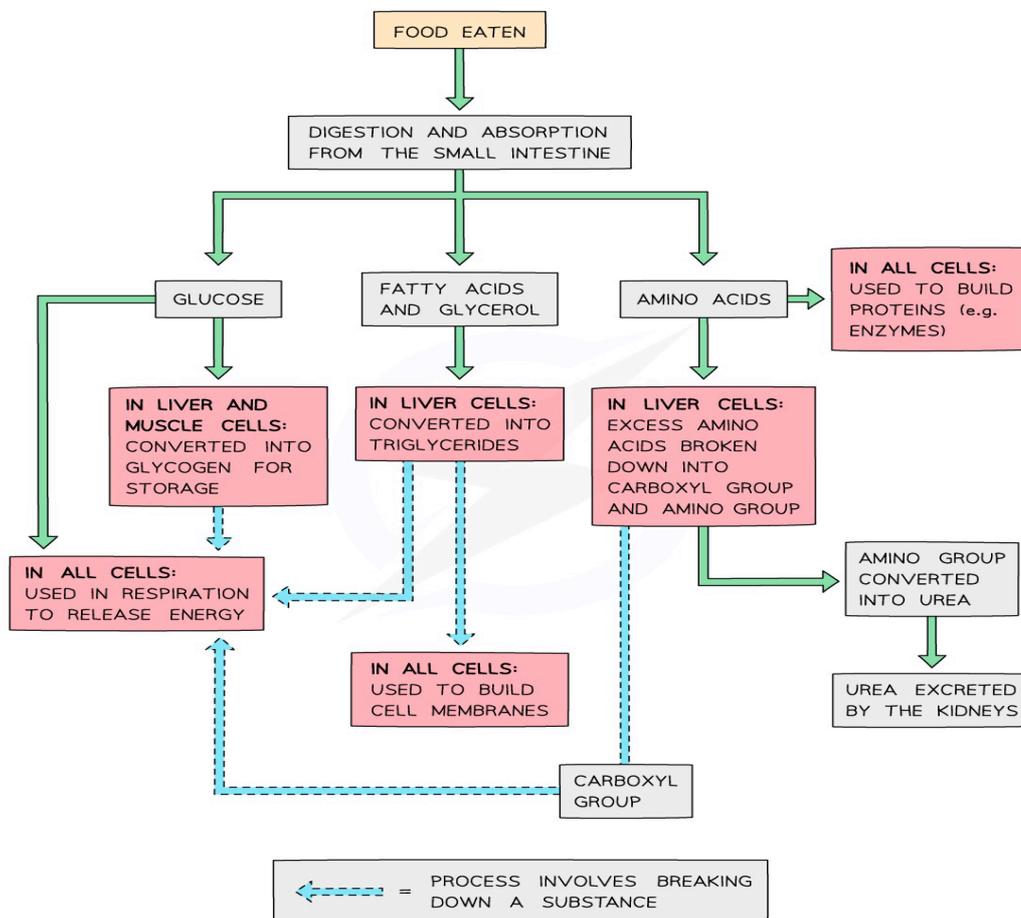


Metabolism

Metabolism

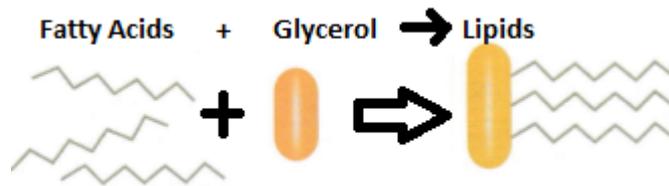
- Metabolism is the sum of all types of chemical reaction that take place in the body.
- Metabolic reactions include the synthesis and breakdown of carbohydrates, lipids and proteins
 - **Glucose** (a sugar) is used in the synthesis of starch, glycogen or cellulose
 - **Fatty acids and glycerol** are used in the synthesis of lipids
 - **Amino acids** are used in the synthesis of proteins



- The two types of metabolic reaction are:
 - Anabolic (building reactions)
 - Catabolic (breaking down reactions)

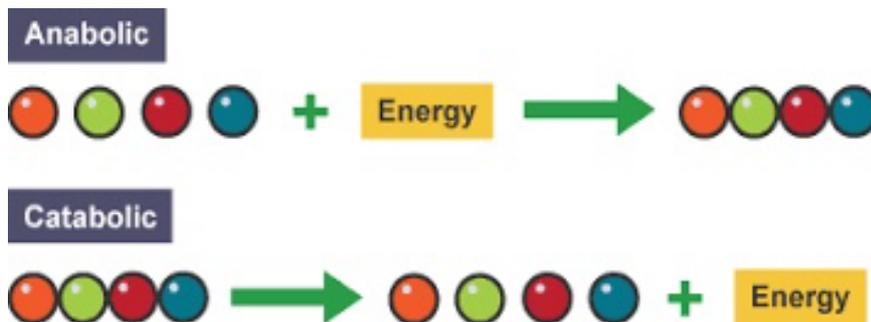
Anabolic reactions

- In order to occur anabolic reactions require the input of energy. Examples of anabolic reactions include:
 - The formation of amino acids in plants (nitrate ions and glucose) which are built up into proteins.
 - Converting glucose into starch in plants, or glucose to glycogen in animals.
 - The synthesis of lipid molecules.



Catabolic reactions

- Catabolic reactions release energy. Examples of Catabolic reactions include:
 - Respiration
 - Breaking down amino acids to form urea, which is then excreted
- Catabolic reactions produce waste energy in the form of heat (an exothermic reaction), which is transferred to the environment.



Metabolism in plants

Build up of molecules in plants(Anabolic Reaction)

- Glucose is made by plants during photosynthesis. Plants are then able to make larger, more complex molecules with glucose.
- The metabolism of glucose in plants after it has been produced during photosynthesis.

- It shows that glucose is used:
 - to make starch and cellulose
 - in the process of respiration
 - to make amino acids and therefore then proteins
 - to make lipids (fats and oils)

Breakdown of molecules in plants (Catabolic Reaction)

- Plants are also able to breakdown the larger, more complex molecules they have made to make glucose.
- The metabolism of glucose in plants showed - how glucose can be made from starch, lipids and amino acids, and is used in the process of respiration.

Metabolism in animals**Build up of molecules in animals (Anabolic Reaction)**

Animals obtain glucose in their diet. During metabolic reactions, animal cells use glucose:

- in the process of respiration
- to make glycogen which is stored in the liver and muscle cells
- to make lipids from fatty acids and glycerol
- to make proteins from amino acids

Break down reactions in animals (Catabolic Reaction)

All cells require glucose for respiration. Animals can convert glycogen into glucose when they need a short term supply of energy and they have run out of glucose. After animals have broken down all its glycogen, they will breakdown lipids and then proteins to supply the glucose needed for respiration.

