Food and health

1 **Tick the "food facts" you think make scientific sense.**

- ☐ Fish is good for the brain, because it contains phosphorous which is supposed to improve memory.
- ☐ Take vitamin C and it will prevent you from catching a cold.
- ☐ Eat fruit between meals and not at meals.
- ☐ Eat fruit with the peel on, because the peel is supposed to contain the greatest amounts of vitamins.
- ☐ Cane sugar and honey are better for you than 'white poison' or refined sugar.
- ☐ Eating red meat, preferably only lightly cooked, 'makes' red blood.
- ☐ Lemon juice disinfects raw shellfish.
- ☐ Yoghurt is a panacea.

A healthy balanced diet can be achieved by eating sufficient amounts of each of the following types of nutrients: protein, fat, carbohydrate, fibre, vitamins, minerals and water.

Protein is needed to build new body cells. Children and teenagers require protein so that they can grow. Adults need protein because it is used to repair and replace cells. Without protein we would not be able to replace cells like red blood cells that have a limited life. Cells that have worn out or are damaged could not be replaced. Our bodies are constructed from thousands of different proteins, each with a different job to do. Some proteins form an important part of the body's structure. For example, keratin is a tough hardwearing protein that makes up our skin, hair and nails. Other proteins called enzymes control the chemical reactions in our cells.

Fat provides a concentrated source of energy which can be stored easily in the body. We have special fat storage cells that form a layer beneath the skin surface. The subcutaneous fat is particularly useful in cold climates. A fat layer also surrounds certain organs such as kidneys and eyeballs. It cushions them against severe knocks and reduces the chance of damage. Fat is needed to build new cell membranes. Finally, we need a certain amount of fat to provide us with the fat soluble vitamins A and D. There are two types of fat: saturated and unsaturated. Unsaturated fats contain a lot of double bonds in their chemical structure which make them more reactive. Many scientists believe that saturated fat (which does not have double bonds) is the main culprit in the diet responsible for heart disease. Red meat, cheese, butter and cream have large quantities of saturated fat. It seems that if we reduced our intake of saturated fat and switched to unsaturated fat, we could improve our health.

Carbohydrates include two very different food types: sugar and starch. Sugar has a limited value in the diet and can cause health problems. Starchy foods, sometimes called complex carbohydrates, such as rice, bread, pasta and potatoes, are important in the diet because they can provide a good source of fibre. Carbohydrates give us energy. Starchy foods are preferable to sugars as an energy source. Sugary foods such as sweets, cakes and jams can easily stick between the teeth. Bacteria grow on them and produce acid, causing tooth decay. Someone who includes a lot of sugar in their diet is more likely to be overweight (obese) and suffer health problems as a result.

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Fibre is only found in plant food. Food from animals such as meat and dairy produce contains no fibre at all. The fibre in plants forms the tough cellulose cell walls. The highest quantities of fibre are found in the husks of cereal grains and the skin of fruits and vegetables. This is why brown rice and wholemeal flour have a higher amount of fibre than white flour and white rice. Although fibre does not give us energy or nutrients, its bulk is very important. It gives the intestine wall muscles something solid to push against. This speeds up the passage of food through the body. Toxic waste products that are sometimes made by certain bacteria in the intestine are removed more rapidly. Fibre is also an important part of a slimming diet. It helps to fill the stomach and prevent hunger pangs without adding calories.

Vitamins are complex chemical substances that our cells cannot make themselves. We have to include them in our diet. They are only needed in tiny quantities but without them many chemical reactions in our cells could not take place. Someone whose diet lacks a particular vitamin will suffer from a deficiency disease. We can make sure that we have enough vitamins by eating a variety of different foods including fresh fruit and vegetables.

Minerals are simple chemicals needed for many of the body's activities. We only need small amounts of them to function properly, as with vitamins.

Water is essential for our survival. We would die within a few days if we did not have water, yet we can survive for several weeks without food. Water forms about 65% of our total mass. Our blood is about 90% water. Water in cells is the solvent that allows vital chemical reactions to take place.

(from Stone-Andrews-Williams, *Examining GCSE – Science*, Stanley Thornes Ltd)

2 Answer these questions.

1. What nutrients must be present in a healthy diet?
2. What is protein needed for?
3. What is fat used for?
4. What makes unsaturated fat more reactive than saturated fat?
5. What foods contain large quantities of saturated fat?
6. Why should we reduce our intake of saturated fat?
7. Why is it important to include starchy foods in a healthy diet?
8. What is the nutritional value of carbohydrates?
9. Why is it important to eat fibre?
10. Why do we have to include vitamins in our diet?
11. What are minerals needed for?
12. What is the percentage of water in our bodies?



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3 Ask suitable questions to these answers.

1. Everybody needs it for the building and the replacement of body tissues.
2. It is a protein which makes up our skin, hair and nails.
3. Because it gives the body extra insulation to protect it from freezing temperatures.
4. They include sugars and starch.
5. Because they stick between the teeth where they favour the growth of bacteria.
6. In plant food only.
7. Because it fills the stomach preventing hunger pangs.
8. They are contained mainly in fresh fruit and vegetables.
9. It is the solvent which allows biochemical reactions in our body cells to take place.

4 Match words in list A with words in list B into meaningful compounds / pairs to complete the definitions.

A: balanced • blood • deficiency • eye • hard • heart • hunger • over • red • slimming • subcutaneous • tooth • waste • whole

B: ball • cell • decay • diet (2) • disease (2) • fat • meal • meat • pangs • products • wearing • weight

1. A ..... is a food regime which includes all the required nutrients in the right proportions.
2. A ..... is a microscopic unit which makes up the red liquid flowing through the body of humans and animals.
3. ..... means 'able to stand much use'.
4. ..... is a greasy substance found under the skin in animal bodies.
5. The ..... is the round part of the eye within the eyelids and socket.
6. ..... is an illness affecting the muscular organ that pumps blood through the body.
7. ..... includes beef, lamb and mutton.
8. ..... is colloquial for dental caries.
9. Being ..... means being too fat.
10. ..... is flour made from the whole grain of wheat, including the husks.
11. ..... are refuse.
12. A ..... is a food regime followed to lose weight.
13. ..... are sharp feelings of pain caused by lack of food.
14. ..... is an illness caused by a lack of a sufficient quantity of vitamins or other nutrients in the diet.

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