Biology Revision Notes – Cells And Respiration

1. Cells are the smallest part of an organism. There are **plant cells** and **animal cells**.
2. Animal and plant cells have:
   - **Cell membrane** – allows food and water into the cell and waste out. It holds the cell together.
   - **Nucleus** – the control centre of the cell.
   - **Mitochondria** – where respiration takes place.
   - **Cytoplasm** – a 'jelly-like' liquid where cell processes take place (through organelles).

   Plant cells also have:
   - **Cell wall** – supports and protects the cell. Made of cellulose.
   - **Cell vacuole** – keeps the cell rigid (turgor pressure). Stores dissolved foods and chemicals.
   - **Chloroplasts** – where photosynthesis takes place.
3. **Specialised cells** are designed for a specific function (e.g. nerve cells, red blood cells etc.)
4. Cells go together to make **tissues**, which go together to make **organs**, which go together to make **organ systems**.
5. **Diffusion** is the movement of liquids/gases from a high concentration to a low concentration.
6. **Osmosis** is the movement of water from a weak solution to a strong solution across a semi-permeable membrane.
7. **Turgid** means bloated, or full of water. **Flaccid** means floppy, or lacking in water.
8. **Active transport** is the movement of minerals or other molecules against a concentration gradient.
9. **Respiration** is the energy producing reaction in cells:

$$6O_2 + C_6H_{12}O_6 \rightarrow 6CO_2 + 6H_2O$$

   Breathing is the process which takes oxygen in and out of the lungs.
10. When you **breathe in**, the intercostal muscles contract and the diaphragm contracts to decrease the volume of air in the chest, reducing the pressure, and forcing air into the lungs.
11. When you **breathe out**, the intercostal muscles relax and the diaphragm relaxes to increase the volume of air in the chest, increasing the pressure, and forcing air out of the lungs.
12. **Gaseous exchange** takes place in the millions of **alveoli** in the lungs, which create a large surface area for respiration. Oxygen diffuses into the blood, and carbon dioxide diffuses out.
13. **Aerobic respiration** is where glucose is used to produce energy in the presence of oxygen.
14. **Anaerobic respiration** is where glucose is used to produce energy without oxygen, producing a by-product of lactic acid.
15. Smoking kills by:
    - Causing lung cancer and other cancers.
    - Causing emphysema.
    - Causing heart disease.
    - Resulting in lighter babies, and the risk of the baby dying increases by 35%.
16. The following chemicals are present in the smoke from cigarettes:
    - **Nicotine** – damages the heart, blood vessels and nerves. Very addictive.
    - **Carbon monoxide** – attaches onto the haemoglobin in blood, so it can't carry as much oxygen, and not as much oxygen reaches the cells in the body.
    - **Tar** – is deposited in the lungs, and can cause cancer.
17. **Mitosis** is the division of a cell into two diploid cells, each containing the full complement of chromosomes (e.g. in a developing baby).
18. **Meiosis** is the division of a cell into four haploid cells (there are two meiotic divisions), each containing half the full complement of chromosomes (e.g. in sperm and egg cells).