KS3 SCIENCE · BIOLOGY

Food and digestion revision sheet

Name _____

1. Nutrients

PART OF THE DIET	WHAT THE BODY NEEDS IT FOR	GOOD SOURCES
Carbohydrates	The body's main source of energy. Two types: sugars and starch.	Bread, pasta, rice, potatoes
Lipids (fats and oils)	A source of energy, and a store of energy.	Butter, oil, nuts, milk, eggs
Protein	Building new tissue, for growth and repair.	Meat, fish, eggs, dairy foods, beans, nuts
Vitamins	Small amounts keep the body healthy. C helps wounds to heal, D is needed for strong bones, A helps you to see in dim light.	Fruit and vegetables. Oily fish and eggs give vitamin D.
Minerals	Small amounts keep the body healthy. **Iron** is needed for red blood cells. **Calcium** is needed for strong teeth and bones.	Iron: red meat, beans, leafy greens. Calcium: milk, cheese, yoghurt.
Fibre	Parts of plants that cannot be digested. It keeps food moving through the gut and helps the body to get rid of waste.	Wholemeal bread, cereals, fruit, vegetables, beans
Water	More than half of the body is water. The chemical reactions in cells take place in it.	Drinks, and many foods



2. A balanced diet

- A **balanced diet** gives the body the right amount of each of the seven parts: not too little and not too much.
- No single food has everything, so a balanced diet needs a variety of foods.
- Most foods give more than one nutrient, but each has a main one. Bread and rice are mostly carbohydrate. Chicken and fish are rich in protein. Butter and oil are mostly lipid.



3. Energy in food

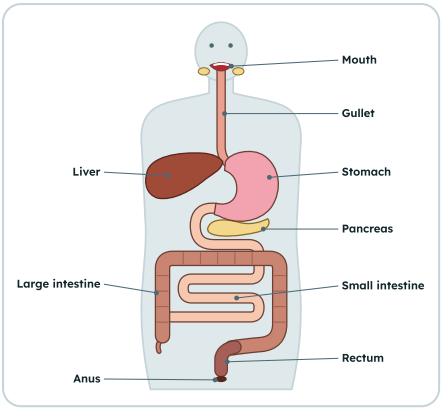
- The energy in food is measured in **kilojoules (kJ)**. A food label gives the energy in 100 g, so that foods can be compared.
- Lipids hold the most energy: 1 g of lipid has about twice as much as 1 g of carbohydrate or protein.
- Energy needs depend on **age** and **activity**. A child aged 5 needs about 6000 kJ a day and a teenager aged 15 about 11,000 kJ. An active job or a day of sport raises the need.

4. When a diet goes wrong

- **Starvation:** far too little energy for a long time. The body uses up its stores of fat and breaks down muscle. The person becomes very thin and weak.
- **Obesity:** when more energy is taken in than is used, the body stores the extra as fat. Obesity means having so much stored fat that it can harm health. It raises the risk of heart disease and type 2 diabetes.
- **Malnutrition:** the diet has the wrong balance of nutrients. A **deficiency disease** is caused by too little of one vitamin or mineral.

DISEASE	TOO LITTLE	WHAT HAPPENS
Anaemia	Iron	Too few healthy red blood cells, so the blood carries less oxygen. The person is tired and pale.
Scurvy	Vitamin C	Gums bleed and wounds heal slowly.
Rickets	Vitamin D	A child's bones stay soft and can bend.
Night blindness	Vitamin A	The person cannot see in dim light.

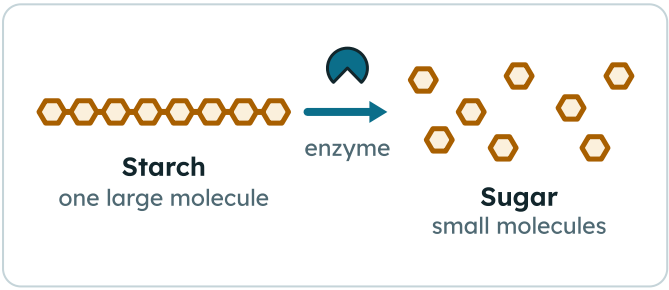
5. The digestive system and 6. The journey of food



- **Digestion** means breaking large food molecules into small ones.
- Muscle in the wall of the gut pushes the food along. The journey takes a day or two.

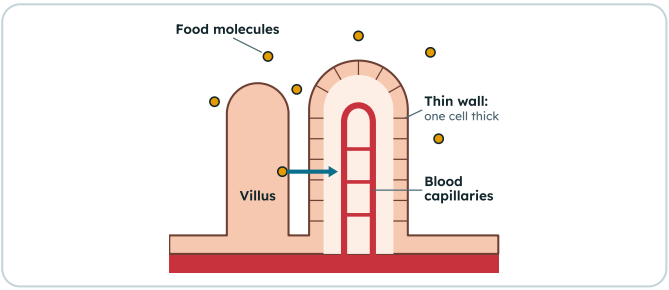
ORGAN	WHAT HAPPENS THERE (THE FIRST SIX ARE IN THE ORDER THAT FOOD REACHES THEM)
Mouth	Teeth chew the food. Saliva from the salivary glands makes it slippery and starts to digest starch.
Gullet	Muscle in its wall squeezes the food down to the stomach.
Stomach	Churns the food with acidic juices. The acid kills microorganisms. The digestion of protein starts.
Small intestine	**Digestion is completed.** The small food molecules are absorbed into the blood.
Large intestine	**Water is absorbed** from the undigested food. What is left forms faeces.
Rectum, anus	Faeces are stored in the rectum and leave the body through the anus.
Liver	Makes bile, which helps to digest lipids in the small intestine. Food never enters the liver.
Pancreas	Makes a juice full of enzymes, which flows into the small intestine. Food never enters the pancreas.

7. Enzymes

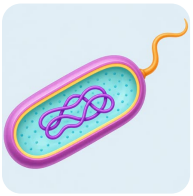


- **Enzymes** are biological catalysts: they speed up the chemical reactions of digestion. An enzyme is not used up. Saliva, the juices in the stomach and the juice from the pancreas all contain enzymes.
- Molecules of starch, protein and lipid are too big to pass through the wall of the small intestine. Enzymes break them into small molecules, which pass into the blood.

8. Absorbing food



- The small intestine is lined with millions of tiny **villi**. They give it a very large **surface area**, so that food is absorbed quickly.
- The wall of a villus is one cell thick, so molecules have a short way to go.
- Blood in the capillaries of each villus carries the food away.



9. Helpful bacteria

- Trillions of bacteria live in the gut, mostly in the large intestine. Most of them are helpful.
- They help to break down food that your own enzymes cannot digest, such as fibre.
- Some make vitamins, such as vitamin K. They also make it hard for harmful microorganisms to grow.

Key words

Balanced diet: eating the right amount of each nutrient, with fibre and water

Protein: the nutrient used to build new tissue for growth and repair

Dietary fibre: parts of plants that cannot be digested

Starvation: taking in far too little energy for a long time

Enzyme: a substance that speeds up the chemical reactions of digestion

Large intestine: where water is absorbed and faeces are formed

Carbohydrate: the body's main source of energy: starch and sugars

Vitamins: needed in small amounts, and named with letters such as A, C and D

Kilojoule: the unit of energy on a food label

Obesity: having so much stored body fat that it can harm health

Stomach: a bag where food is mixed with acidic juices

Villi: tiny finger-shaped bumps that line the small intestine

Lipid: a fat or an oil, which the body can store for energy

Minerals: needed in small amounts: iron and calcium are two of them

Deficiency disease: an illness caused by too little of one vitamin or mineral

Digestion: breaking large food molecules into small ones

Small intestine: where digestion is completed and food is absorbed into the blood

Gut bacteria: microorganisms that live in the intestine and help to break down food

The pictures are illustrations made for this sheet, not real photographs.