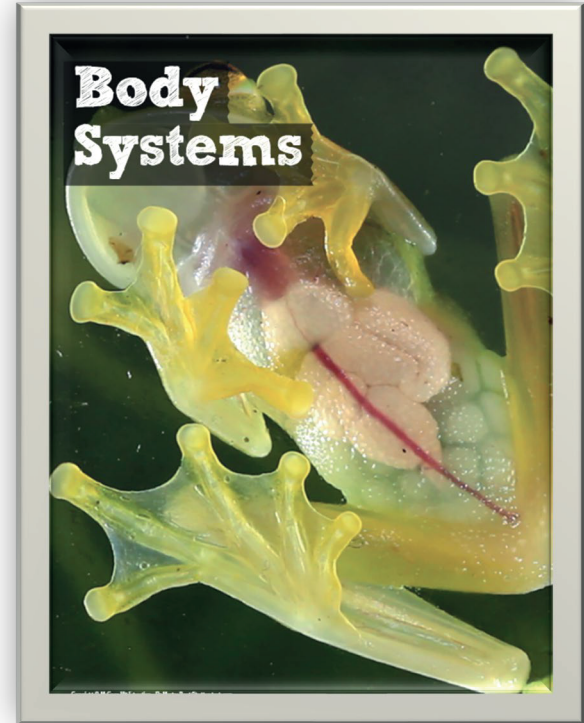


UNIT 2

LIFE: STRUCTURE & FUNCTION

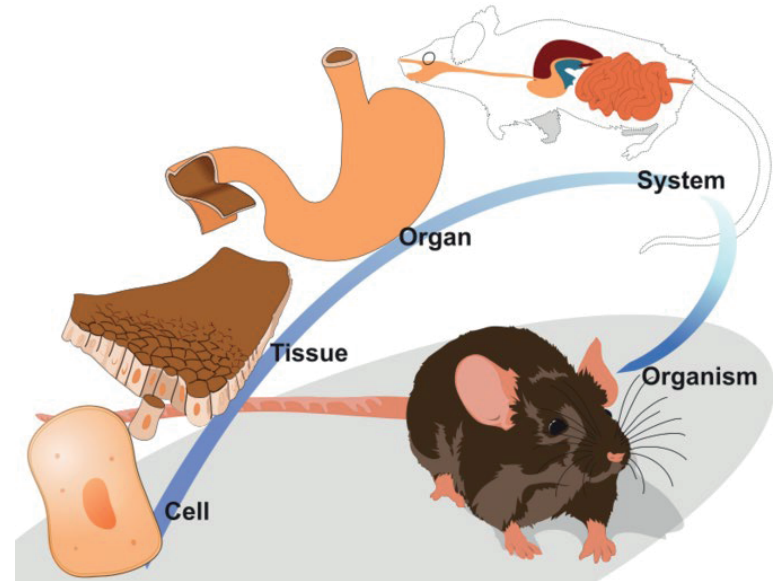
Module 2

Body Systems



Lesson 1

Levels of Organization



Learning Objectives

- Explore and model how the body is a system of interacting subsystems composed of groups of cells.
- Understand how cells are organized into tissues, organs, and organ systems to work together to carry out specific tasks in multicellular organisms.
- Engage in arguments to deepen their understanding of these concepts

ESSENTIAL QUESTION

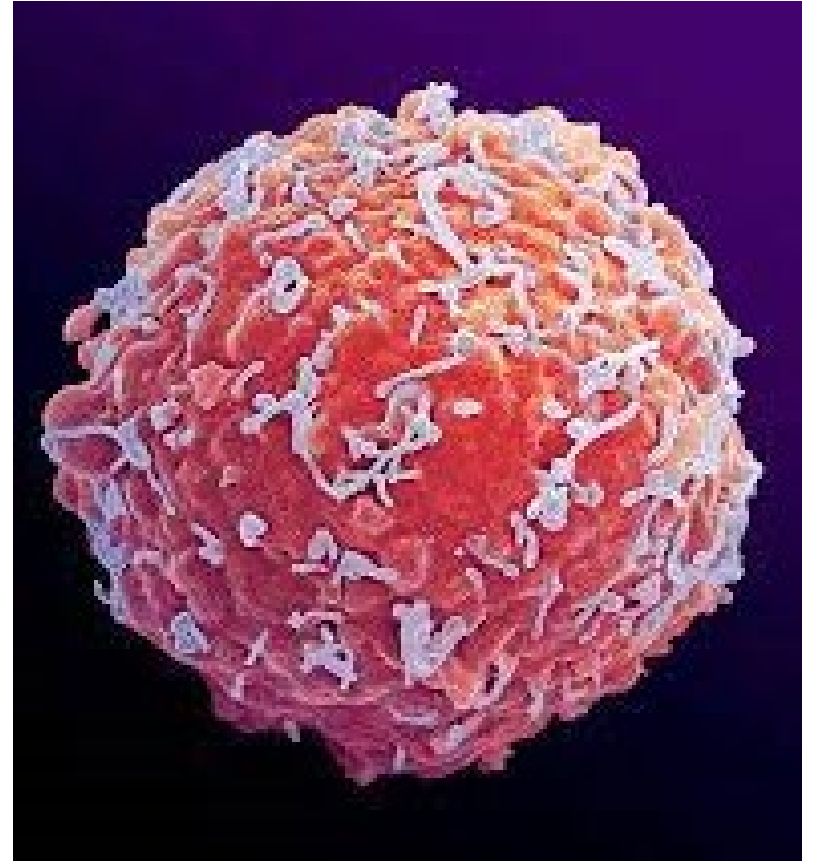
How does the organization of cells support life functions in multicellular organisms?



Lesson vocabulary

Cell

the smallest structural
and functional unit of an
organism.

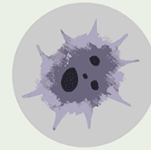


cell differentiation

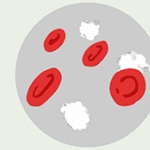
the process by which cells become different types of cells.



Stem Cells



Bone Cells



Blood Cells



Muscle Cells



Fat Cells



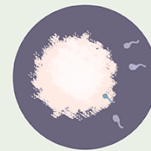
Skin Cells



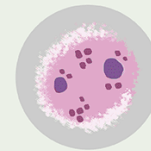
Nerve Cells



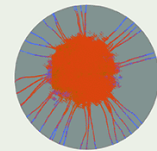
Endothelial Cells



Sex Cells



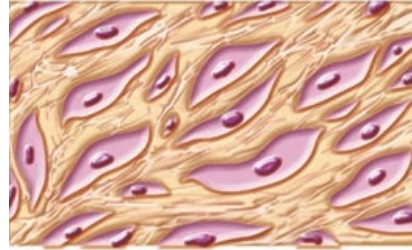
Pancreatic Cells



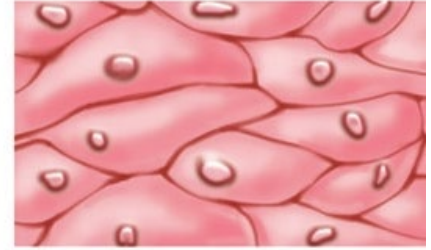
Cancer Cells

tissue

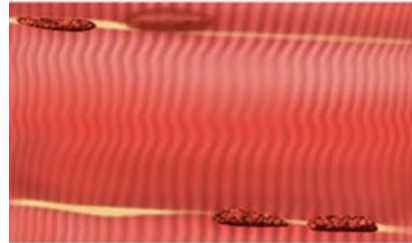
a group of similar types
of cells that work
together to carry out
specific tasks.



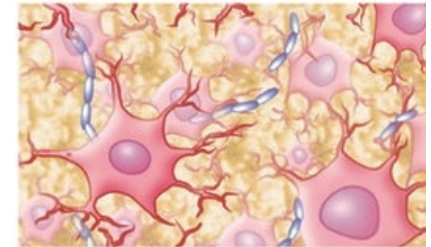
Connective tissue



Epithelial tissue



Muscle tissue

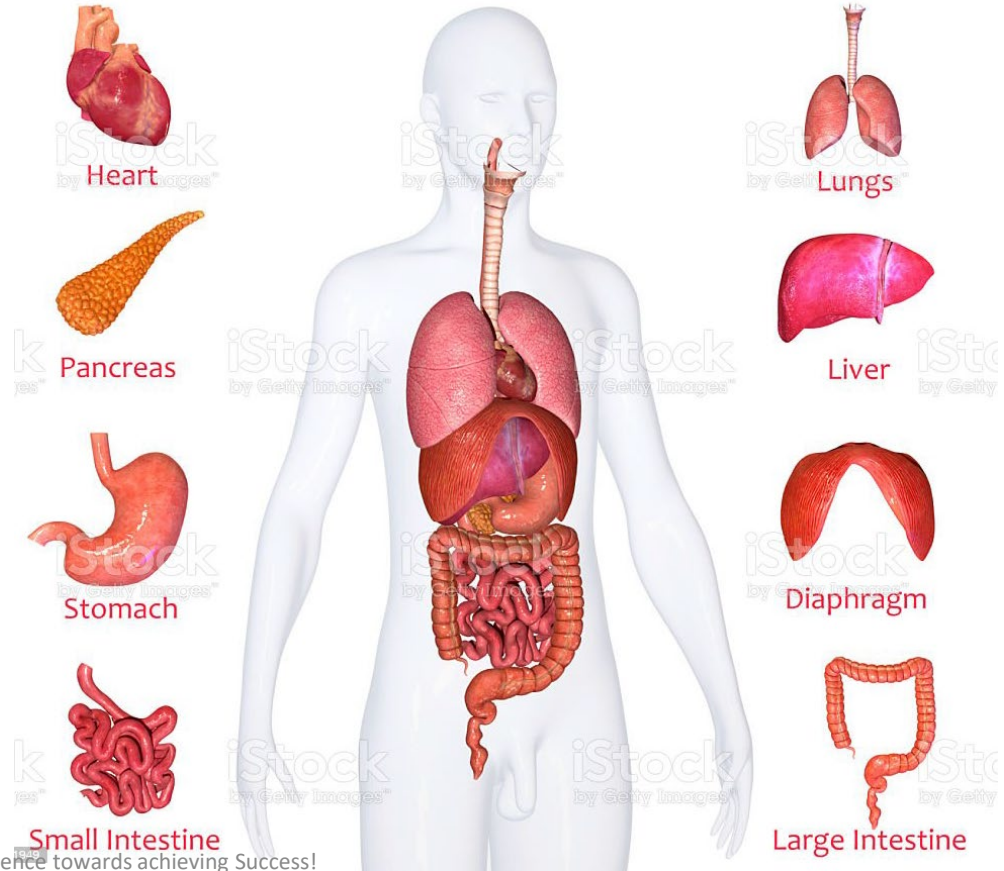


Nervous tissue

organ

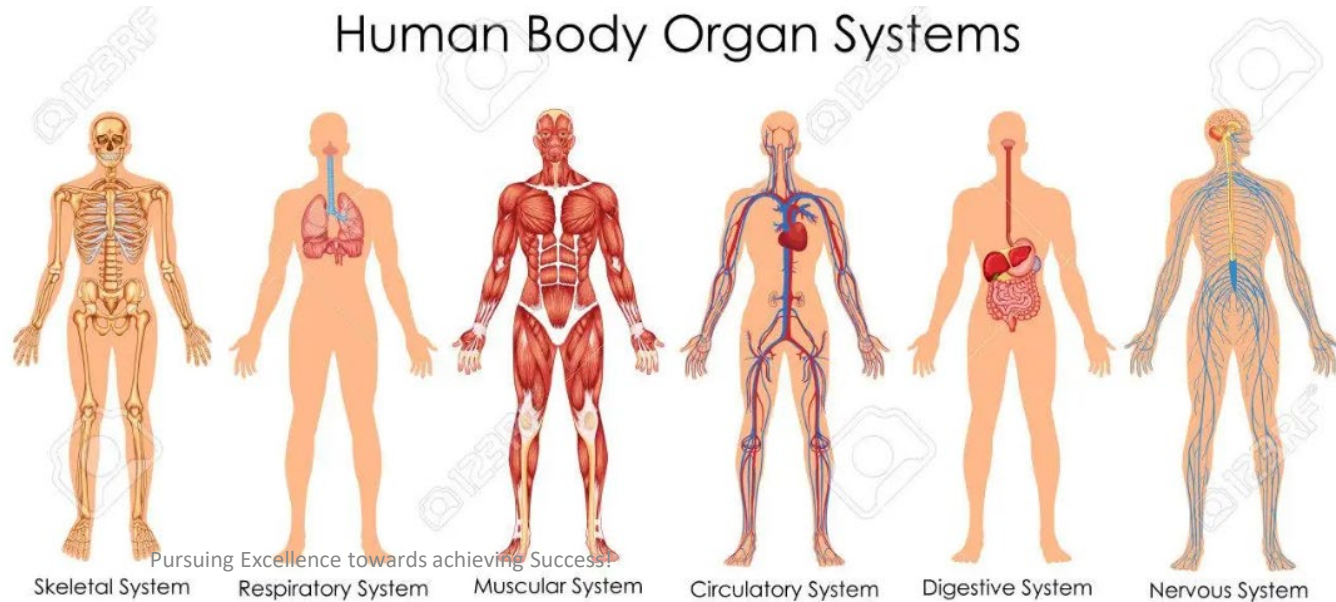
a group of different tissues
working together to
perform a particular job.

Internal Organs



organ system

a group of organs that work together and perform a specific task.



STARTER

Science Probe

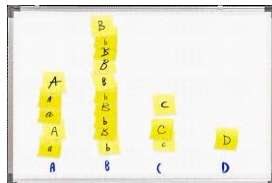
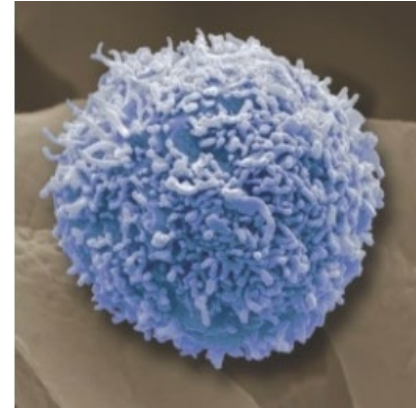
Four friends talked about the human body. They each agreed that the cell is the basic unit of structure in the human body. But they did not agree on the basic unit of function in the human body. This is what they said:

Sarah: I think body systems are the basic unit of function.

Todd: I think cells are the basic unit of function in the body.

Juanita: I think tissues are the basic unit of function.

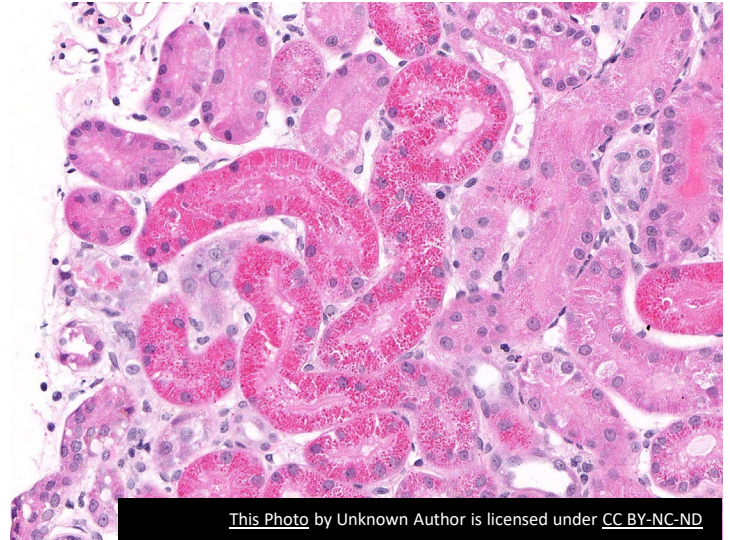
Seif: I think organs are the basic unit of function.



Write your option in the sticky note and paste it on the whiteboard under the respective option.

How are your cells organised to make up your body?

- Scientists estimate there are 37.2 trillion cells in our body.
- All of those are organized in a way that enables our body to function.
- **Cells** are smallest unit of living things that carries on the functions of life.



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Question time

1. The smallest unit of a living thing

☐ Cell

☐ Tissue

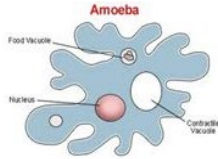
☐ organ

☐ Organ system

☐ Organism

2. All living organisms are composed of.....

Unicellular – organisms that are made of



Multicellular – organisms that are made of



How are cells
organized in the
body?

How are cells organised in the body?

- Organisms can be unicellular or multicellular.
- Multicellular organisms have different types of cells that perform specific jobs.
- In multicellular organisms, similar types of cells are organized into groups.

Question time

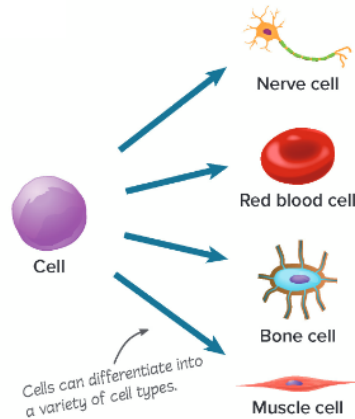
What does Unicellular mean?

- ☐ only one cell
- ☐ many cells
- ☐ 2 cell
- ☐ related to cell phones

What does Multicellular mean?

- ☐ only one cell
- ☐ many cells
- ☐ 2 cell
- ☐ related to cell phones

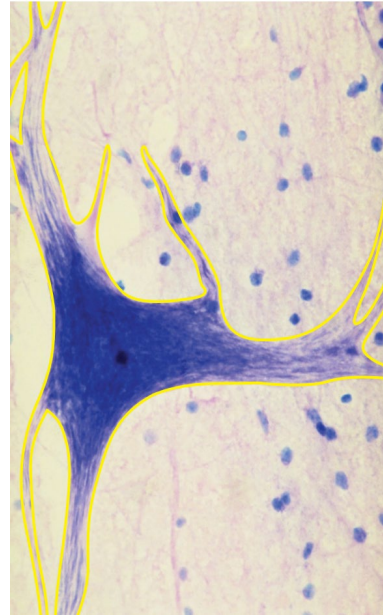
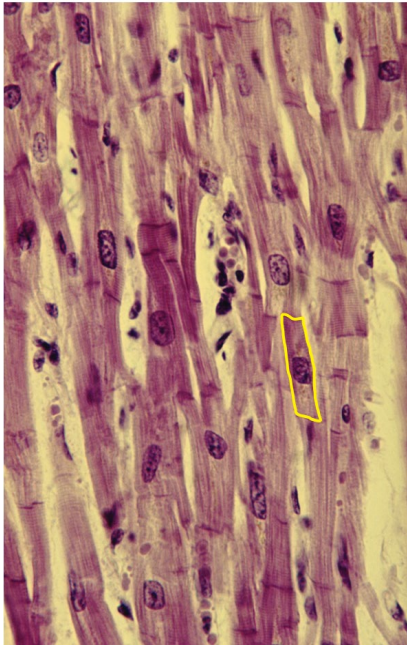
As multicellular organisms grow, cells divide to produce new cells. The first cells made can become any type of cell, such as a muscle cell, a nerve cell, or a blood cell, through the process of **cell differentiation**. As the number of cells in an organism increases, similar types of cells are organized into groups.



How are cells organised in the body?

When cells get together

1. Look at the cells provided by your teacher. What type of cell do you think each is? What do you think each cell does?



(Epithelial cell, nerve cell, muscle cell, blood cell)

How are cells organised in the body?

Tissues

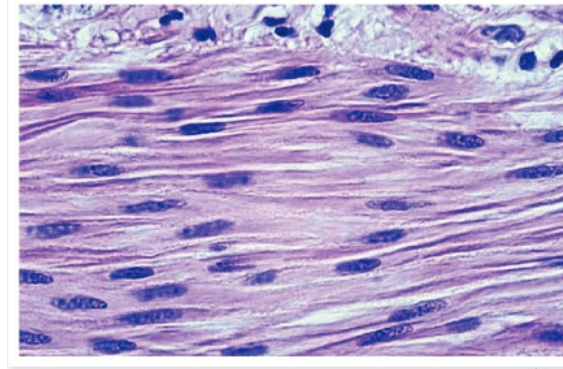
- Tissues are group of similar types of cells that work together to carry out specific tasks.



How are cells organised in the body?

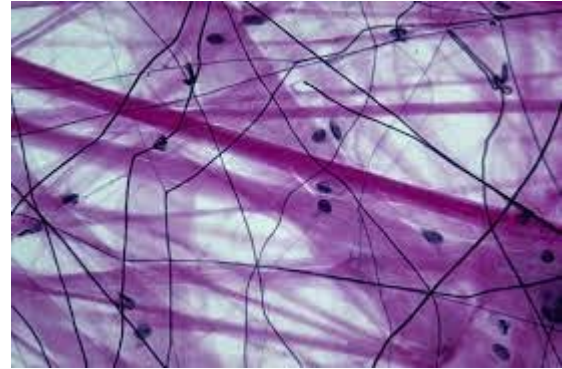
Types of Tissues

Muscle tissue



Cause movement

Connective tissue

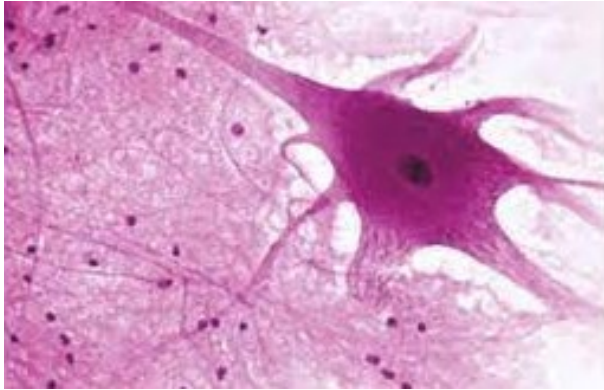


Provides structure and support and connects other types of tissues.

HOW ARE CELLS ORGANISED IN THE BODY?

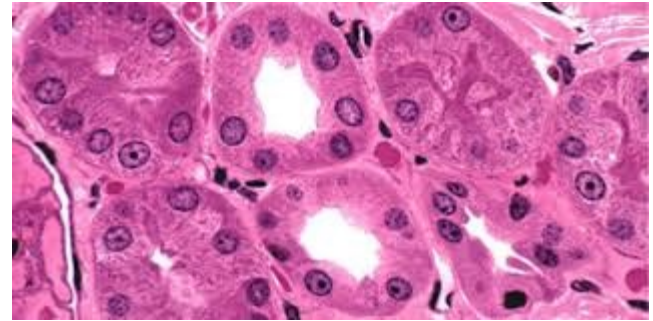
Types of Tissues

Nervous tissue



Carries messages to and from the brain.

Epithelial tissue



Forms the protective outer layer of the skin and the internal lining of the body.

How are cells organised in the body?

Types of Plant Tissues

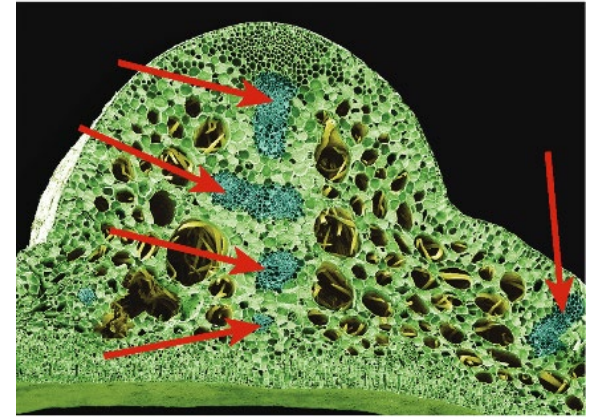
Dermal tissue

Provides protection and helps reduce water loss.

Ground tissue

Provides storage and support and is where photosynthesis takes place

Vascular tissue



Transport water and nutrients from one part of a plant to another.

How are tissues organised in the body?

Organs

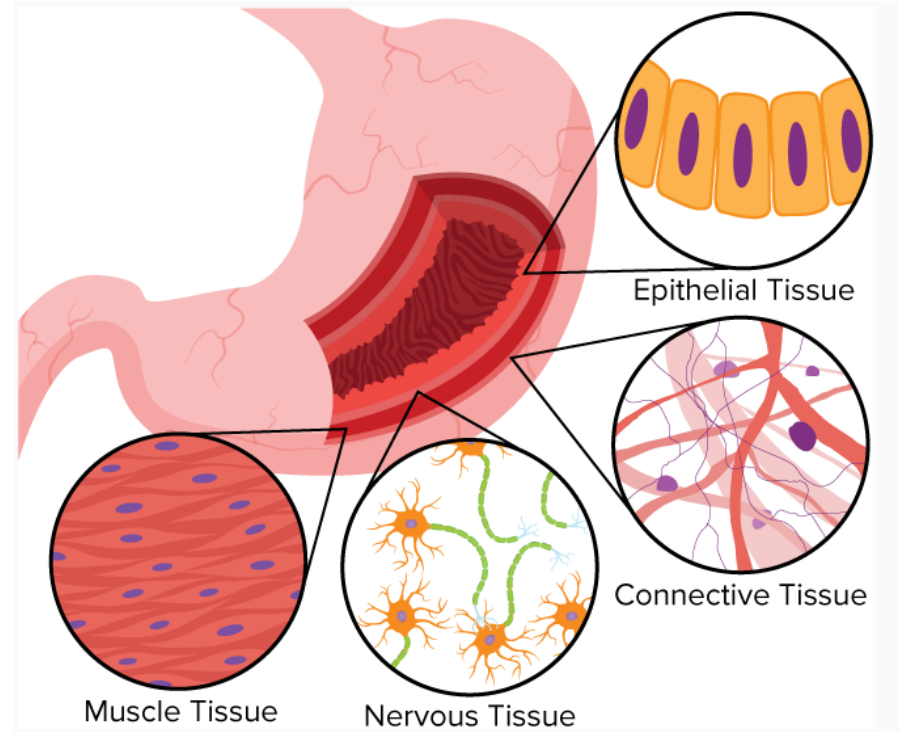
- Complex jobs in organism require more than one type of tissue.
- **Organs** are groups of different tissues working together to perform a particular job.
- For example, stomach is an organ specialized for breaking down food.
- It is made of all four types of tissues.
 - Muscle tissue
 - Connective tissue
 - Nervous tissue
 - Epithelial tissue

How are tissues organised in the body?

Organ - Stomach

Each type of tissue performs a specific function necessary for the stomach to work properly.

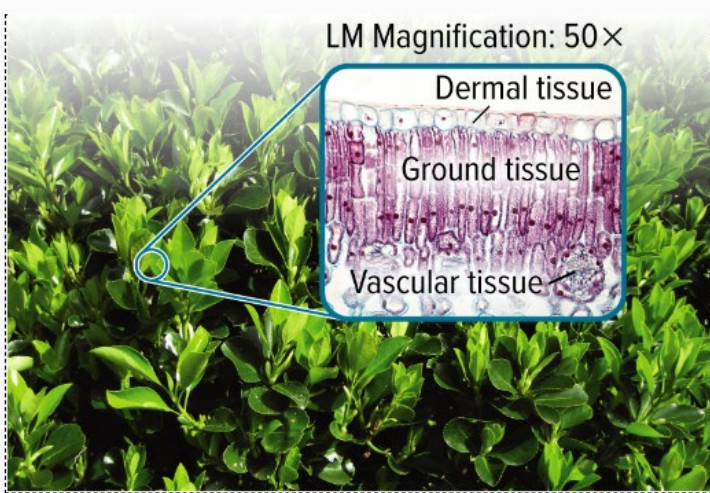
- Layers of muscle tissue contract and break up pieces of food.
Epithelial tissue lines the stomach.
Nervous tissue sends signal to indicate the stomach is full.
Connective tissue supports the stomach wall.



How are tissues organised in the body?

Organs – plant leaves

Plants also have organs. Leaves are organs specialized for photosynthesis. Each leaf is made of dermal, ground, and vascular tissues.



A plant leaf is an organ made of several different tissues.

- Dermal tissue covers the outer surface of a leaf.
 - Ground tissue is where photosynthesis takes place.
 - The vascular tissue moves both the food produced by photosynthesis and water throughout the leaf and the rest of the plant.
-
- The leaf is a vital organ because it contains ground tissue that produce food for the rest of the plant.
 - The ground tissue is tightly packed on the top half of a leaf.

How are organs organised in the body?

Organ system

Organ Systems Usually organs do not function alone. Instead, **organ systems** are groups of different organs that work together to complete a series of tasks. For example, the human digestive system is made of many organs including the stomach, the small intestine, the liver, and the large intestine. These organs and others all work together to break down food and take it into the body.

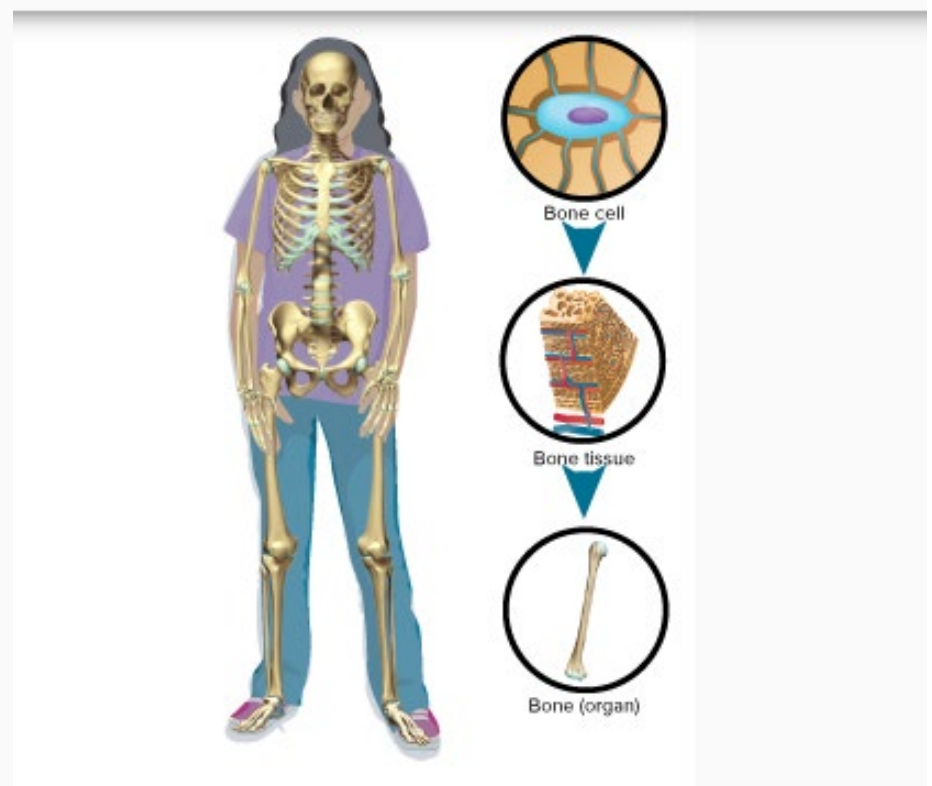
Plants have two major organ systems—the shoot system and the root system. The shoot system includes leaves, stems, and flowers. Food and water are transported throughout the plant by the shoot system. The root system anchors the plant and takes in water and nutrients.

How are organs organised in the body?

Organism

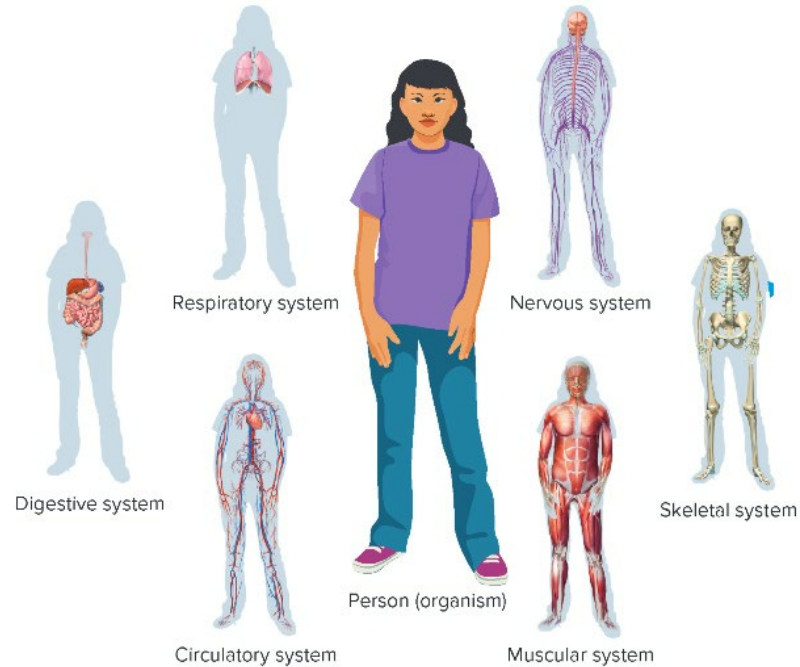
Organisms Multicellular organisms usually have many organ systems. These systems work together to carry out all the jobs needed for the survival of the organisms. For example, the cells in the leaves and the stems of a plant need water to live. They cannot absorb water directly. Water diffuses into the roots and is transported through the stem to the leaves by the shoot, or transport, system.

In the human body, there are many major organ systems. Each organ system depends on the others and cannot work alone. For example, the cells in the muscle tissue of the stomach cannot survive without oxygen. The stomach cannot get oxygen without working together with the respiratory and circulatory systems.



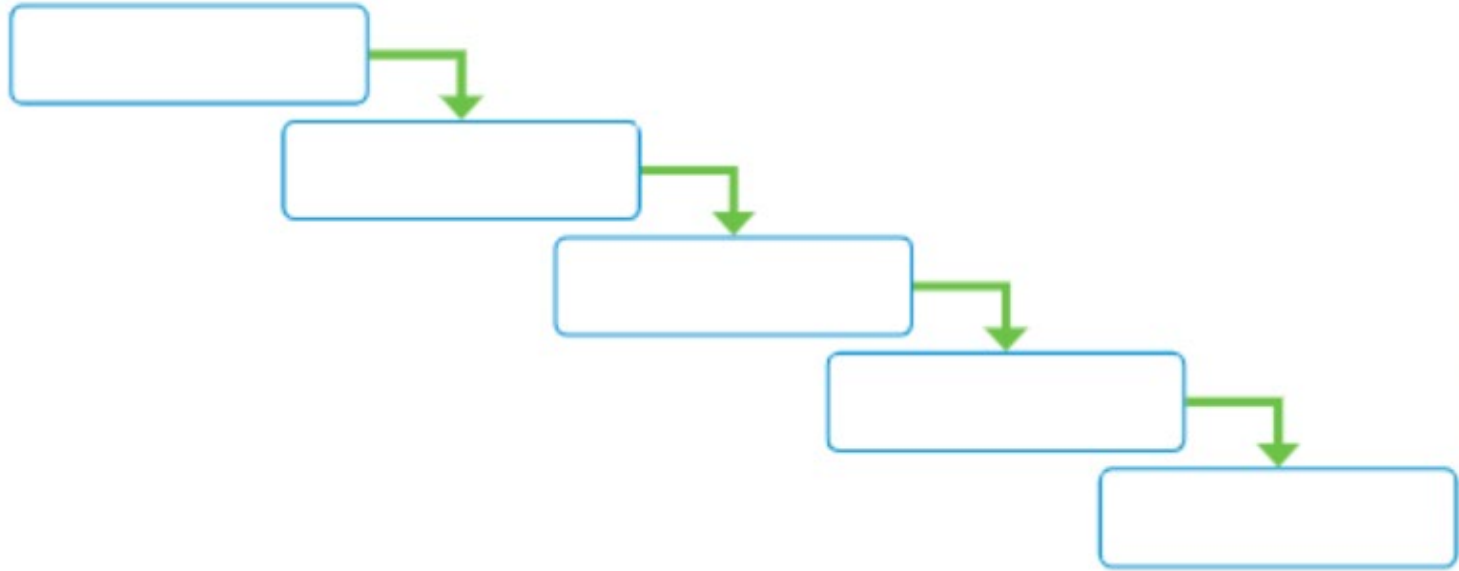
How are organs organised in the body?

Organism



Activity - 4

1. Fill in the path of organization from a cell to the organism.



2. How is this organization similar in plant bodies? How is it different?

Activity - 5

Group tasks – How do body function

INVESTIGATION

Body Functions

1. Think about all the different tasks bodies perform to stay alive. Brainstorm functions of the body below.

2. In your group, look at the diagram of the body. Think about the body function assigned to you by your teacher. What organs do you think need to work together to perform that function? How do you think those organs work together to perform that particular function?

Activity - 5

Group tasks – How do body function

Body Functions

Human Body Diagram (Muscular, Nervous, and Skeletal Systems)



Human Body Diagram (Circulatory, Digestive, Excretory, and Respiratory Systems)



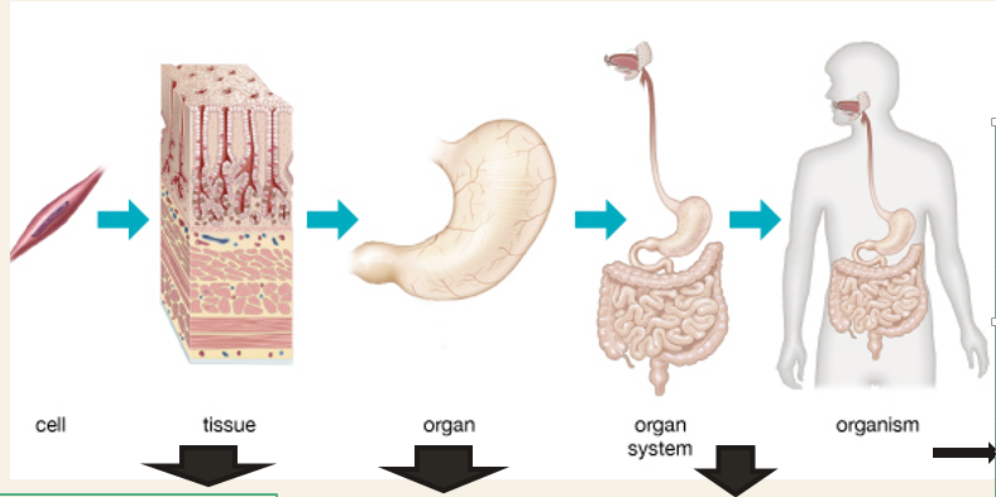
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LET US REVIEW

Multicellular Organism

Multicellular Organisms

Multicellular organisms have different levels of organization.



Organ systems work together and perform all the functions an **organism** needs to survive.

Group of cells that work together and perform a specific function are called **tissue**.

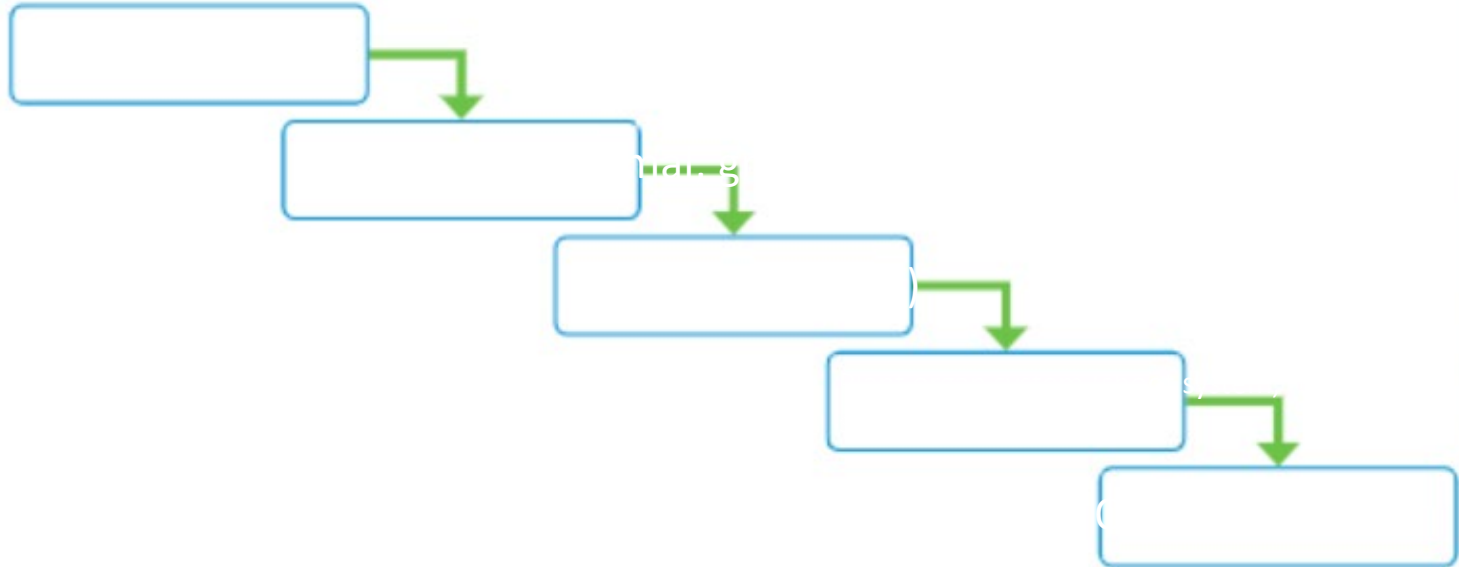
Tissues that work together and carry out a specific function are called **organ**.

Organs that work together and perform a specific function are called **organ systems**.

Lesson review

Summarize It!

1. Recognize levels of organization in plants. In the space below draw and label the levels of organization in a tree.



LESSON REVIEW

2. After further study, Cade realized his flowchart was incorrect. Which change should he make to correct the flowchart?

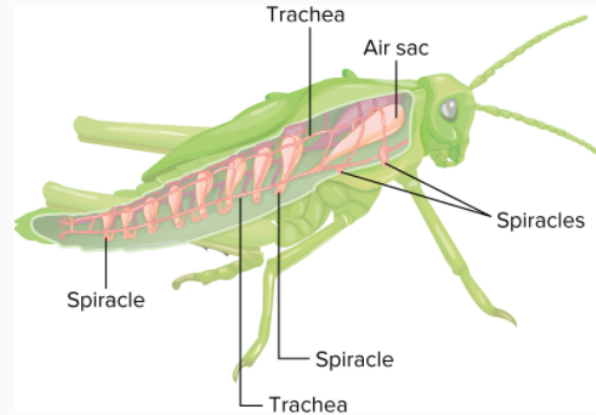
- ☐ A add the phrase *Cell Membranes*
- ☐ B move *Organ Systems* to the beginning
- ☐ C remove *Tissues* and *Cells*
- ☒ D switch *Organs* and *Cells*

LESSON REVIEW

The diagram shows the structures involved in respiration for a grasshopper.

3. These structures are an example of which level of organization within an organism?

- | | |
|----------------------------------|--|
| ☐ | A The structures make up an organelle. |
| ☒ | B The structures make up an organ system. |
| ☐ | C The structures make up a specialized cell. |
| ☐ | D The structures make up a tissue. |



Lesson review

Real-World Connection

4. Argue There are many different disorders and diseases that affect a person's blood cells. Some of these disorders and diseases require blood transfusions—taking blood from a healthy donor and inserting it into the veins of the person in need. Write an argument in support of donating blood to help people who suffer from these disorders, explaining how disorders and diseases of blood cells can affect larger systems in the body and the functioning of a person as a whole.

4. Answers may vary. Sample answer: If a person has an issue that affects their blood cells, many parts of their body can be affected. Cells make up tissues, tissues make up organs, organs make up organ systems, and organ systems work together to allow an organism to properly function. People with healthy blood can help people with blood cell disorders by donating blood. Sometimes putting a healthy person's blood into a person with a disorder or a disease can help that person's body function properly.

Practice

Three-dimensional thinking

Write an **argument** that **explains** which human tissue is most similar in **function** to dermal tissue in plants.

Answer:

Sample answer: Dermal tissue in plants is similar to epithelial tissue in humans because they both provide protection.

Question time

Which of the following is the correct order of organization in living things from most basic (simple) to most complex?

☐ a. Organism, cell, tissue, organ, organ system

☐ a. Cell, tissue, organ, organ system, organism

☐ a. Organ system, organ, tissue, cell, organism

☐ a. Cell, organ, tissue, organ, organism, organ system

What is the difference between a cell and a tissue?

☐ cell is basic unit of life; tissue is group of cells that work as one

☐ cell is basic unit of life; tissue is groups of different cells

☐ cell is group of tissues; tissue is basic unit of life

☐ cell is group of organs; tissue is group of different cells

A group of similar cells that perform the same function.

☐ tissue

☐ mass

☐ organelle

☐ tendon

Wordwall

<https://wordwall.net/play/5595/504/8398>

Live worksheet Registration

www.liveworksheets.com

Group: Grade 7

Group code: [Copy](#)

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