

Biology Revision Guide

Normanhurst School

Year 8



Contents

- Food & digestion
- Respiration
- Microbes & disease
- Ecological relationships

Biology Revision Guide

Food & Digestion

There are 6 different nutrients in food:

- Carbohydrates
- Fat
- Protein
- Minerals
- Vitamins
- Fibre.

Water is essential but is not considered a nutrient.

- Carbohydrates: an immediate source of energy
- Fat: a long-term energy store and vital for cell membranes
- Protein: for growth & repair of tissues
- Fibre: needed to keep waste moving through your digestive system.

Minerals

- Only needed in small amounts
- Iron: helps the blood carry oxygen
- Sodium: keeps nerves & muscles working properly
- Calcium & phosphorus: makes teeth & bones strong.

Vitamins

- Only needed in small amounts
- Vitamin A: keeps skin healthy
- Vitamin B: keeps nerves healthy
- Vitamin C: keeps gums & skin healthy
- Vitamin D: keeps teeth & bones strong.

Digestion

- Food must be broken down so that it is small enough to enter your body
- The process is called digestion
- Mechanical digestion uses teeth to make food smaller
- Chemical digestion uses enzymes to break food down.

Enzymes

- Enzymes break down large molecules into smaller molecules
- Amylase breaks down starch into glucose
- Protease breaks down protein into amino acids
- Lipase breaks down fats into fatty acids.

Absorption

- Every cell in your body needs the 6 nutrients
- Nutrients are carried around your body by the blood
- The nutrients must be smaller enough to get into your blood from the digestive system
- This process is called absorption.

Respiration

How does burning fuel release energy?

- Fuel + oxygen \rightarrow CO₂ + H₂O + heat energy

How do your cells get energy?

- Respiration is a slow burning process in cells
- Glucose + oxygen \rightarrow CO₂ + H₂O + energy for the cell.

Every cell needs:

- Oxygen
- Glucose.

Every cell must get rid of waste products:

- Carbon dioxide
- Water.

How does oxygen get to your cells?

- The blood carries oxygen to your cells
- Oxygen enters your blood through the lungs
- Your lungs contain millions of air sacs (alveoli)
- Oxygen enters the blood through the alveoli.

Alveoli & gaseous exchange

- The walls of each alveolus is very thin to let gases through
- Tiny blood vessels (capillaries) surround the alveolus
- The lining of the alveolus is moist to absorb oxygen.

Gaseous exchange

What makes the gases move through the alveoli?

- There is more oxygen in the alveoli than in the blood so oxygen diffuses into the blood
- There is more CO₂ in the blood than in the alveoli so the CO₂ moves into the alveoli.

What is in blood?

- Red blood cells: carry oxygen around the body, delivering oxygen to the cells
- White blood cells: defend the body from infections
- Plasma: water base liquid that dissolves and carries CO₂ and water from cells and carries red & white blood cells.

The circulatory system

- The heart pumps blood around the body
- Arteries are blood vessels that take blood from the heart
- Veins return blood to the heart
- The mass of blood vessels are tiny capillaries that take the blood to every cell of the body.

The heart is a double pump

- One pump pushes blood through the lungs to pick up oxygen
- The other pump sends the blood around the rest of the body delivering nutrients and glucose to every cell.

Plants also respire

- Plants produce oxygen by photosynthesis using sunlight during the day
- At all times, however, they use oxygen in respiration
- During the day they produce more oxygen than they use
- At night they use more oxygen than they produce.

Microbes & disease

Microorganisms

- Microorganisms (or microbes) are tiny organisms
- They feed, grow and reproduce like all other organisms
- Some microbes are useful
- Some microbes are harmful.

There are 3 main groups of microbes:

- Viruses
- Bacteria
- Fungi.

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Viruses:

- Can only be seen with very powerful microscopes
- They contain genetic information surrounded by a protein coat
- They can take over cells for their own use
- They can release poisons into their hosts.

Bacteria

- Bacteria are larger than viruses
- They are single-cell organisms
- They multiply quickly inside their host
- They can produce toxins (poisons) that can harm their host
- Some bacteria are useful in food production & industry.

Fungi

- Range in size from very small to very large
- They can release toxins and harm organisms
- They can be useful (e.g. yeast for making bread and alcohol).

Ecological relationships

Classifying green plants:

- Mosses & liverworts (Bryophyta)
- Conifers (Coniferophyta)
- Ferns (Filicinophyta)
- Flowering plants (Angiospermophyta).