# THE SKELETAL SYSTEM

#### INTRODUCTION TO THE SKELETAL SYSTEM

- I can locate and name the bones in the body.
- I can explain the purpose of the skeletal system.
- I can identify the different organs that make up the skeletal system.

- How many bones are in our skeletons?
- Why are bones different shapes?

#### THE HUMAN SKELETON

The adult human has 206 bones.
The human skeleton is internal, so it is also called an endoskeleton.
Variation in the size and shape of bones reflects the job they do.

- What is the purpose of the skeleton?
- What provides structure for cells?
- What provides structure for the human body?

#### SUPPORT

In order to maintain shape and form, living things need a support system. In cells, the support is provided by the cell membrane and cytoskeleton.

#### SUPPORT

 In humans as a whole organism, support is provided by the skeleton.

• The skeleton system is made of a special connective tissue called bone.

#### COMPONENTS

 In addition to bone, the skeleton system is also made of cartilage, tendons, and ligaments.

#### PURPOSE

- The skeletal system has four main purposes:
  - Provides a framework to support the body.
  - Protects some internal organs.

#### PURPOSE

 Contains and protects red bone marrow (site of blood cell production).

 Provides a storage site for inorganic salts like calcium.

#### PURPOSE

- The skeleton supports the weight of the body.
- It also provides a site for the attachment of muscles.
- Muscles and bones work together to allow the body to move.

#### **AXIAL SKELETON**

The human skeleton is divided into two parts: axial and appendicular.
What do you think is the axial skeleton?

#### AXIAL AND APPENDICULAR

- The axial skeleton contains the skull, vertebral column, and ribs.
- The appendicular skeleton contains the bones of arms and legs, shoulder, and pelvic girdle.

# **REVIEW QUESTIONS**

- Why are bones different shapes and sizes?
- Name two purposes of bone.
- What do you find in the axial skeleton?
- What do you find in the appendicular skeleton?
- Identify what provides structure and support for the cell.
- Identify what provides structure and support for the human body as a whole.

# CLASSIFICATION OF BONES

- I can identify the four types of bone shapes.
- I can classify the bones based on shape.

 Bones can be classified as one of four types, based on their shape.

• The four types of bones are: long, short, flat, and irregular.

# • Where do you expect to find long bones?

- Long bones are the bones of the arms, legs, hands, and feet.
- •Long bones do not include the bones of the ankle or wrist.

- The long part of a long bone, or the shaft, is called the diaphysis.
- The ends of a long bone are called the epiphysis.

- The diaphysis is made of compact bone.
- The diaphysis is hollow, which creates a canal in the long bone.
- The canal contains: yellow bone marrow, blood vessels, and fat.

•The epiphyses are made of spongy bone.

• They are covered by a thin layer of compact bone.

# DRAW A LONG BONE



#### SHORT BONES

• Short bones are the bones of the wrist and ankle.

#### FLAT BONES

 Flat bones include: ribs, scapula, patella, pelvic girdle, cranial bones.

• Where do you expect to find irregular bones?

#### **IRREGULAR BONES**

 Irregular bones include: vertebrae and facial bones. Short, flat, and irregular bones are all made of spongy bone covered with a thin layer of compact bone.

### **REVIEW QUESTIONS**

- What are the four shapes of bones?
- Where do you find long bones?
- What do you find inside long bones?
- Where do you find short bones?
- Where do you fine flat bones?
- Where do you find irregular bones?

# THE CRANIUM AND VERTEBRAL COLUMN

 I can explain the functions of the cranium, facial bones, sinuses, and vertebral column.

- What is the purpose of the cranium?
- What is the purpose of the spinal column?

#### CRANIUM AND FACIAL BONES

- The cranium encloses and protects the brain.
- The facial bones function to:
  - Form the framework for the face.

Contain cavities for the special sense organs.

#### FACIAL BONES

Provide openings for passage of food and air.
Anchor muscles used for facial expression.

#### THE SKULL

- Most of the adult skull bones are firmly joined together by sutures.
- In infants, the sutures are not there, which is why babies have soft spots.
- The skull is full of empty cavities that form the sinuses.

- Why would babies need a soft spot? What is the purpose?
- Predict what you think the sinuses do for the skull.

- The sinuses, in general, lighten the skull because they are filled with air.
- The nasal sinuses warm and humidify inhaled air because they are lined with mucus.
- The curves of the skull bones increase their strength but also keep them lightweight.

• What type of bones, long, flat, short, or irregular make up the vertebral column?

- The vertebral column is also called the spine.
- It is made of 26 irregular bones.
- The bones are connected in a way that creates a flexible/curved structure.

- The spine surrounds and protects the spinal cord.
- The vertebrae also provide a site of attachment for ribs.

• The first seven vertebrae in the neck are called cervical vertebrae.

- The next twelve vertebrae are the thoracic vertebrae.
- The five vertebrae of the lower back are the lumbar vertebrae.
- Below the lumbar vertebrae is the sacrum, that works with the hip bones.

• Why do the bones get bigger as you move down the spine?

- The sacrum is actually several vertebrae fused together.
- The end of the vertebral column is the coccyx, or tail bone.
- Vertebrae increase in size as you move down because they support more and more weight.

- What letter does the spine resemble?
- Why would the spine be shaped like this?

- The spine is curved like an S to increase its flexibility and resilience.
- Each vertebrae contains an intervertebral disc.
- The discs are a cushion like pad.

• The discs are elastic and compressible.

They act as shock absorbers when we walk, run, or jump.
The discs also help join the vertebrae together.

• A herniated disc or slipped disc results when a disc ruptures and pushes on the spinal cord.

# • What is the purpose of the ribs?

#### RIBS

• There are 12 pairs of ribs. •The upper 7 pairs attach to the sternum by cartilage. They are called true ribs because they attach directly to the sternum.

#### RIBS

- The remaining five pairs are false ribs because they do not attach directly.
- Rib pairs 11 and 12 are free ribs because they do not attach to the sternum at all.

#### RIBS

The job of the ribs is to protect internal organs and support the weight of the torso.
The clavicle acts as a brace, holding the arms and scapula

away from the body.

# **REVIEW QUESTIONS**

- List two jobs of the facial bones.
- What is the purpose of the sinuses?
- Why do babies have a soft spot?
- List the regions of the spine from top to bottom.
- Why is the spine shaped like an S?
- Why do the bones in the spine get bigger as you move down the spine?
- Why is a herniated disc so painful?
- What is the purpose of the ribs?
- What is the difference between true ribs and false ribs?