



The Leg Bone is Connected to the.... (A look at the skeletal system)

Justin Wyllie

Grade Level: 9-10

Time Allotment: Two 45-minute class periods

Overview: There are over 200 bones in the adult human body which all provide many functions for us. Students will learn how major bones of the body are developed and assembled to provide protection and support for us.

Subject Matter: Health

Learning Objectives:

Students will be able to:

- Identify major bones based on their scientific names
- Identify and name the 4 types of joints
- Explain what bone groups make up the appendicular and axial skeletons
- Name the 3 layers of and 4 different shapes of bones
- Construct an animated skeleton out of a pile of bones

Standards:

From the Montana State Standards for Health Enhancement:
(Available on-line at www.opi.state.mt.us)

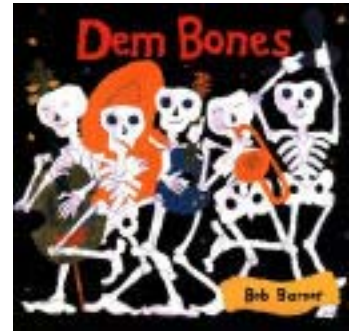
Standard 1: Have a basic knowledge and understanding of concepts that promote comprehensive health.

Standard 5: Demonstrate the ability to use critical thinking and decision making to enhance health.

Standard 6: Demonstrate interpersonal communication skills to enhance health.

Media Components:

VIDEO



Human Body in Action: Skeletal and Muscular Systems. Schlessinger Science Library. Wynnewood, PA, 2001.

WEB SITES

The Human Skeleton. Kidport Reference Library.

<http://www.kidport.com/Reflib/Science/Humanbody/BodyBones.htm>

This site has great information about major bones of the body and what they do for us. It also allows students to see the common names, as well as, the more scientific names of the bones. You will need to add Macromedia Flash and/or Shockwave to your computers for interactive education. You can do this free at the sites home <http://www.kidport.com/default.htm>.

Mr. Bones. Lawrence Hall of Science Home.

<http://sv.berkeley.edu/showcase/>

This interactive site allows students to see what a completed skeleton looks like before assembling their own. The site helps students to identify the bone by its name, as well as, where it belongs in the skeleton.

Materials:

For each student:

My Bones Ache sheet (see attached)

Human Body in Action sheet (see attached)

The Human Skeleton (see attached)

For every 2 students:

1-6ft. piece of white bulletin board paper

5-6 colored pencils or markers

1-4ft. measuring stick

1-Glencoe Health Text "A Guide to Wellness"

Prep for Teachers:

- Prior to teaching this lesson, bookmark the site used in the lesson on each computer in the computer lab.
- Prep the video so that it is at the desired location for the video portion of the lesson.
- Prepare the hands-on elements of the lesson by:
 - Copying all three of the worksheets attached to this lesson
 - Gather all art material needed for the culminating activity
 - Make your own or use a previously made example of the skeleton in the culminating activity.

When using media provide students with a FOCUS FOR MEDIA INTERACTION, a specific task to complete and/or information to identify during or after viewing of video segments, Web sites, or other multimedia elements.

Introductory Activity:

Step 1: Distribute *My Bones Ache* sheet to each student. Tell students to read along with you as you read the story out loud.

Step 2: Ask the students to remain silent while they go back through the story, think of a more common name for each underlined bone(s) used in the story, and write it down on their worksheet.

Step 3: Have students reread their stories out loud in class. If a wrong answer is given by a reader, take time to ask others to help out. Students should keep this worksheet for future reference. (*See attached answer sheet.*)

Step 4: Have students brainstorm about other common bones and their names, make a list of these on the board. (*Thigh bone; Femur Lower arm; Radius and Ulna Upper arm; Humerous Breast bone; Sternum Shoulder blade; Scapula Hips; Illium*)

Learning Activity:

Step 1: Ask students a few questions concerning bones prior to viewing the video. (What are the 4 types of bone joints found in the body? What bones are included in the axial skeleton? The appendicular skeleton?, etc.) (*Answers will vary.*)

Step 2: Insert the video, *Human Body in Action: Skeletal and Muscular Systems* into your VCR. Provide your students with a FOCUS FOR MEDIA INTERACTION; hand to each student the *Human Body in Action* worksheet and ask them to fill it out as the video answers each question. START the tape to the picture of a girl gymnast doing a backhand spring and the narrator says, "The skeleton is divided into two parts." PAUSE the tape when the narrator says, "Your bones give you structure like the frame of a building." The video picture will be showing a human skeleton in front of the framework of a building.

Step 3: Provide your students with a FOCUS FOR MEDIA INTERACTION; after answering question 1, check for student comprehension by asking students to explain the difference between axial and appendicular skeletons. (*Axial skeleton includes the 80 bones of the skull, spine, ribs, and sternum. Appendicular skeleton includes the 126 bones of the shoulders, arms, hands, hips, legs, and feet.*)

Step 4: Provide your students with a FOCUS FOR MEDIA INTERACTION; ask students to complete question 2 as they watch this portion of the video. PLAY the tape from the point at which it was paused. PAUSE the tape when the narrator says, "The bones that make up your spine." The video picture will be showing a young boy touching the bones of the spinal column on a skeleton. FAST FORWARD to the video

picture of an old bearded man, the narrator will say, “Even an X-ray can not show you what is inside a bone.”

Step 5: Provide students with a FOCUS FOR MEDIA INTERACTION; ask students to complete question 3 while watching this portion of the video. PLAY the tape. PAUSE the tape when the narrator says, “Blood vessels carry oxygen and nutrients to the bone cells and haul the wastes away.” The video picture will be showing a diagram of a bone. FAST FORWARD to the video picture of some broccoli then a young girl performing some gymnastic moves. The narrator says, “Watching Tess move, you may think she has been soaking her bones in vinegar.” PAUSE the tape after the narrator makes the joke about the funny bone. The video picture will show a young boy doing homework in a classroom setting.

Step 6: Provide students with a FOCUS FOR MEDIA INTERACTION; have students quickly brainstorm out loud “What is the funny bone?” PLAY the tape. STOP the tape when the narrator says, “That is why it feels so funny or uncomfortable when you hit it.” The video picture will show the young boy rubbing his funny bone. Allow for student comments and questions on the video. *(Have students hand in worksheet.)*

Step 7: Have students individually log on to *The Human Skeleton* at <http://www.kidport.com/Reflib/Science/Humanbody/BodyBones.htm>. Provide your students with a FOCUS FOR MEDIA INTERACTION, asking them to complete the Human Skeleton worksheet as they read about the skeleton. *(Have students hand in worksheet.)*

Culminating Activity:

Step 1: Divide the students into groups of two. Provide for each group of students a 6 ft. long piece of bulletin board paper and a black marker.

Step 2: With the paper flat on the floor, ask one student to lie down on his or her back on the paper. The other group member should use the black marker to then trace the outline of the body. *(Remind students to stay far enough away from their partners to not mark on their clothing.)* Once the outline is complete, ask students to draw a line down the center of the outline. (A 4ft. measuring stick may come in handy here.)

Step 3: Tell them to choose one half of the body outline to fill in with the correctly labeled bones of the body. Students will be able to use their health texts to aide them in the completion of this.

The other half will be filled in with the muscles which will be learned in the next lesson.

Cross-Curricular Extensions:

BIOLOGY

Compare the bone structure of animals to the human skeleton.

HISTORY

Study how archeologists/paleontologists use bones to determine historical events.

PSYCHOLOGY/LAW

Discuss how bones are examined at a crime scene or after at a morgue.

ART

Study how bone structure relates to drawing the human figure.

Community Connections:

- Ask a doctor to visit the classroom to discuss bones or show how he reads the x-rays of bones.
- Ask a nutritionist to visit the classroom to discuss eating for healthy bones.
- Ask a sports therapist to visit the classroom to discuss therapy and care for broken bones.
- Ask a detective or coroner to visit the classroom to share how bones are examined in a crime scene.

MY BONES ACHE

I should have known it was going to be one of those days, when I had stepped out of bed and stubbed my (1)PHLANGE on the night stand. While hopping up and down on one (2)METATARSAL and grasping the other, I slipped and fell onto my right shoulder breaking my (3)CLAVICLE. As I crawled on my (4)METACARPALS and (5)PATELLAS to my bed, I felt my (6)CRANIUM begin to ache. I found my phone and let my (7)PHLANGES do the walking as I called my friend to come help me out. My friend answered the phone with a loud scream; my (8)MANDIBLE dropped, I asked what had happened, and he replied that he had been startled by the ringing phone, fell out of bed landed on his (9)COCCYX. Following that while racing to the phone he hit his (10)TIBIA on a stool. I should have known it was going to be one of those days.

MY BONES ACHE

ANSWER SHEET

I should have known it was going to be one of those days, when I had stepped out of bed and stubbed my (1)toe on the night stand. While hopping up and down on one (2)foot and grasping the other, I slipped and fell onto my right shoulder breaking my (3)collar bone. As I crawled on my (4)hands and (5)knees to my bed, I felt my (6)head begin to ache. I found my phone and let my (7)fingers do the walking as I called my friend to come help me out. My friend answered the phone with a loud scream; my (8)jaw dropped, I asked what had happened, and he replied that he had been startled by the ringing phone, fell out of bed and landed on his (9)tail bone. Following that while racing to the phone he hit his (10)shin on a stool. I should have known it was going to be one of those days.

Human Body in Action

1. How many bones make up our skeletal system at adulthood? _____
How many bones make up the axial skeleton? _____
How many bones make up the appendicular skeleton? _____

2. Name the 4 shapes of bones and give one example of each shape.

- | | | | |
|-----|-----|-----|-----|
| A. | B. | C. | D. |
| ex. | ex. | ex. | ex. |

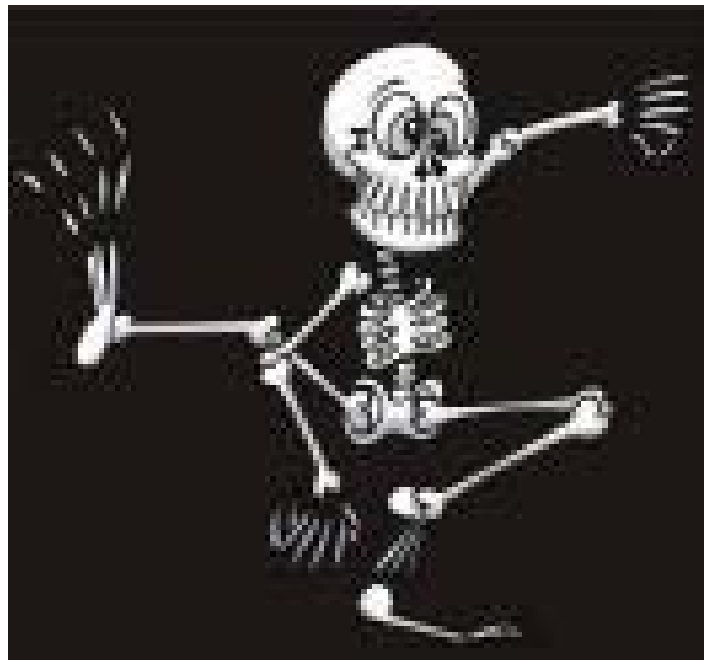
3. Name the three layers of skin.

- | | | |
|----|----|----|
| A. | B. | C. |
|----|----|----|

4. Name the 4 types of joints and give one example of each joint.

- | | | | |
|-----|-----|-----|-----|
| A. | B. | C. | D. |
| ex. | ex. | ex. | ex. |

What is the “Funny Bone?”



Human Body in Action

Answer sheet

2. How many bones make up our skeletal system as an adulthood? 206
How many bones make up the axial skeleton? 80
How many bones make up the appendicular skeleton? 126

2. Name the 4 shapes of bones and give one example of each shape.

- A. irregular B. long C. short D. flat
ex. (various) ex. (various) ex. (various) ex.(various)

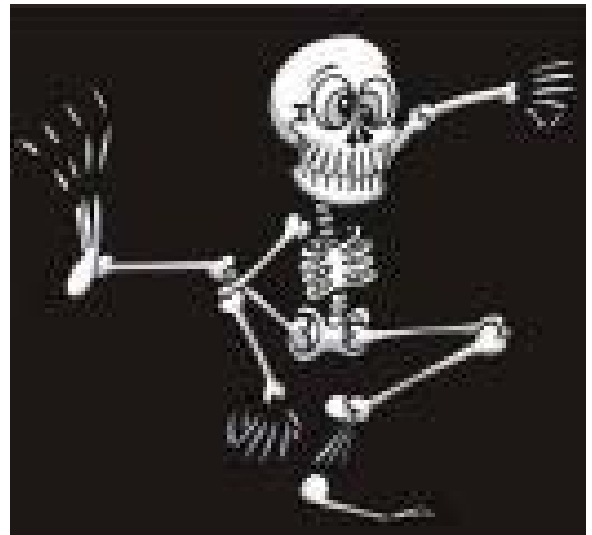
5. Name the three layers of skin.

- A. periosteum B. compact bone C. spongy bone

6. Name the 4 types of joints and give one example of each joint.

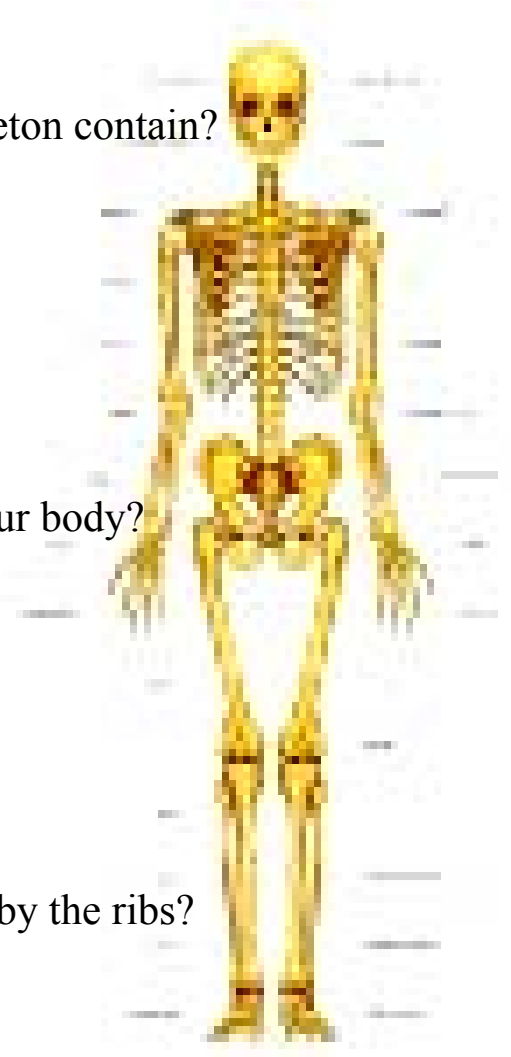
- A. ball & socket B. pivot C. immovable D. hinge
ex. (various) ex. (various) ex. (various) ex. (various)

What is the “Funny Bone?”
nerve endings in the elbow



The Human Skeleton

1. How many bones does the adult skeleton contain?
2. Which of the jaw bones move?
3. Which bone connects your arm to your body?
4. Is the tibia or the fibula larger?
5. What's the name of the cage formed by the ribs?
6. What keeps vertebrae from grinding against each other?
7. How many phalanges are in each finger?



The Human Skeleton

Answer Sheet

8. How many bones does the adult skeleton contain?
206
9. Which of the jaw bones move?
MANDIBLE or Lower Jaw Bone
10. Which bone connects your arm to your body?
SCAPULA or SHOULDER BLADE
11. Is the tibia or the fibula larger?
TIBIA
12. What's the name of the cage formed by the ribs?
THORATIC
13. What keeps vertebrate from grinding against each other?
CARTILAGE
14. How many phalanges are in each finger?
THREE

