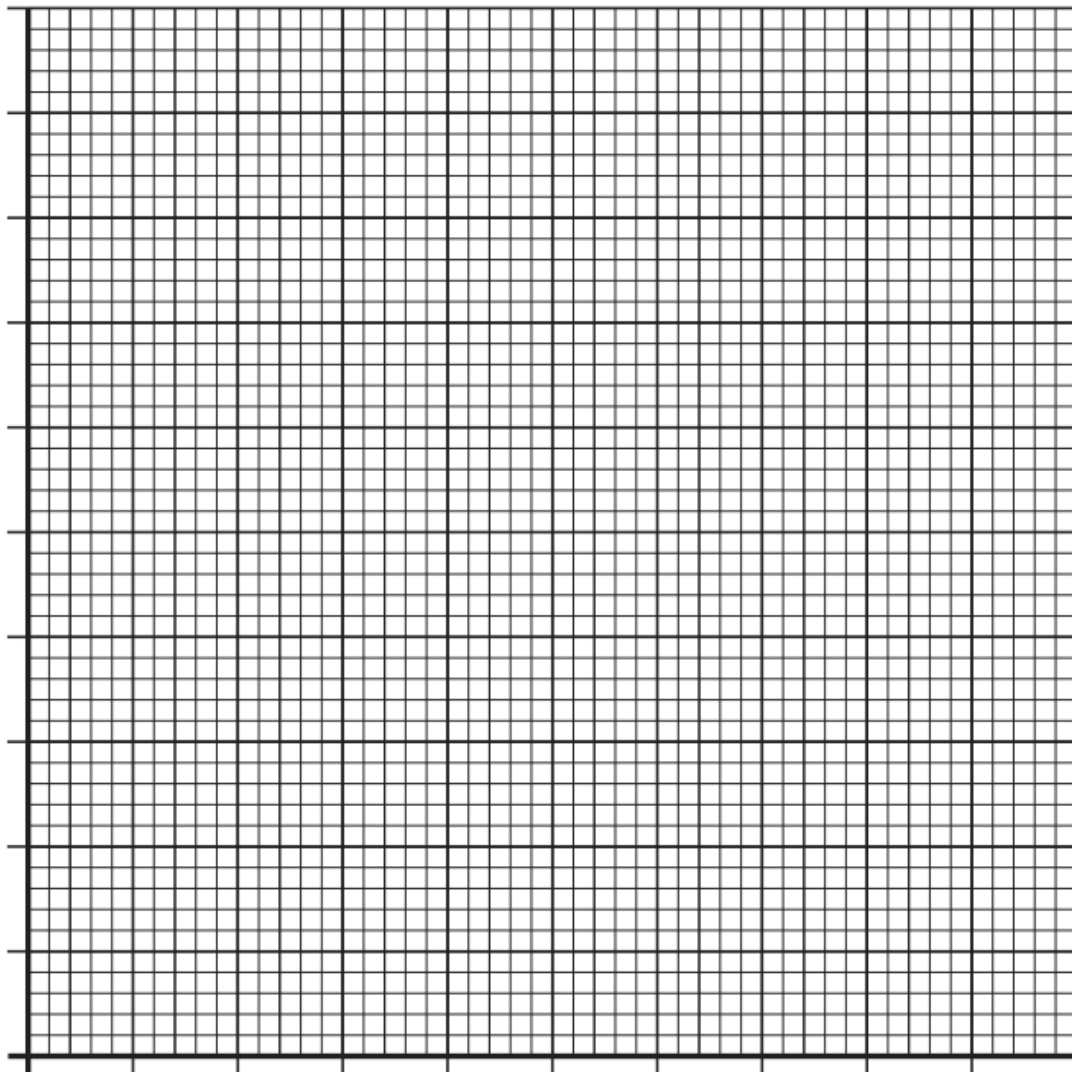
_____ is a very hard substance which covers the tooth.

_____ is a soft substance under the enamel

A survey was carried out to find out how long adults have gone without visiting the dentist. The results were as follows:

Length of time between dentist visit	Percentage of adults (%)
Less than 1 year	26
1-2 years	25
3-4 years	22
5-10 years	13
More than 10 years	12

Present the above information as a bar chart



Toothpaste

Starter

1. Why do we brush our teeth?

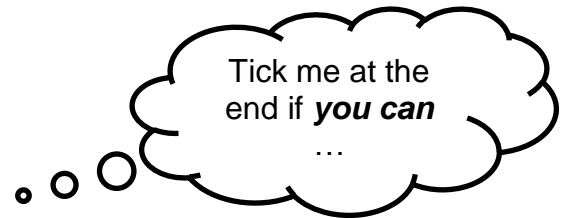
2. What happens if we don't?

Learning Intentions

- To find out what plaque is.
- To find out what it does to our teeth.

Success Criteria

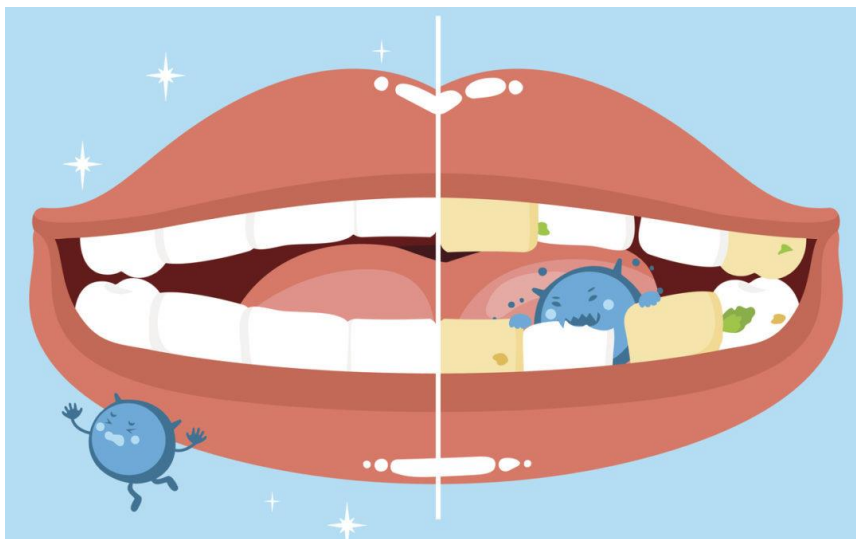
- I can state what plaque is.
- I can explain what plaque does to our teeth.



How does toothpaste work?

Bacteria in plaque produce _____ which cause tooth decay.

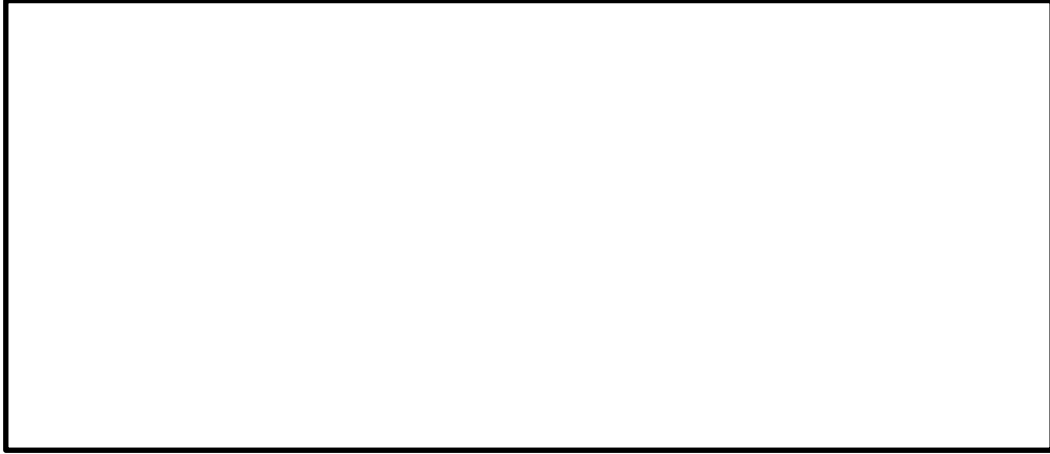
Toothpaste contains an _____ which _____ the acids.



Toothpaste Experiment

Aim: _____

Method:



Results: (which toothpaste was better?)

Conclusion: (*remember your aim*)

What have I found out from my experiment?

Evaluation:

What could I have done to improve my experiment?

Digestion

Starter

Brainstorm what you already know about digestion

Learning Intentions

- To find out the definition of 'digestion'
- To learn which organs make up the digestive system

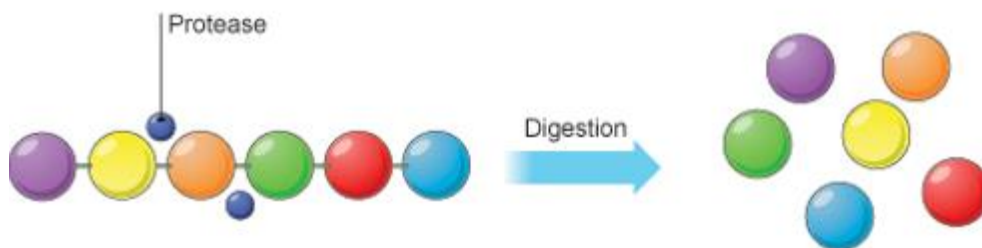
Success Criteria

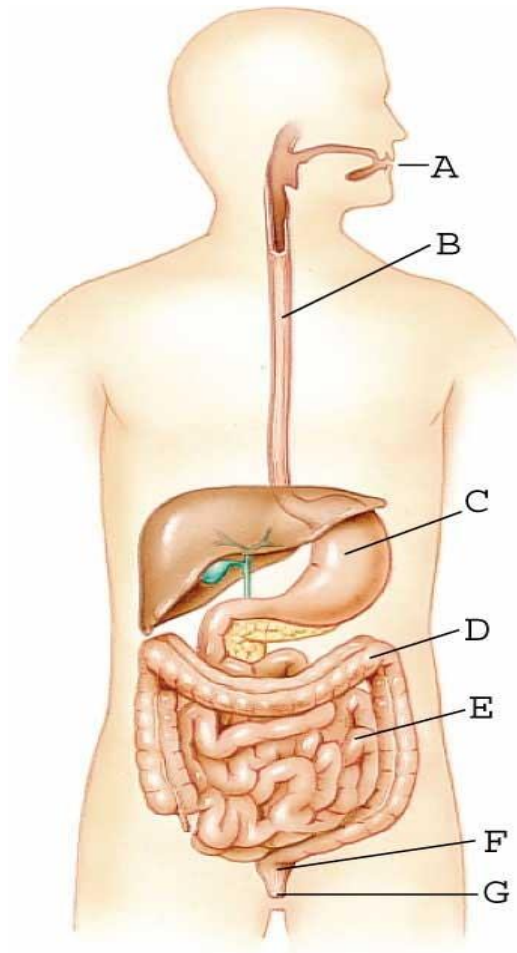
- I can state the definition of digestion.
- I can state which organs make up the digestive system



Definition of digestion

Digestion is the physical and chemical breakdown of _____ food particles into _____ food particles so that they can be absorbed into the blood.





<u>Organ</u>	<u>How it helps break down food</u>
Mouth	
	Carries food from mouth to stomach
Stomach	
	Breaks food down from large insoluble molecules to small soluble molecules, and absorbs them into the blood
Large intestine	
	Stores solid waste
Anus	

Gums to bums demonstration...

Digestive enzymes

Starter

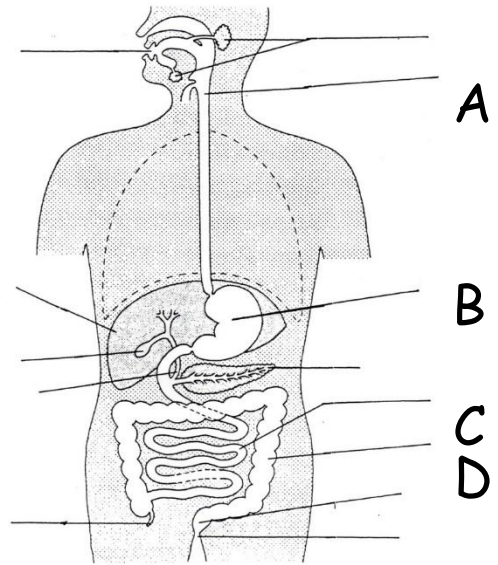
1. Name the parts labelled A to D.

A. _____

B. _____

C. _____

D. _____



2. What is meant by 'digestion'?

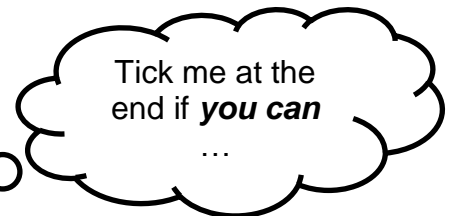
Learning Intentions

- To find out about the role of enzymes in digestion
- To investigate digestive enzymes

Success Criteria

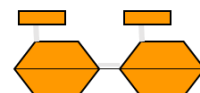
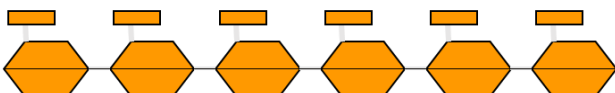
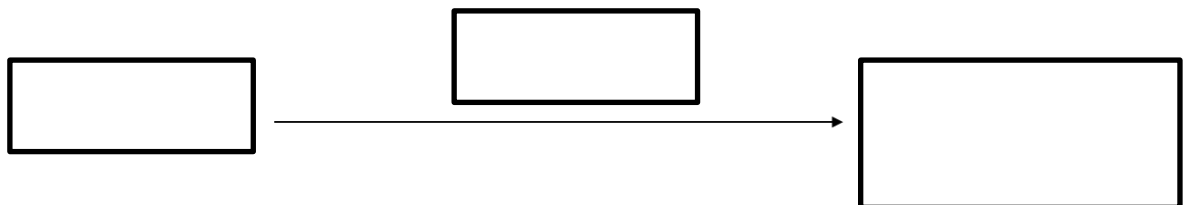
I can state the role of enzymes in digestion

I can carry out an investigation on digestive enzymes



Enzymes

- Enzymes are molecules made in all cells that help _____.
- Enzymes are needed to _____ break down food.



Investigating digestive enzymes

Aim: _____

Method:

Results:

Test tube	Starch test (✓ / x)	Sugar test (✓ / x)
1		
2		
3		

Conclusion: *(remember your aim)*

What have I found out from my experiment?

Test tube 1 contained _____ because ...

Test tube 2 contained _____ because ...

Test tube 3 contained _____ because ...

Indigestion

Starter

1. Why do we have acid in our stomach?

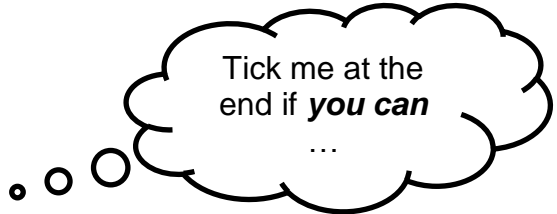
2. What do you think happens when we have too much stomach acid?

Learning Intentions

- Explain the function of stomach acid.
- Describe the problems associated with excess stomach acid.
- Describe how indigestion can be treated with anti-acids.

Success Criteria

- I can explain the function of stomach acid
- I can describe the problems associated with excess stomach acid
- I can describe how indigestion can be treated with anti-acids.

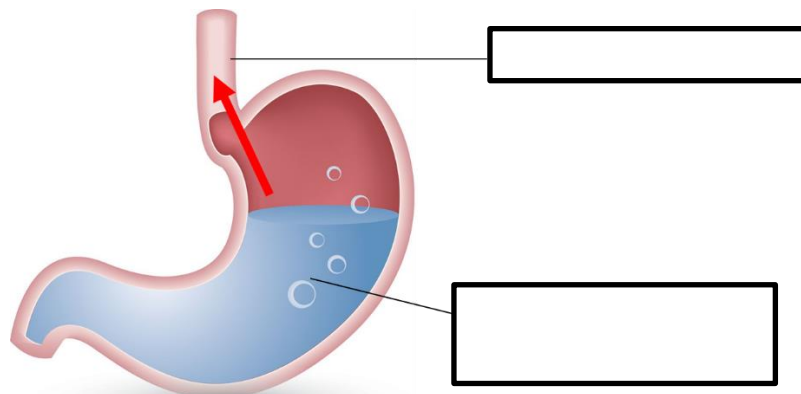


Stomach Acid

Stomach acid is needed to _____ break down the food we eat.

Too much stomach acid can cause _____ (or heartburn)

Too little stomach acid can mean digestion is not as efficient.



Antacids

Antacids (e.g. Rennie's) _____ the stomach acid to treat indigestion.

Investigating Indigestion

Aim: _____

Method:

Results:

Acid	Colour of universal indicator	Acid/Alkali/ Neutral
Without Rennies		
With Rennies		

Conclusion: *(remember your aim)*

What have I found out from my experiment?

Evaluation:

What could I have done to improve my experiment?

Extension Tasks

Word Search

Nutrition and Digestion

C	A	R	B	O	H	Y	D	R	A	T	E	S	N
N	N	U	T	R	I	T	I	O	N	R	A	U	A
S	L	O	H	C	R	A	T	S	A	K	E	G	L
O	R	E	N	I	N	A	C	A	I	F	T	A	C
T	A	F	R	I	D	T	O	L	S	E	E	R	E
P	R	O	T	E	I	N	O	K	I	N	T	B	N
L	I	T	E	I	T	J	I	A	N	Z	S	R	O
T	B	I	D	A	O	B	C	L	C	Y	A	N	I
E	N	I	C	U	O	K	T	I	I	M	P	F	T
E	C	H	L	S	I	E	L	R	S	E	H	I	S
A	L	E	T	K	L	T	I	H	O	D	T	B	E
F	A	U	M	L	I	K	I	K	R	I	O	R	G
R	B	A	L	A	N	C	E	D	S	A	O	E	I
E	E	N	I	T	S	E	T	N	I	U	T	A	D

PROTEIN
INCISOR
ALKALI
KILOJOULE
ACID
ENZYME
SUGAR
TOOTHPASTE
DIGESTION
STARCH
FAT
CARBOHYDRATE
CANINE
NUTRITION
FIBRE
BALANCED
INTESTINE
OIL

Riddles

1. Riddle: I provide fuel for your body and come in three different forms. I can be simple or complex, and I'm found in foods like bread, pasta, and corn. What am I?

2. Riddle: I am a rainbow on your plate, offering a variety of nutrients and taste. I come in many shapes and sizes, and I'm essential for a healthy waist. What am I?

3. Riddle: I'm a vital part of your meal, and I help you build and repair. I can come from both animals and plants, making me versatile and fair. What am I?

4. Riddle: I am a group of foods that provide energy and keep you satisfied. I include bread, rice, pasta, and cereals, all made from a tiny seed that's dried. What am I?

5. Riddle: I am the beginning of your digestion process, where food starts to break down. With the help of teeth and a watery substance, I prepare your food for its journey around. What am I?

6. Riddle: I am a coiled tube where most digestion takes place. Nutrients are absorbed, and waste is formed within my lengthy space. What am I?

7. Riddle: I store the leftovers after the nutrients have been taken away. My job is to remove water and form the waste your body will display. What am I?

8. Riddle: I am a tiny, beneficial organism that makes a home within your gut. I aid in digestion and help keep your immune system in a healthy rut. What am I?

9. Riddle: I am a crucial organ that resembles a triangular shape. I produce a greenish fluid that aids in breaking down fats, so they don't escape. What am I?

10. Riddle: I am an essential part of your diet that keeps your digestion on track. Though I can't be broken down, I help move things along without any slack. What am I?

Extra Questions

1. What are the five main food groups that make up a balanced diet?

2. How many portions of fruits and vegetables should you eat daily for a healthy diet?

3. What are the three macronutrients that provide energy for our bodies?

4. What role do proteins play in our body, and can you name two protein-rich foods?

5. What is the primary function of carbohydrates, and can you name two carbohydrate-rich foods?

6. What is the iodine test, and how is it used to test for the presence of starch in foods?

7. What are the main differences between simple and complex carbohydrates?

8. Why is it important to have a good balance of vitamins and minerals in our diet?

9. What is the role of fiber in our digestive system, and can you name two fiber-rich foods?

10. What are the potential negative effects of consuming energy drinks, especially for children and adolescents?

11. How do the different types of teeth (incisors, canines, premolars, and molars) function in the process of digestion?

12. Can you list the main organs of the digestive system and describe their functions?

13. What are enzymes, and how do they help in the process of digestion?

14. How does the enzyme amylase break down carbohydrates in the mouth?

15. What is the role of stomach acid in digestion, and how does it help break down food?

16. What are some common causes of indigestion, and how can it be prevented or treated?

17. What is the main function of the small intestine, and how does it absorb nutrients from digested food?

18. How does the large intestine help in the process of digestion and elimination of waste?

19. What role do probiotics play in maintaining a healthy digestive system, and can you name two food sources of probiotics?

20. Why is it important for individuals to stay hydrated, and how does water aid in the digestion and absorption of nutrients

