

## S1. Diabetes mellitus

In this text-based activity pupils are given a simple introduction to **diabetes** and are asked to carry out some research.

The answers to the questions *cannot* be found on the sheet, the pupils will have to undertake a literature search.

*Answers to the questions on Pupil activity sheet S1:*

1. 16 correct foods appear in the pack of playing cards from the introductory section of this resource.
2. 15 correct foods appear in the playing cards from the introduction section of this resource.
3. starch
4. glycogen
5. The most well known ones are saccharin, aspartame and acesulphame K. Others may be found in the full list of additives and E-numbers which features in the reference material of this resource.
6. Insulin is a protein which will be digested and, hence, broken down into its constituent amino acids if taken orally.
7. adrenalin
8. Tooth decay (dental caries) is caused by bacteria. The bacterial enzymes break down sugary and starchy foods in the mouth and produce acids as by-products. Acids dissolve the calcium salts in the teeth forming cavities.

**KS3**  
*science and food technology*

**Timing - 15 - 25 minutes**  
*depending on the resources available*

*Pupil activity sheet S1 accompanies this activity.*

Diabetes is a condition in which people are unable to control the amount of **glucose** that is in their blood. Glucose is a simple sugar. It belongs to the group of nutrients called **carbohydrates**.

All of the cells in your body need a constant supply of glucose. When you are exercising, the cells in your muscles will need a greater supply than normal. Glucose is used in the process known as **respiration**. This process produces energy.

The amount of glucose in your blood is controlled by special substances called hormones. The hormones that control the amount of blood glucose are called insulin and glucagon. Diabetes happens if a person is unable to produce insulin. Without insulin the cells of your body are unable to use glucose. Some of the first symptoms of diabetes include lethargy (extreme tiredness), thirst and the presence of glucose in the urine. The disease can lead to serious problems. In some cases it can be fatal.

**Diabetics** (people who have diabetes) have two main ways in which they can correct the problems due to this condition. Some of them can lead a normal life simply by keeping a tight check on the amount of carbohydrate they eat. Other diabetics have to have regular injections of insulin as well as being careful of the amount of carbohydrate they eat.

It can be seen that it is very important for diabetics to know how much carbohydrate is in the food they eat. It is very easy for them to eat too many sugary foods.

Some food companies have produced **artificial sweeteners**. Their availability is very helpful to diabetics. The sweeteners can be used in the production of foods such as jams, chocolate and drinks. They can also be used in baking. Artificial sweeteners are sweet tasting substances but they do not add to the amount of glucose in the bloodstream. Artificial sweeteners are useful because they can also be used to produce foods to be included in a weight reducing diet. Their use in fizzy drinks, for example, can also help in the battle against tooth decay.

## Task

**Find out** the answers to the following questions. You will have to research the answers; none of them can be found on this sheet.

1. Find the names of four foods which have less than 5 g of carbohydrate per 100 g of food.
2. Find the names of four foods which have more than 40 g of carbohydrate per 100 g of food.
3. What is the name of the storage carbohydrate in plants?
4. What is the name of the storage carbohydrate in animals?
5. Find the names of two artificial sweeteners.
6. Why does insulin have to be injected into the blood rather than taken by mouth?
7. Find the name of the hormone which is produced in times of stress. It makes your heart beat faster and is a favourite of sports commentators!
8. What is the sequence of events that leads to tooth decay?