BODY ORGANIZATION

• The human body is organized by the different components that work together to perform all of the functions your body does.

• Going from the smallest to the largest, put these terms in order:
  _____ Organs
  _____ Tissues
  _____ Cells
  _____ Organ systems

1. The _____________ is the basic unit of structure and function in a living thing.
2. ________________ are a group of similar cells that perform the same function. There are four types:
   • _______________________ composed of muscle cells and can contract or shorten
   • _______________________ directs and controls electrical messages between the brain and body
   • _______________________ provides support for the body and connects all its parts (ex. Bone & fat)
   • _______________________ covers the surfaces, inside & out of your body for protection
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3. An ____________ is a structure that is composed of different kinds of tissue. An organ performs a specific job. (ex. Heart, lungs, brain, stomach, skin etc...)

4. An __________________ is a group of organs that work together to perform a major function. For example your esophagus, stomach, intestines, and colon are parts of the Digestive System.
ORGAN SYSTEMS
On your white boards write down what organ system matches each number

1. Circulatory - 1
2. Digestive - 2
3. Nervous - 3
4. Respiratory - 4
5. Endocrine - 5
6. Muscular - 6
7. Excretory - 7
8. Skeletal - 8
ORGAN SYSTEMS

**Digestive** - Breaks down food and absorbs nutrients

**Nervous** - Detects information from the environment and controls body functions.

**Skeletal** - Supports and protects the body.

**Respiratory** - Takes in oxygen and eliminates carbon dioxide.

**Muscular** - Enables movement of the body and internal organs.

**Endocrine** - Controls many body processes by means of chemicals.

**Excretory** - Removes wastes.

**Circulatory** - Transports materials to and from cells.

[Brain pop bodysystems](#)
HOMEOSTASIS

• All of the body systems work together to maintain homeostasis which is the body’s tendency to keep an internal balance.

• Homeostasis is the process by which an organism's internal environment is kept stable in spite of changes in the external environment.

• What examples of homeostasis can you think of that your body does?

<table>
<thead>
<tr>
<th>Hot</th>
<th>Cold</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vasodilation</strong></td>
<td>Arterioles dilate (enlarge) so more blood enters skin capillaries and heat is lost.</td>
</tr>
<tr>
<td><strong>Sweating</strong></td>
<td>Arterioles get smaller to reduce blood going to skin: keeping core warm.</td>
</tr>
<tr>
<td><strong>Pilo-relaxation</strong></td>
<td>Rapid contraction and relaxing of skeletal muscles. Heat produced by respiration.</td>
</tr>
<tr>
<td><strong>Stretching Out</strong></td>
<td>Hairs on skin stand up.</td>
</tr>
<tr>
<td><strong>Curling Up</strong></td>
<td>Making yourself smaller so smaller surface area.</td>
</tr>
</tbody>
</table>
THE SKELETAL SYSTEM

• What is the purpose of the skeletal system?
  1. To provide shape and support
  2. Allow you to move
  3. Protects your organs
  4. Produces blood cells
  5. Stores minerals and other materials for when your body needs them

• A newborn has about 275 bones while an adult has 206 bones
• Where do these bones go?
• As we grow some of the bones in our bodies fuse together like our skull
MAJOR BONES

- Cranium
- Clavicle
- Ribs
- Scapula
- Humerus
- Vertebrae
- Radius
- Ulna
- Metacarpals
- Femur
- Pelvis
- Carpals
- Phalanges
- Patella
- Tibia
- Fibula
- Tarsals
- Metatarsals

Starts At Eight
JOINTS OF THE SKELETON

- Joints allow bones to move in different ways. There are immovable and movable joints.
- Immovable joints - connect bones in a way that allows little to no movement.
- Moveable joints are held together by connective tissues called ligaments and cartilage. Cartilage covers the ends of bones and keep them from rubbing against each other.

- Types of Moveable joints
  1. Hinge - forward and backward motion
  2. Ball-and-Socket - greatest range of motion, can swing freely
  3. Pivot - allows for one bone to rotate around another
  4. Gliding - one bone to slide over another
INSIDE THE BONES

- Beneath the bones outer membrane is a layer of compact bone which is hard and dense but not solid. Blood vessels and nerves are contained in the compact bone.

- **Spongy bone** has many small spaces within it which makes it strong but lightweight.

- **Bone marrow** is soft connective tissue inside the bone. Red bone marrow produces most of the body’s blood cells. Other bones contain yellow marrow which stores fat that acts as an energy source.
BONE INJURIES

1. Fracture- a break in the bone. Simple fractures the bone may be cracked or completely broken into two or more pieces. Complex fractures is when the bone sticks out through the skin.

2. Dislocation- When the end of a bone comes out of its joint.

3. Sprain- when ligaments are stretched too far and tear in places. Ankle sprains are most common. Swelling may occur.

4. Osteoporosis- Mineral loss in the bones as people age which makes the bones weak and easily broken. More common in women than in men. A calcium rich diet can help avoid mineral loss.
THE MUSCULAR SYSTEM

There are about 600 muscles in your body. Muscles are divided into those that are involuntary and those that are voluntary.

- **Involuntary muscles** are ones that we are not in conscious control of. Some examples are the involuntary muscles that control breathing and digesting food.

- **Voluntary muscles** are ones that we are in conscious control of. For instance smiling and standing up use voluntary muscles.
THE MUSCULAR SYSTEM

Your body has three types of muscle tissue.

1. **Skeletal Muscle** - attached to the bones of your skeleton and provides the force that moves your bones. It looks banded or striated.

2. **Smooth Muscle** - these are involuntary muscles and work automatically. They react more slowly to control the movements of internal organs and blood vessels.

3. **Cardiac Muscle** – Found only in your heart. It is also involuntary like smooth muscle but is striated like skeletal muscle. It does not get tired like skeletal muscle.

- Muscle cells contract when they receive messages from the nervous system. Skeletal muscles must work in pairs. While one muscle contracts, the other muscle in the pair relaxes to its original length.
What is the largest organ in the human body? **THE SKIN!**

- If your skin was stretched out flat it would cover an area larger than 1.5 m^2 which is about the size of a twin mattress.

### Functions of the skin

- Covers and protects the body from injury, infection and water loss
- Regulates body temperature (blood vessels enlarge when hot and get smaller when cold. Also through sweating)
- Eliminates wastes (through sweating)
- Gathers information about the environment (nerves detect pain, pressure, and temperature).
- Produce vitamin D (when absorbing sunlight, required for Calcium absorption).
THE EPIDERMIS

• The first layer of skin is called the epidermis and is the outermost layer.
• There are no nerves or blood vessels in this layer.
• Many of the cells on the epidermis are dead and every time you rub your hands together, you lose thousands of dead skin cells and any bacteria on them.
• Some cells in the epidermis produce melanin, the pigment or colored substance that give skin its color. Melanin protects the skin from burning.
THE DERMIS

- The dermis is the inner and second layer of the skin. It is below the epidermis but above a layer of fat.
- The dermis contains nerves and blood vessels, sweat glands, hairs, and oil glands.
- Sweat glands produce perspiration, which reaches the skin's surface through openings called pores. Strands of hair grow within the dermis in structures called follicles.