Section 11 Summary

11.1 Elements In The Body

a) A **balanced diet** provides the body with all the essential elements and compounds for healthy living.

b) The major constituent **elements found in the human body** are:
- carbon
- hydrogen
- oxygen
- nitrogen

c) Most compounds in the body contain the element **carbon**.

d) Elements are present in the diet and in the body as chemically joined-up compounds and not as the free elements.

e) Essential compounds necessary for a healthy diet include:
- carbohydrates
- fats
- proteins.

f) More than **60% of body weight** is made up of **water**.
- between 60% – 70% of body weight is water.

g) **Minerals** supply the body with small quantities of
- calcium for bones and teeth
- iron for the blood
- small amounts of other trace elements.

h) Some **trace elements** are toxic if taken in too large quantities.

Summary 11.2

Section 11 Summary

11.2 Different Carbohydrates

a) **Carbohydrates** form an important class of food made by plants
- plants store carbohydrates as a food supply

b) Carbohydrates are used by the body to **produce energy**.

c) **Carbohydrates** are compounds which contain the following elements:
- carbon
- hydrogen
- oxygen.

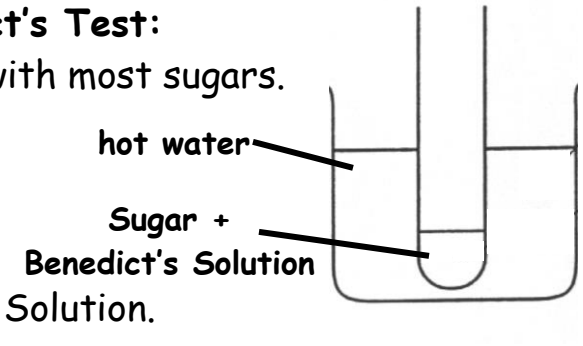
d) Carbohydrates can be divided into **sugars** and **starch**.

e) There are many **different sugars**:
- glucose
- fructose
- maltose
- sucrose (table sugar).

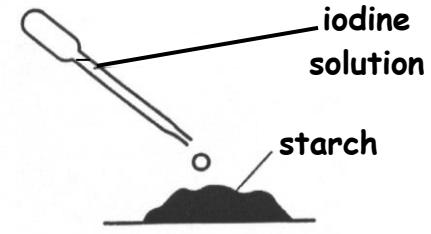
f) Most sugars can be detected by the **Benedict's Test:**
Benedict's Solution turns *brick red/orange* with most sugars.
- glucose
- fructose
- maltose

} react with Benedict's solution

- sucrose does not react with Benedict's Solution.



g) Starch can be distinguished from other carbohydrates by the **iodine test**:
- Iodine turns starch *blue/black*
- No sugars react with iodine



h) Starch and sugars have *different properties*:

Carbohydrate	Taste	Solubility	Size of Molecule
Sugars	sweet	very soluble	small
Starch	not sweet	not soluble	large

Summary
11.3

Section 11 Summary

11.3 Reactions of Carbohydrates

a) Sugars are carbohydrates with **small molecules**:
- glucose, fructose, maltose and sucrose

b) Starch is a **polymer**
- many glucose molecules linked together to make a long molecule called starch.

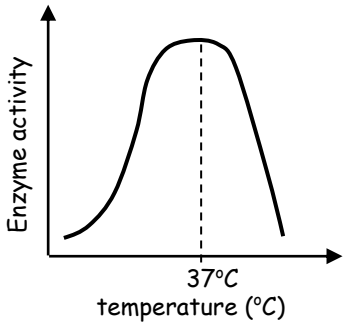
c) Plants join up **glucose molecules into starch** for storing energy:
- plants make glucose by photosynthesis
- glucose molecules join together to be stored as starch

d) Starch is broken down during **digestion**:
- starch is eaten and broken back down into glucose
- glucose carried around body in the blood
- all parts of body use glucose to make energy (respiration)

e) **Digestion** is the process where:
- food is eaten
- broken down into small molecules
- small molecules are absorbed into the body

f) Starch can be **broken down** by:
- acid in the laboratory
- enzymes in your body at 37°C

g) Body **enzymes** work best at body temperature (37°C)
- enzymes are destroyed at higher temperatures.



Summary
11.4

Section 11 Summary

11.4 Fats and Oils

a) **Fats and oils** form an important class of food
- obtained from eating both plants and animals.

b) Fats and oils are much more **concentrated sources of energy** than carbohydrates.
- fats and oils provide the body with energy
- 1g of fat provides more energy than 1g of carbohydrate

c) Fats and oils can be detected by a **filter paper test**:
- rub food with filter paper
- fats and oils leave an *oily stain on filter paper*

d) **Saturated Fats**:
- increase the cholesterol level in your blood
- may eventually cause heart disease and heart failure

e) **Polyunsaturated Fats**:
- considered to be less potentially harmful to the heart.

f) Medical opinion suggests
- total fat consumption should be reduced by eating less fat
- foods high in polyunsaturates should be eaten where possible instead of saturated fats

Summary
11.5

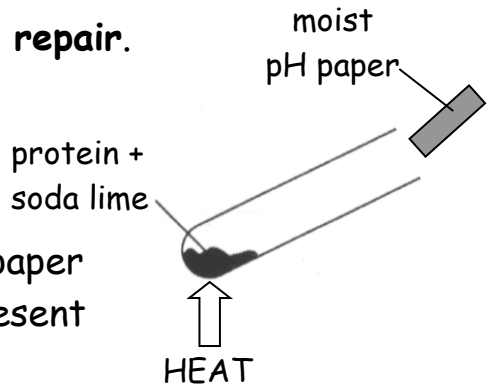
Section 11 Summary

11.5 Proteins

a) **Proteins** form an important class of food:
- obtained from eating both plants and animals

b) Proteins provide material for **body growth and repair**.

c) Proteins can be detected:
- heating with soda lime
- testing for an alkaline gas with moist pH paper
- *moist pH paper turns blue* if protein is present



d) Proteins are chemical compounds containing the elements:
- carbon
- hydrogen
- oxygen
- nitrogen (only protei**n**s contain **n**itrogen)

e) Proteins are **polymers**:
- many amino acid molecules join together to make proteins
- animals make particular proteins in their bodies for specific purposes.

f) The **amino acids** required to make animal proteins are obtained from eating animal and vegetable foods.

g) During **digestion** proteins from food are broken back down into amino acids again.

h) A **vegetarian** diet must include a wide variety of vegetables to supply all the necessary amino acids.

Summary
11.6

Section 11 Summary

11.6 Fibre,Vitamins & Food Additives

a) **Fibre** keeps the gut working well, preventing or reducing constipation.

b) Fibre **absorbs water and swells**:

- this provides bulk for the gut muscles to work on as food is squeezed along intestines.
- prevents constipation

c) **Vitamins** are complex carbon compounds:

- vitamins are required to keep the body healthy
- lack of important vitamins can cause poor health.
  e.g. lack of vitamin C causes the disease Scurvy

d) **Food additives** can be used to:

1. supply or enhance the nutritional value of food
   e.g. vitamins and minerals

2. improve the keeping qualities of food
   e.g. food preservatives

3. alter the appearance of food
   e.g. food colouring

4. alter the flavour of food
   e.g. food flavouring such as sweetner

e) Food additives can be used only if they have been **tested and approved**.