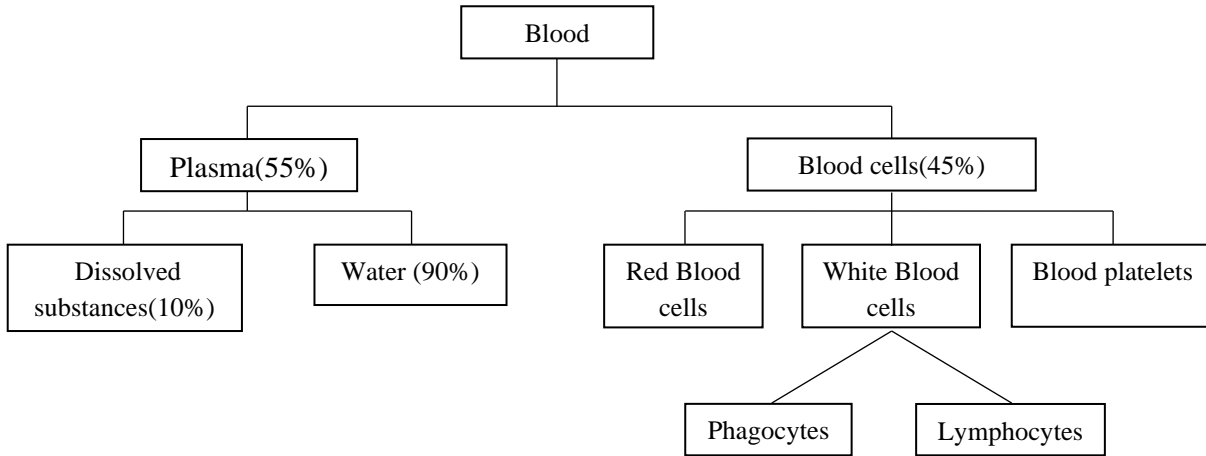


# Biology Short Notes

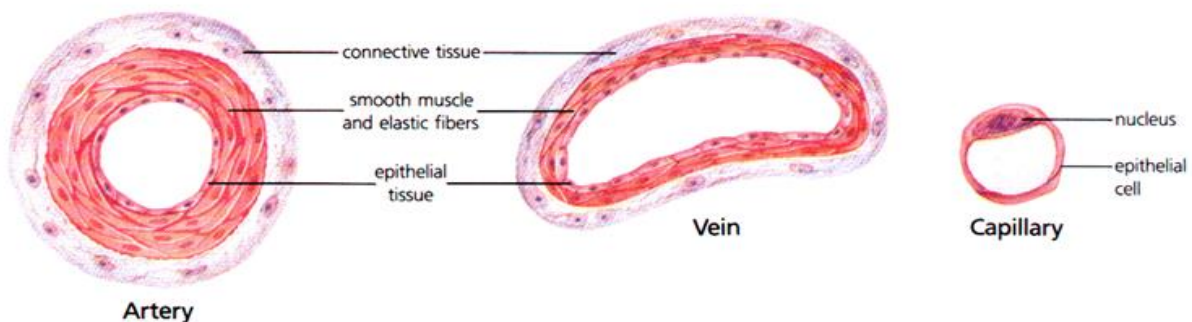
## Day 1/2

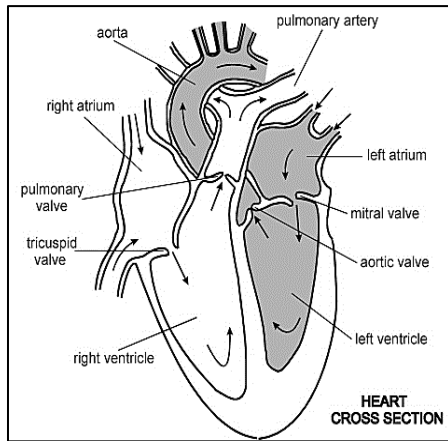
### Chapter 1 : Blood circulatory system

There are 3 types of blood vessels namely (1) arteries (2) veins and (3) capillaries



	Arteries	Capillaries	Veins
Function	Carry blood <b>away</b> from the heart at <b>high</b> pressure	-Supply all cells with their <b>requirements</b> -Take away <b>waste</b> products	<b>Return</b> blood to the heart at <b>low</b> pressure
Structure of wall	- <b>Thick</b> , strong -Contain <b>muscles</b> , <b>elastic</b> fibres and <b>fibrous</b> tissue	<b>Very thin</b> , only one cell thick	- <b>Thin</b> -Mainly <b>fibrous</b> tissue -Contain far <b>less muscle</b> and <b>elastic</b> tissue than arteries
Lumen	- <b>Narrow</b> -Varies with heartbeat (increases as a pulse of blood passes through)	- <b>Very narrow</b> -Just wide enough for a red blood cell to pass through	<b>Wide</b>
Valves	(-)	(-)	(+) Prevent backflow
How structure fits function	-Strength and elasticity needed to withstand the pulsing of the blood, prevent bursting and maintain pressure wave -Helps to maintain <b>high blood pressure</b> , preventing blood flowing backwards	- No need for strong walls, as most of the blood pressure has been lost -Thin walls and narrow lumen bring blood into close contact with body tissue, allowing <b>diffusion</b> of materials between capillary and surrounding tissues. -White blood cells can squeeze between cells of the wall	- No need for strong walls, as most of the blood pressure has been lost - Wide lumen offers <b>less resistance</b> to blood flow





### Functions of

1. **Plasma:** - Act as a medium to carry substances (soluble food substances, carbon dioxide, urea, vitamins)
2. **Red blood cells:** - To carry oxygen from lungs to all part of the body
3. **White blood cells:** - To kill bacteria
4. **Phagocytes :** - To engulf and kill bacteria
5. **Lymphocytes :** - To produce antibodies to kill bacteria.
6. **Platelets :** - To form blood clot at wounds.

### Disease of the circulatory system( cardiovascular disease)

1. Thrombosis – A blood clot forms in an artery. It may result as a heart attack, if occurs at coronary artery.
2. Stroke – Unusual high blood pressure can burst blood vessels inside the brain resulting in stroke.
3. Hypertension – Hypertension is a condition where there is high blood pressure at rest.

### Factors leading to cardiovascular disease.(CHD) Preventive measures for CHD

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. Fat deposit inside arteries.</li> <li>2. Excessive alcohol intake</li> <li>3. Cigarette smoking</li> <li>4. Obesity</li> <li>5. Too much salt in the diet.</li> </ol> | <ol style="list-style-type: none"> <li>1. Reduce intake of saturated fats and cholesterol.</li> <li>2. Do regular exercise</li> <li>3. Reduce salt in diet</li> <li>4. Stop smoking</li> <li>5. Avoid alcoholic drinks</li> <li>6. Avoid obesity</li> <li>7. Avoid stress</li> </ol> |
|---|--|

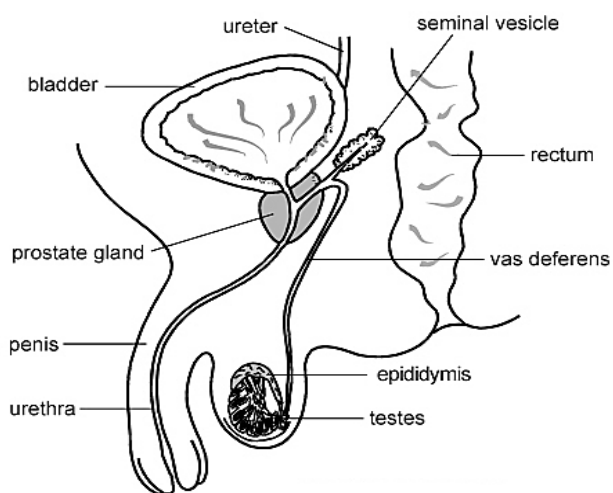
## Day 3/4

### Chapter 2: Reproduction

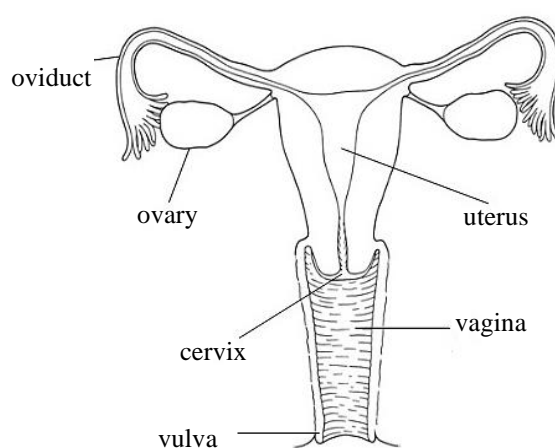
- Reproduction is defined as the process that maintains the continuity of life.
- There are two types of reproduction; sexual and asexual.

Asexual	Sexual
One parent needed	Two parents needed
No gametes needed	Gametes needed
Offspring are genetically identical to each other and to parents	Offspring are genetically different to each other and to parents

- Sexual reproduction is the production of new individual by the fusion of two gametes.
- **Fertilisation** is the fusion of a male gamete and a female gamete.
- **Zygote** is formed when fertilisation occurs.
- The zygote starts to divide repeatedly to form a ball of cells called **embryo**.
- **Implatation** occurs when the embryo attaches itself to the wall of the uterus.



**Male reproductive system**



**Female reproductive system**

Disease	Cause & Transmission	Sign & Symptoms	Treatment & Prevention
Syphilis	Caused by a bacterium and transmitted during sexual intercourse but is more serious than Gonorrhoea	<ol style="list-style-type: none"> <li>1. Painless sore on penis and inside vagina.</li> <li>2. Rashes on mouth</li> <li>3. Fever</li> <li>4. Heart failure</li> <li>5. Paralysis or death</li> </ol>	<ol style="list-style-type: none"> <li>1. Taking antibiotics (penicillin)</li> <li>2. Use of condom.</li> <li>3. Avoid sexual intercourse with different partners</li> </ol>
AIDS (Acquired Immune Deficiency Syndrome)	<ol style="list-style-type: none"> <li>1. Caused by HIV virus.</li> <li>2. Transmitted during sexual intercourse.</li> <li>3. Transfusion of infected blood.</li> <li>4. From infected mother to baby.</li> <li>5. Sharing of unsterilised needles.</li> </ol>	<ol style="list-style-type: none"> <li>1. Severe weight loss.</li> <li>2. Chronic cough and diarrhoea.</li> <li>3. Spots on skin</li> <li>4. Breathless</li> <li>5. Brain infection</li> </ol>	<ol style="list-style-type: none"> <li>1. NO cure so far.</li> </ol> <p><u>Prevented by</u></p> <ol style="list-style-type: none"> <li>1. Use of condoms</li> <li>2. Avoid drug abuse</li> <li>3. Educate public about the spread and precautions to be taken</li> </ol>

## Day 5/6

### Chapter 3: Biodiversity

- **Biodiversity** is the term used to describe the huge variety of life found on earth.
- Importance of biodiversity
  1. Provide man's necessities such as shelter, food, fuel and building materials.
  2. Provide drinkable water, clean air and fertile soil.
  3. Is the source of many medicines.
  4. Provide a source of income for ecotourism.
  5. Beautify and enrich our lives.
  6. Is the habitat of many animals.

- **Threats to biodiversity**

1. Invasive alien species

The introduction of non-native species into an ecosystem can threaten endemic wildlife either as predators or competing for resources.

2. Climate change

- Rapid climate change didn't give enough time for the ecosystem and the species to adapt.
- Rising of ocean and temperatures and diminishing Arctic sea affect marine biodiversity

3. Pollution

- From the burning of fossil fuels (releasing dangerous chemicals into the atmosphere and, in some cases, depleting ozone levels) to dumping 19 billion pounds of plastic into the ocean every year, pollution completely disrupts the Earth's ecosystems. While it may not necessarily cause extinction, pollutants do have the potential to influence species' habits.

- For example, acid rain, which is typically caused by the burning of fossil fuels, can acidify smaller bodies of water and soil, negatively affecting the species that live there by changing breeding and feeding habits.

4. Deforestation and habitat loss.

- Deforestation is a direct cause of extinction and loss of biodiversity.

5. Overexploitation

- Overhunting, overfishing and over-harvesting contribute greatly to the loss of biodiversity, killing off numerous species over the past several hundred years. Poaching and other forms of hunting for profit increase the risk of extinction; the extinction of an apex predator or, a predator at the top of a food chain, can result in catastrophic consequences for ecosystems.

- **Ways to reduce threats of biodiversity**

1. Avoid deforestation

2. Prevent all form of pollution ( Water, air and soil)

3. Sustainable management of fishing and hunting and enforce rules against overexploitation

4. Prevent introduction of invasive species

5. Educate the population about the importance of conservation

6. Recycling materials.

 *Day 7/8* 

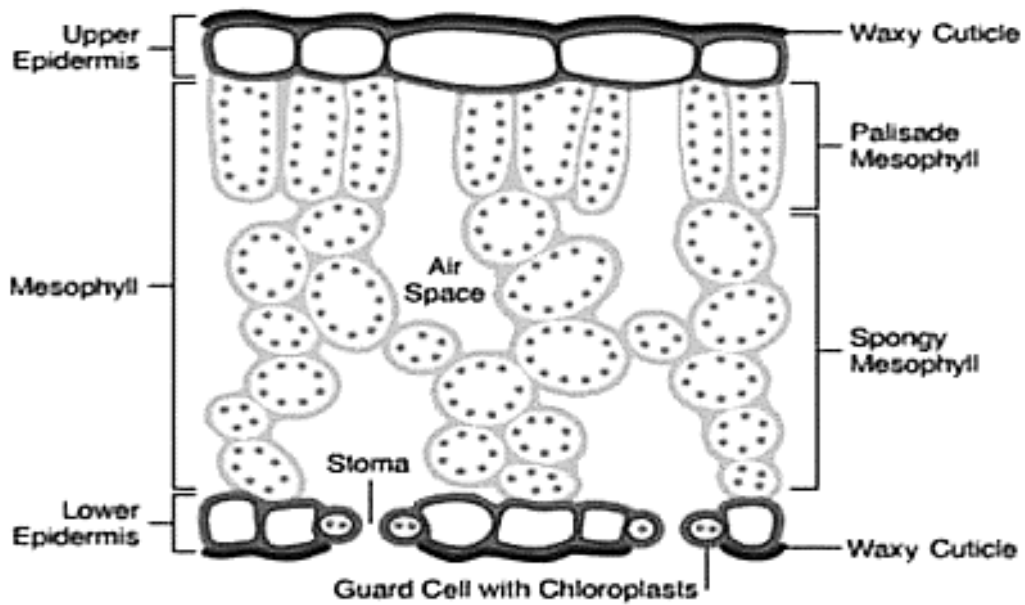
**Chapter 4: Nutrition in plants**

- **Photosynthesis** is the process during which green plants produce sugar (glucose) from carbon dioxide and water in the presence of sunlight and chlorophyll. Oxygen is also produced during the process.

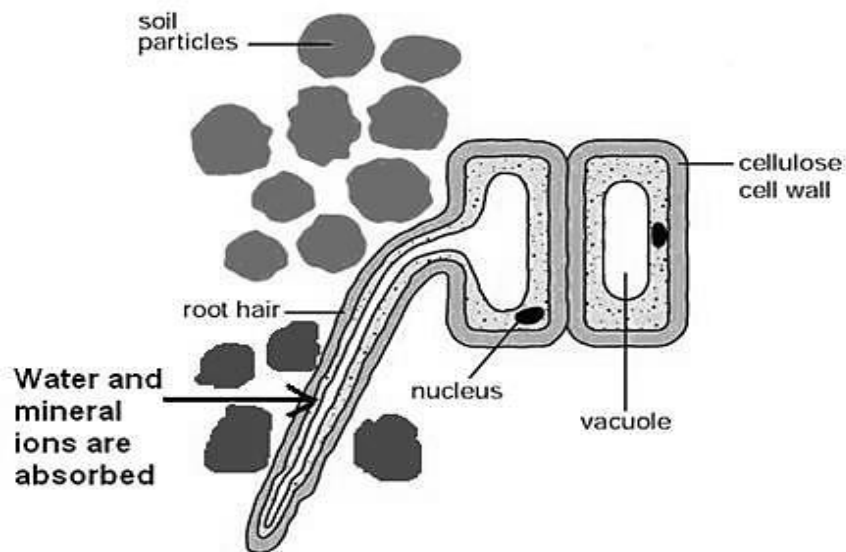


- A leaf is well adapted to carry out photosynthesis; it has a large surface area and is thin to trap light better, contains chlorophyll, has a network of veins and contains stomata to allow gaseous exchange.

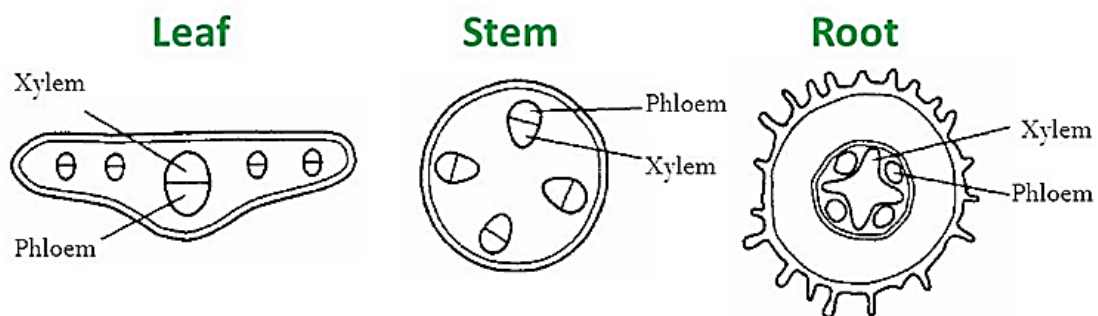
The internal structures of a dicot leaf is shown below:



- Carbon dioxide enters while oxygen leaves the leaf through the stomata by diffusion.
- Water is absorbed by osmosis by the root hair cells. The water is then transported to the leaves by the xylem vessels.



- The vascular bundles are made up of xylem vessels and phloem.
- **Xylem** carries water and mineral salt from the root up the stem to all part the plant
- **Phloem** carries food from the leaves to all part of the plant.



### Investigating the necessarily conditions needed for photosynthesis.

During photosynthesis a plant absorbs light energy using the pigment chlorophyll. This allows it to convert carbon dioxide and water into glucose. This glucose is:

- transported to the growing parts of the plant for use in respiration
- transformed into cellulose, proteins and oils
- turned into starch for storage

Therefore, to test if a plant has been photosynthesising, you can test the leaf to see if starch is present.

#### (i) Starch testing

Iodine solution is used to test leaves for the presence of starch. You need to:

1. heat a plant leaf in boiling water for 30 seconds (this kills the leaf, stopping any chemical reactions)
2. add the leaf to boiling ethanol in a water bath for a few minutes (the boiling ethanol dissolves the chlorophyll and removes the green colour from the leaf - it turns white so it is easy to see the change in colour)
3. wash with water to rehydrate and soften the leaf and spread onto a white tile
4. add iodine solution from a dropping pipette

After a few minutes, the parts of the leaf that contain starch turn the iodine from brown to blue/black.



#### (ii) Importance of chlorophyll in photosynthesis

**Variegated leaves** have green parts (where the cells contain chlorophyll) and white parts (where there is no chlorophyll). Only the parts that were green become blue/black with iodine solution, showing the importance of chlorophyll in photosynthesis. The parts without chlorophyll do not photosynthesise, and so they do not make starch and the iodine does not change colour.



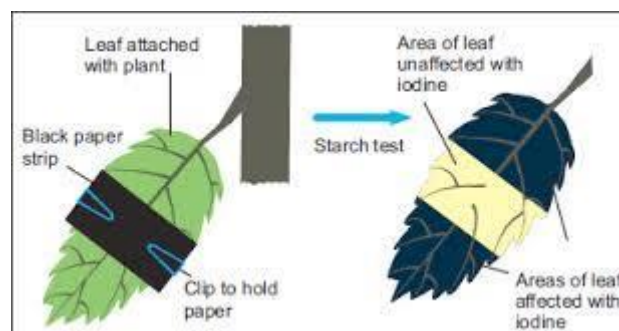
The leaf on the left is a variegated leaf. The green parts contain chlorophyll and photosynthesise to make starch. The white part of the leaf does not contain chlorophyll, so does not photosynthesise.

The leaf on the right shows a positive test for starch in the areas which contained chlorophyll, and a negative test for starch in the areas which lack chlorophyll.

This is evidence that chlorophyll is required for photosynthesis.

### (iii) Importance of sunlight for photosynthesis

A plant can be ‘de-starched’ by leaving it in the dark for a few hours. Parts of its leaves are covered with dark paper, and the plant is left in the light for a few hours. Only the uncovered parts become blue/black with iodine solution, showing the importance of light in photosynthesis.



### (iii) Importance of carbon dioxide in photosynthesis.

To investigate if a plant needs carbon dioxide for photosynthesis, we need to create conditions for the plants where carbon dioxide is present in one test and absent in another. The air contains 0.04% carbon dioxide. Scientists can use sodium hydroxide to absorb carbon dioxide from the air so that it is unavailable for the plants to use in photosynthesis.

In this particular experiment, a de-starched plant is covered using an airtight transparent plastic bag. The chemical sodium hydroxide is placed in the bag with the plant to absorb the carbon dioxide. The plant is left for 24 hours and the leaves are tested for starch using iodine. The leaves will show that no starch has been made as no photosynthesis occurred without carbon dioxide.