

The Human Body, Lesson on Measurement and the Skeletal System

Student Objectives:

Students will identify bones in the human body, and understand the purpose of various bones' structures.
Students will use standard units to estimate and measure length.

Student's Finished Product:

Recreation of student's own skeletal system
Model of the remains they discovered
Artist's rendering of what newly discovered humanoid the student creates

Student materials:

Notebooks, pencils, pens, markers, crayons, large paper, paint, brushes, sponges, various sized paper/scraps, glue, paper mâché recipe, cardboard, and other various art materials.

Student resources:

rulers, measuring tape, yard sticks, project description sheet, human body's skeletal system diagrams, life size model of human skeleton, various photos of ancient remains previously discovered, articles on Lucy (the first bipedal hominid found), "Dem Bones" song/lyrics

Part 1: Recreating our Skeletal System

1. Class watches and sings along to "Dem Bones" video, and as they sing "the foot bone's connected to the ankle bone..." students point to or wiggle the part of their skeleton that we sing.

www.youtube.com/watch?v=cLi55MV04a8

2. Teacher passes out various diagrams of the human skeletal system. Students are given time to find the proper names of the bones in "Dem Bones" song.

3. Students sing their own lyrics to the song, but with proper names of bones (For example, "skull bone" instead of "head bone," or "femur" instead of "thigh bone."), as they point to the bones they name.

4. Teacher starts a dialogue with questions:

- How long do you think your femur bone is? humorous? phalanges?
- How do you know?
- Can we measure how long they are exactly?
- How could we estimate?

5. Students feel for the joints between bones, as they bend their arms/wrists or ankles/knees.

They use measuring tools to help estimate the length of the bones in their arms and legs, and record the names of bones and length in science journals. They continue to feel for the joints between bones, estimate their length, and record in Science journals.

6. Students are given several days to complete the following activity:

- Students sketch bones onto white paper to cut out.
- Students are given large bulletin paper, to trace their bodies on.
- Students glue or tape their bones to their own figure (traced onto large paper).
- Students label the bones on their completed skeleton.

Part 2: Archeology Project (this may overlap with recreating skeletons project):

Introduction:

1. Teacher questions students to start a dialogue:

- How many bones do you think we have in our feet? Our heads?
- Why are our legs longer than our arms?
- What is the purpose for our ribs? Our cranium? ... Our entire skeletal system?

2. Teacher presents project:

“Imagine you are an archeologist, and have discovered the skeletal remains of an ancient humanoid. It is an incredible find because it seems this animal lived for twice as long as humans do today. In order to present this find, you must gather data from the remains, analyze this data, and present your findings to the government. You may use drawings, models, photos, charts, graphs, recordings. Make sure you give as much detail about this new discovery so that your audience will be able to envision it clearly. Oh! And the data you collect is all in your head! It's up to you to create what you discovered.”

3. Students are given time to record ideas about the skeleton they “discovered” in their Science journals, as mentors ask questions. They can sketch, write, or both:

- What kind of humanoid did you find?
- How is it the same and different from us?
- How many bones are in the skeleton?
- How many bones do you see may be for the appendages? The main body region?
- Describe the bones. Are they solid or hollow? Dark? White? Why?
- How long are the finger bones? Arm bones?
- How wide is the cranium? The hips?
- Describe your skeleton as a whole. How many appendages? What is the general form of your creature?
- Thinking about why humans have large craniums, long legs, or thumbs for instance, why does your humanoid look the way it does? (Does it have long fingers for digging?)

4. Class Discussion:

- Students share ideas for their humanoid.

Artist's Rendering:

1. Students are given various articles on Lucy the Hominid. They read them individually or in pairs, trying to answer the following questions:

- Who or what is Lucy?
- Where was Lucy discovered?
- What was special about Lucy's skeleton?
- Why did hominids start to walk on 2 feet? Was there an advantage?
- Compare Lucy to other hominids discovered?
- How tall was Lucy?
- What shape did her skull have?

2. Teacher shows photos of Lucy's skeleton and renderings of what she may have looked like. “An animal's skeletal system protects their bodies, allows them to stand, sit, or perform other movements. The evolution of our skeleton is caused by our basic need to survive. For example, why do you think elephants have flat teeth and lions have large sharp teeth?”

- What do all animals need to survive?

3. Teacher presents the model of an adult human skeleton. Students discuss the comparison of their own skeleton and Lucy's. Teacher asks:

- Why do you think Lucy is shorter than humans?
- What shape is her skull? Her jaw?
- Why do we have a bigger brain?
- How did the features of Lucy's skeleton help her species survive?

4. Students are given time to look at their notes from Part 1 (description of the bones in the skeletal system they are creating) and make any changes. Teacher asks questions:

- How did your humanoid get food? What bones tell you this?
- How did they get shelter?
- How did they move?
- What did they eat? Do you think they were predators or prey?
- How did they get water?

5. Students are given time to create an artist's rendering of the humanoid they discovered.

Creating Skeletal remains:

1. Teacher and students read article: "The Top Ten Human Evolution Discoveries from Ethiopia"

<http://www.smithsonianmag.com/science-nature/the-top-ten-human-evolution-discoveries-from-ethiopia-67871931/?no-ist>

2. Students are provided with photos and articles about previously found ancient remains.

3. Students use their notes and artist's renderings to create the skeletal remains that they discovered.

Final Day:

Students will act as archeologists, presenting the remains they discovered and their artist's rendering of what their creature may have looked like, making sure to explain why their humanoid had special characteristics unlike human beings today.