

Revision Notes Science 7 ASP

Long Test 1, 1st Term, Academic Year 2023 - 2024

Lesson 1: Levels of Organization

Key Words:

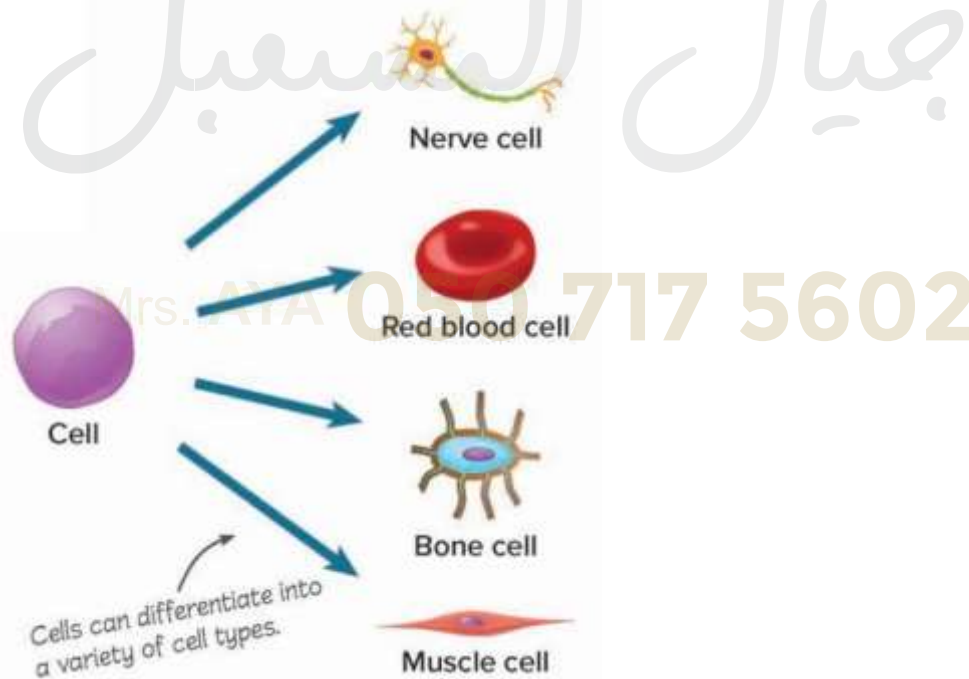
1. **Hierarchy** – arrangement from simple to complex
2. **Cells** – basic unit of living things capable of performing a role/job.
3. **Tissues** – **group of cells** performing a specific role.
4. **Organ** – **group of tissues** performing a specific role.
5. **Organ System** – **group of organs** performing a specific role.
6. **Organism**- **group of different systems** performing complex roles.

Human beings are highly organized from simple to complex following this order:

cell -> tissue -> organ -> organ system -> organism

Cells

- basic functioning unit of living things.
- Cells achieve their roles through **cell differentiation** or **cell division** as shown:



Nerve cell – used for transmitting messages to the brain

Red blood cell – used to carry oxygen around the body

Bone cell – used to produce blood cells

Muscle cell – contracts and relax to allow for any movement

Tissues

- Group of similar cells working together to carry out tasks.
- Can be grouped as animal tissue or plant tissue.

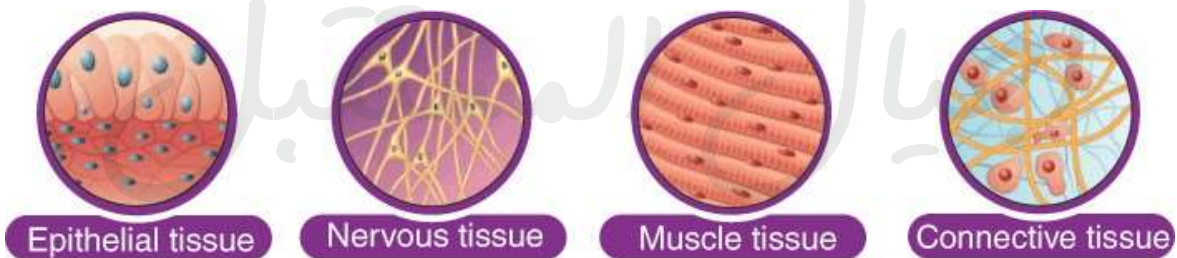
Bone Marrow

- Is a tissue that is composed of bone cells
- **Function:** Produce blood cells

Three types of Blood cells

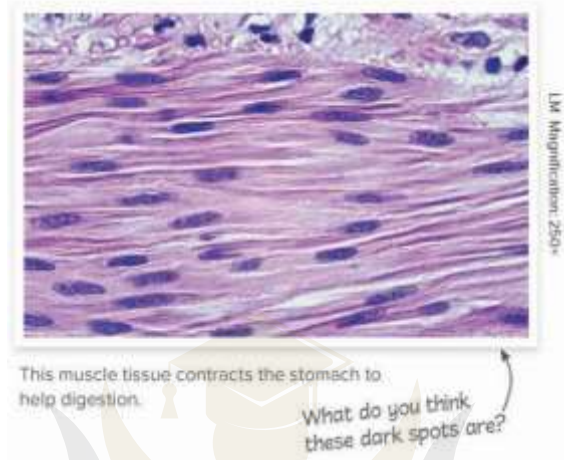
1. **Red Blood Cells** – to carry oxygen in the blood
2. **White Blood cells** – to help fight against bacteria and other microorganisms that make us sick
3. **Platelets** – enable blood clotting when we are wounded

4 Types of Animal Tissues

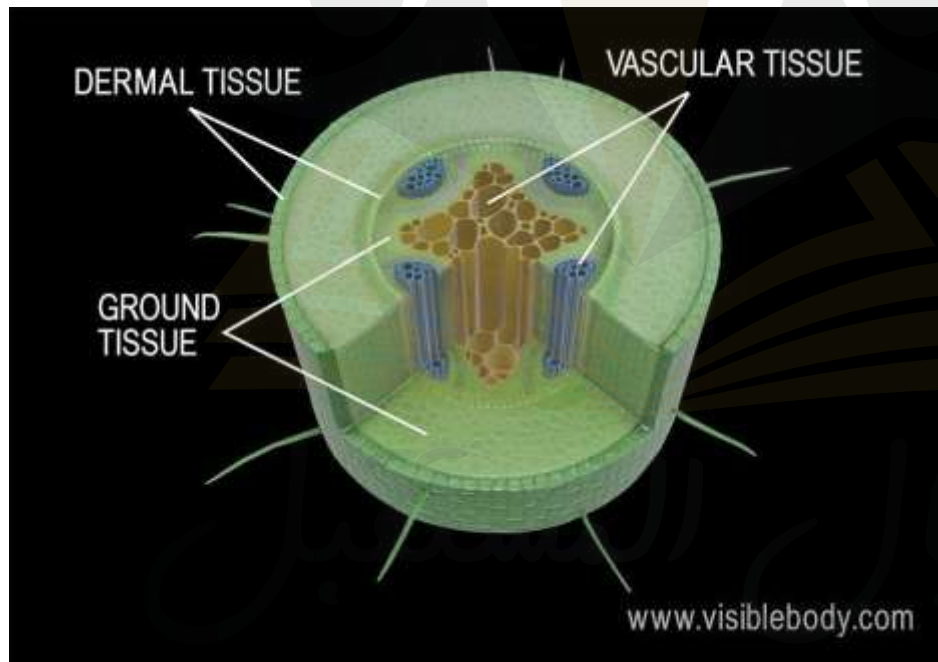


- Epithelial Tissue** – forms the protective layer of the skin and the internal linings of the body such as the lining of the stomach and intestine
- Nervous Tissues** – carries messages to and from the brain
- Connective Tissues** – provides structure and support and connects other tissues together

d. **Muscle Tissue** – contract and relaxes to allow movement of the body.



3 TYPES OF PLANT TISSUES

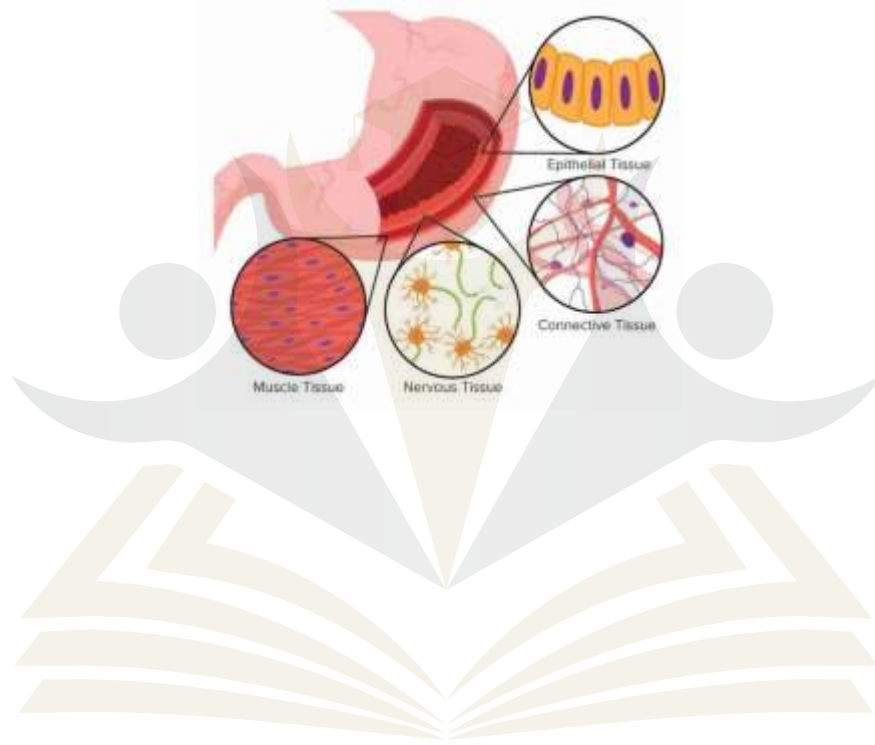


1. **Ground Tissue** – provides storage and support, it is also where photosynthesis (process of making food in plants) happen
2. **Vascular Tissue** – transports water, minerals and sugar around the plants
3. **Dermal Tissue** – provides protection and prevents water loss in the leaves

ORGANS

- Group of tissues performing a particular job.

Example: Stomach is an **organ** composed of **epithelial tissue, connective, nervous, and muscle tissue.**



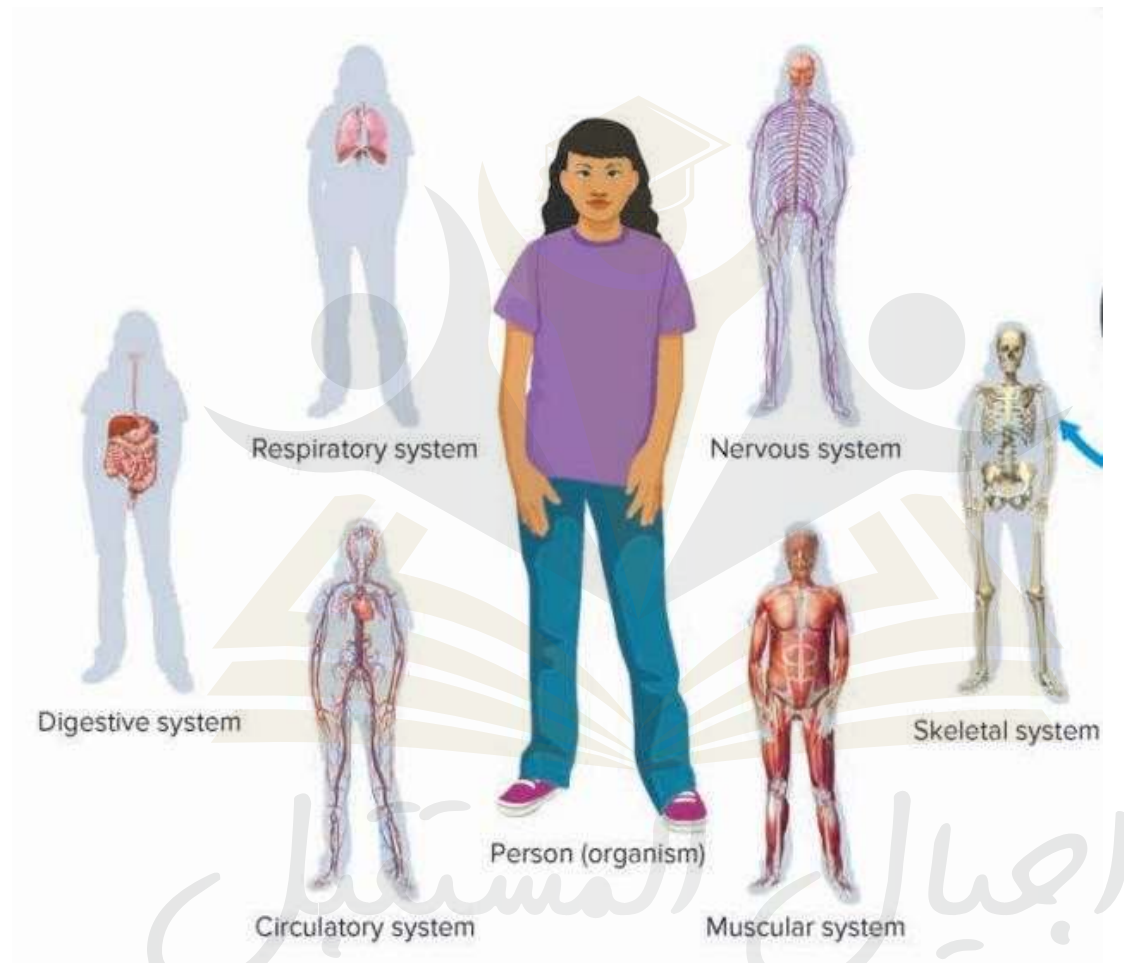
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ORGAN SYSTEM

- Group of different organs working together to perform a specific role.

HUMAN ORGAN SYSTEMS



Example of Organization from simple to complex

Bone cell → bone tissue → bone → skeletal system

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ORGAN SYSTEMS	FUNCTIONS
Skeletal System	Provides support, protection, and for production Includes organs such bones, joints, cartilage, bonemarrow
Muscular system	Point of attachment of bones, and allowsfor body movement Includes all muscles like biceps and triceps
Digestive System	Breaks down food from complex to simple molecules Includes organs such as: mouth, esophagus, stomach, small and largeintestine, anus
Respiratory System	Allows for the exchange of gases (oxygenin and carbon dioxide out) Includes organs: mouth & nose, trachea, bronchi, bronchioles, lungs,
Circulatory System	Transports materials around the body such as oxygen, nutrients and waste products Includes the organs heart, blood and blood vessels
Nervous system	The control center of the body which is used for reception and transmission ofany information to and from the brain Includes the organs brain and the spinal cord
Immune System	Protects us from any disease-causing organisms such as bacteria and virus Includes the skin and even blood

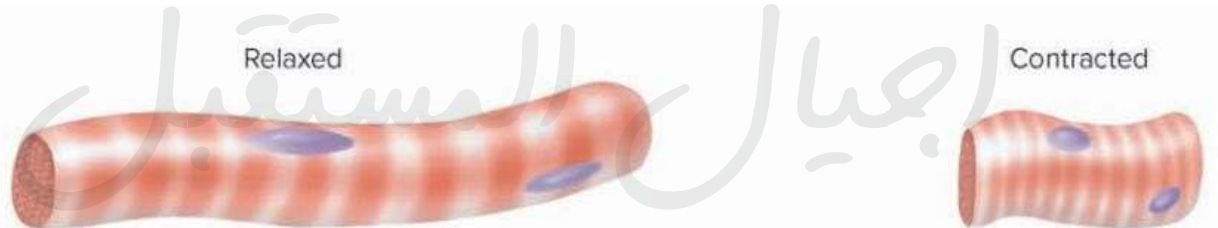
Lesson 2: Structure and Support

Key Words:

1. **Muscle** – a tissue that is able to contract and relax to allow movement
2. **Joint** – place where two bones meet
3. **Ligament** – tissue that connects bones to bones
4. **Tendon** – connects muscles to bones
5. **Hydrostatic skeleton** – skeleton found in invertebrates such as earthworm, sea anemone
6. **Endoskeleton** – inside skeleton usually for mammals, birds, reptiles
7. **Exoskeleton** – hard shell covering present in insects and some arthropods
8. **Smooth muscles** – muscles that we are not able to control
9. **Skeletal muscles** – also called as voluntary muscles because they can be controlled
10. **Cardiac muscle**- special muscle located in the heart ONLY

MUSCLES

- Are tissues that contract and relax to allow movement of the bones
- When a muscle contracts, it gets shorter; if the muscle relaxes, it will get longer as shown by the diagram:
- The **muscles have a lot of mitochondria** which provide energy to be able to do a work.



You might recall that mitochondria are the main energy producers in a cell. Because so much energy is required for muscle function, muscle cells are packed with mitochondria.

- **Athletes such as runners** have a lot of mitochondrion in their legs
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ROLE/FUNCTION OF THE SKELETON:

1. **For structure and support and shape** (e.g. skeleton provides framework for the body)
2. **For protection of internal organs** (e.g. skull protect the brain; ribcage protects the heart and the lungs)
3. **For production** (e.g. bone marrow produces red blood cells and white blood cells)

SKELETON

- Composed of **bones, joints, ligaments, cartilage, and tendons.**
- Bones are living tissues that need minerals like **calcium for growth**
- Humans have 206 bones but babies have 350 bones
- Bones fuse together until they reach 206 during adulthood.

JOINTS & LIGAMENTS

- **Joint** is where two bones meet while **ligaments** are tissues that connect bones to bones as shown in the diagram



Types of Joints

Types of Movable Joints		
Joint	Description	Example
 <p>Ligaments Ball and socket</p>	allows bones to move and rotate in nearly all directions	hips and shoulder
 <p>Hinge</p>	allows bones to move back and forth in a single direction	fingers, elbows, knees
 <p>Pivot</p>	allows bones to rotate	neck, lower arm below the elbow

Types of Skeleton

1. **Endoskeleton** – skeleton found inside the body of humans, mammals, reptiles, amphibians, birds, and is used for protection, support, structure and production
2. **Exoskeleton** – skeleton found in insects and arthropods such as crabs, shrimps, snails which is used for covering and protection
3. **Hydrostatic skeleton** – fluid-filled cavity surrounded with muscles, the fluid pressure helps the muscles move such as in earthworms and sea anemones

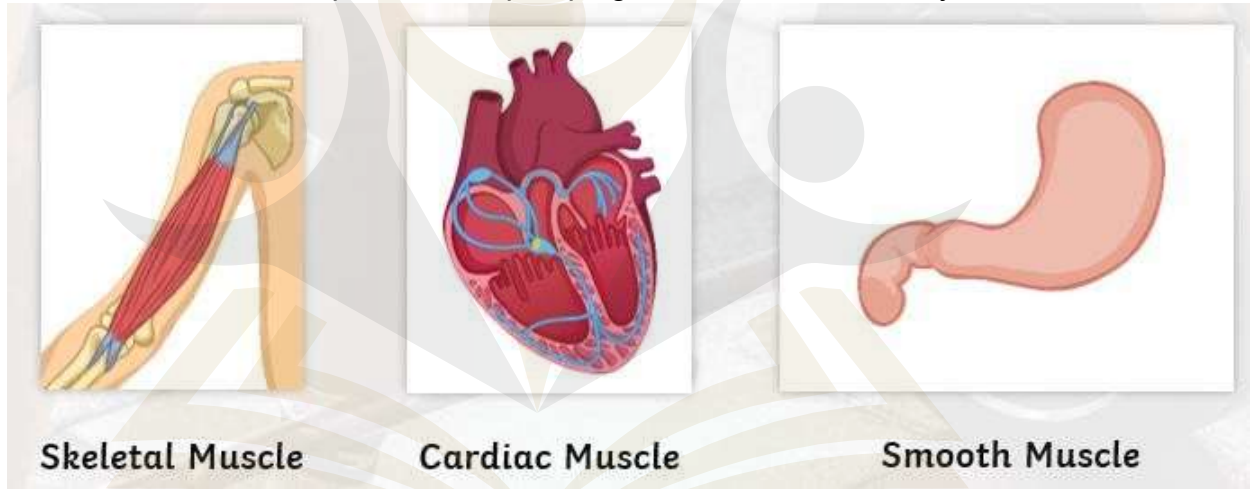


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Types of Muscles

1. **Skeletal Muscle** The only muscle type that we consciously control. Its job is to contract to move parts of the body. The other name is **voluntary muscle**.
2. **Smooth Muscle**. Found inside organs like the heart, small intestine, stomach and blood vessels. It is also called Involuntary muscle. Contracts to move substances through the organ.
3. **Cardiac Muscle**. Only found in the heart. It is also an Involuntary muscle because we cannot control. Responsible for pumping blood around the body



Skeletal Muscle

Cardiac Muscle

Smooth Muscle

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PLANT STRUCTURE AND SUPPORT

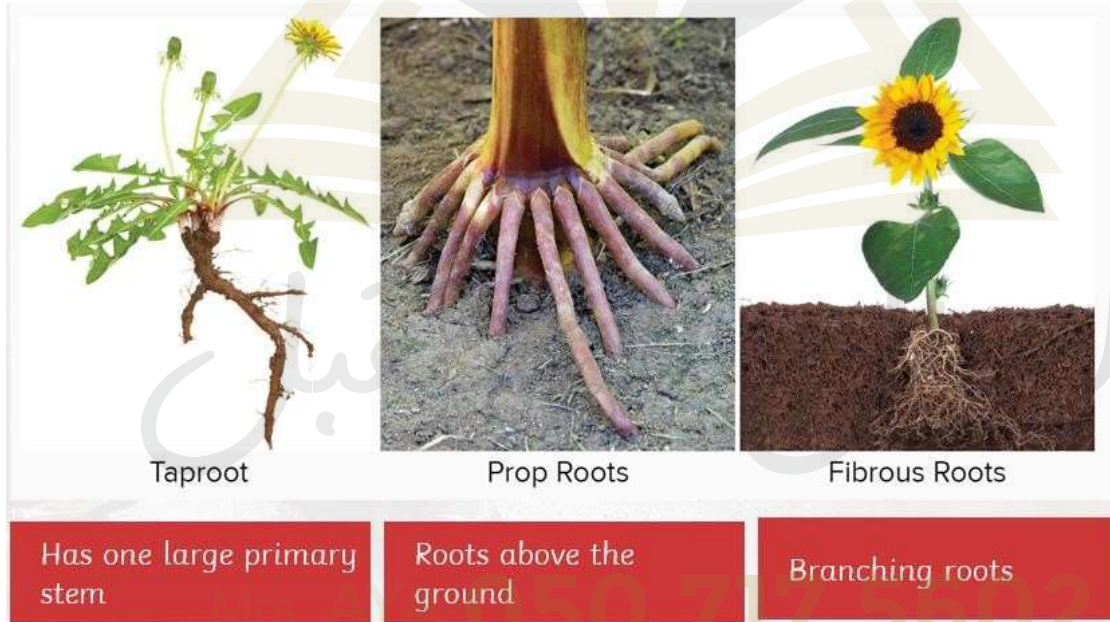
ROOTS AND STEMS

- Roots and stems are the major organs for support and structure

FUNCTIONS OF THE ROOTS

- Anchor the plant into soil or another plant
- Helps plant stay upright
- Absorb water and minerals from soil

TYPES OF ROOT SYSTEMS



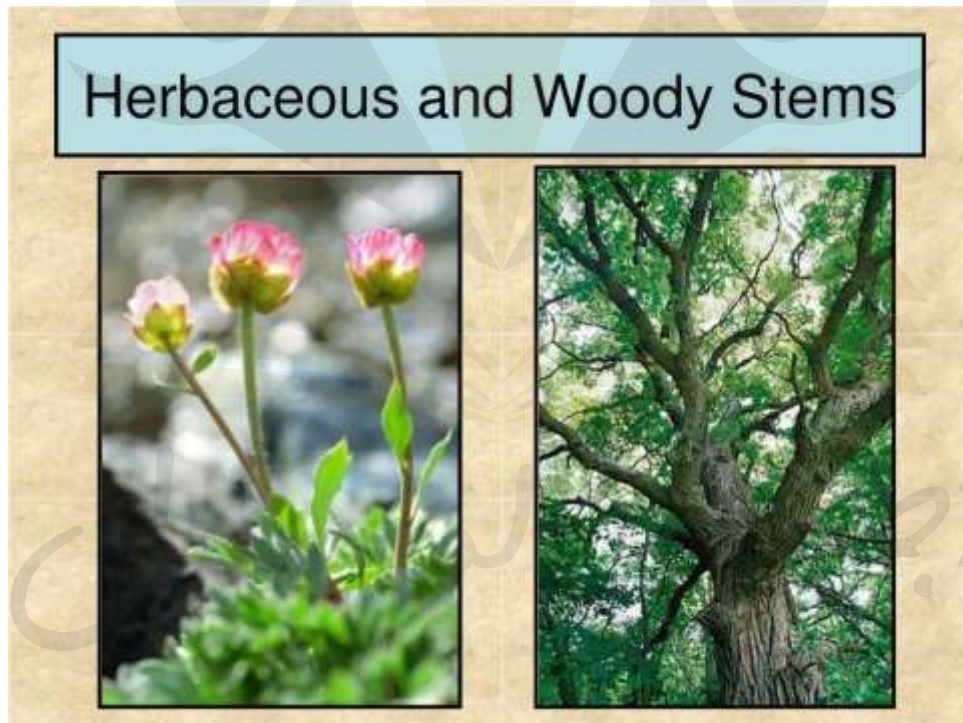
STEMS FUNCTIONS

- Helps transport water, minerals, and food around the plant
- Also for support and where the leaves are attached
- Contain the breathing organs called lenticels

TYPES OF STEMS

1. Herbaceous Stems – are green and normally soft stem found in vegetables and herbs

2. Woody Stem – they are rigid, non-green stems found in trees and shrubs



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