Science Unit: ***Human Anatomy – How Do We Move?***

Lesson 1: ***The Skeletal System***

School year:	2007/2008
Developed for:	Henderson Annex Elementary School, Vancouver School District
Developed by:	Dr. Beth Snow (scientist), Nick Marino, and Tracy Gates (teachers)
Grade level:	Presented to grades 3-5; suitable for 3-7 with age-appropriate modifications but optimally matches Grade 5 curriculum.
Duration of lesson:	1 hour and 15 minutes

Objectives

1. Learn about the skeletal system.
2. Learn about joints
3. Practice taking measurements and recording observations.

Background Information

This is the first in a six-part series of "Human Anatomy" activities that all focus around the question: "How Do We Move?" Subsequent sessions will focus on the muscular system (moving us around), the circulatory system (getting needed supplies (nutrients, oxygen) to the working muscles), the respiratory system (providing oxygen needed for, and getting rid of carbon dioxide created by, physical activity), digestive system (providing the energy we need to undertake physical activity), and the nervous system (the system that coordinates the activity).

Vocabulary

Word:	
bone	the structures that make up the skeleton; contain a lot of calcium
skeleton	made up of the bones, the skeleton is a structure that provides the framework of the body
joint	the place where two bones meet; joints are places where we can bend our skeleton.

Materials

- model of a skeleton
- poster of a skeleton
- posterboard (1 per 2 children)
- ruler
- brass fasteners
- scissors
- measuring tapes
- pencils & markers
- worksheet (see last page of this document)

In the Classroom

Introductory Discussion

1. Show the students the model of the skeleton. Tell them that this is a model that looks like the skeleton inside their own bodies.

- Point out bones on the skeleton and ask students to identify those bones on their own bodies (e.g., femur = thigh bone)

2. Short description of other items to discuss or review.
   - Having a skeleton is important for being able to move around (otherwise we would just be a big blob!)
   - Bones are also important in protecting the organs inside our bodies (e.g., the skull protects our brain; the rib cage protects our heart and lungs) – we will be learning about some of these organs in the upcoming weeks, and it is the place where our body makes blood cells (this happens inside the bone marrow)
3. The activity today is going to be to build a skeleton!
   - We are going to measure our own bodies and then build model of our skeleton out of paper.
4. Science is a process where the scientist makes predictions and makes observations to test their predictions. While we won't be doing a full experiment today (we will in future sessions), we will be doing a number of things that scientists do on a regular basis.
   - Making observations and measurements is an important part of science. One of the fun things about learning about human anatomy is that we all have a body – it's like being our own walking science lab!
   - Scientists often build models of things in order to study them. Sometimes you can't study something directly (for example, we can't take our skeleton out to look at it!) and so you build a model to study and test instead.
5. Safety guidelines.
   - Always be careful when using scissors!

Science Activity

Activity Title: Building Your Own Skeleton!

Purpose of Activity: To make observations about your own skeleton in order to build a model skeleton.

Methods and Instructions:

Set-up prior to experiment: List the names of the bones you want the students to include in their skeleton on the chalkboard:

- skull
- spinal column (actually made up of a whole lot of small bones)
- rib cage (also made up of a smaller bones)
- pelvis
- femur (thigh bone)
- tibia (shin bone)
- foot (a whole bunch of little bones)
- toes
- humerus (upper arm bone)
- radius (forearm – the bone that ends at the wrist)
- hand (a whole bunch of little bones)
- phalanges (finger bones)

The students will do the following to build a skeleton:

1. Measure the bones listed on the chalkboard using themselves as a model.
2. Record the measurements for each bone on the attached worksheet.

3. Draw each of these bones on posterboard. Label each bone with its name (to remember which is which) and with the student's name (so the bones of different students don't get mixed up).
4. Cut out each bone.
5. Connect bones using glue or brass fasteners (brass fasteners should be used for the following joints: wrist, elbow, shoulder, ankle, knee, hip)

Closure Discussion

1. What is different between the model skeleton that you built and the real you?
2. What did you learn about bone sizes? Where are big bones? Little ones? Why?
3. Some of the bones we connected with brad connectors and some we glued together. Why did we use brads to joining some bone but not others? How are brad connections like joints?
4. How could this skeleton move?

References

1. Bones. <http://www.newtonsapple.tv/TeacherGuide.php?id=1534> Twin Cities Public Television. Accessed 1 February 2008.

Image Credit

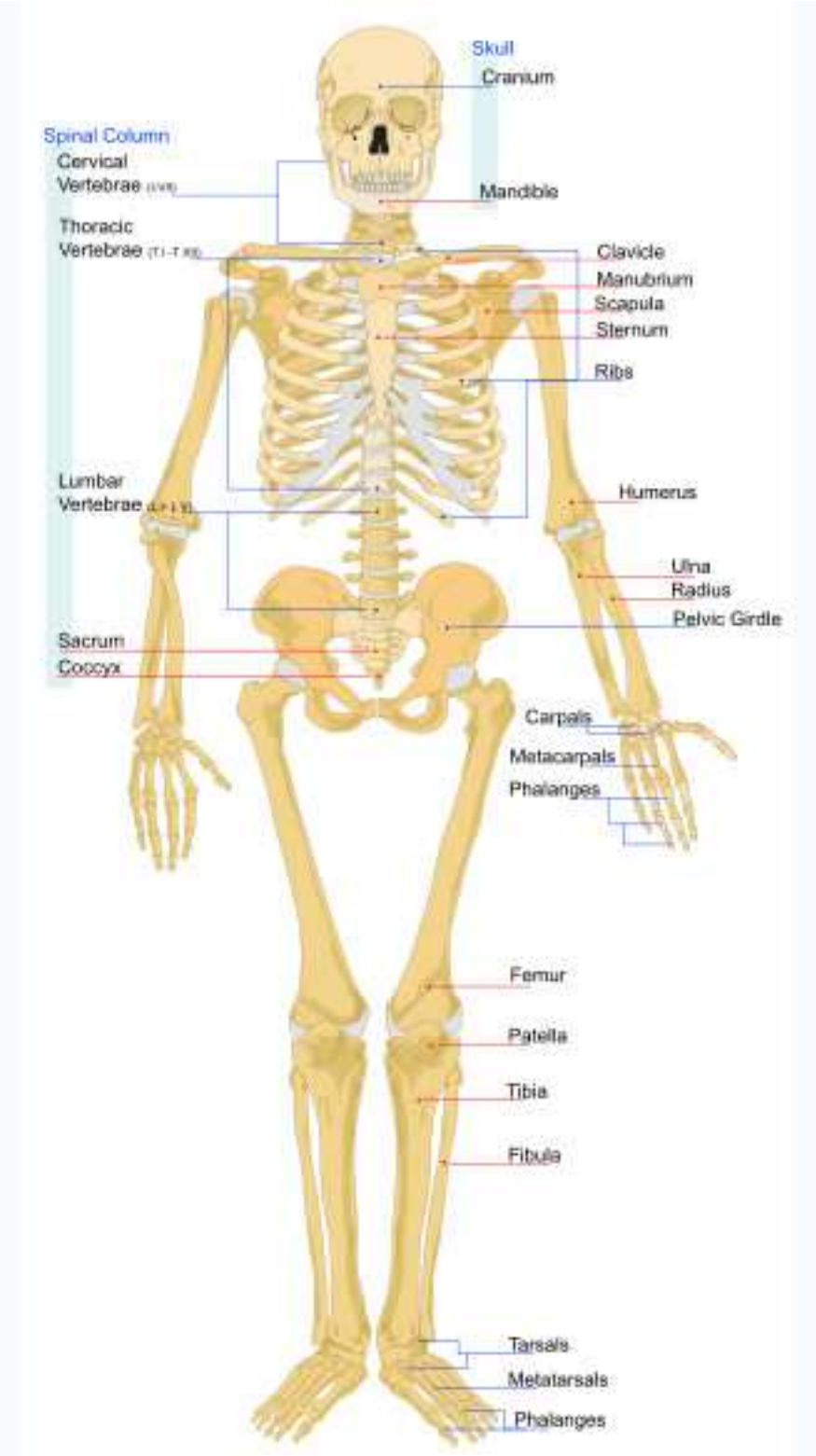
The image of the skeleton is in the public domain. It was obtained from
http://en.wikipedia.org/wiki/Image:Human_skeleton_front.svg

Extension of Lesson Plan

1. Given time constraints, we had the students pick either an arm or a leg to construct (rather than the entire skeleton). With more time, the students could build an entire skeleton.
2. If you wanted to build a skeleton that was smaller than life size, you could have the students convert their measurements (for example, if you wanted the students to make a skeleton that was half of life sized, you could have them divide all their measurements in half; this would be a good exercise for using their mathematics skills).

The Skeletal System:

WORKSHEET



Name: _____ Date: _____

BONE NAME	**INSTRUCTIONS**	**MEASUREMENT (CENTIMETRES)**
Skull	How tall is your head?	
Spinal Column	How long is your spine?	
Rib Cage	How wide is your rib cage?	
Pelvis	How wide is your pelvis?	
Femur (thighbone)	How long is your femur?	
Tibia (shinbone)	How long is your tibia?	
Foot	How long is your foot?	
Toes	How long are your toes?	
Humerus (upper arm)	How long is your humerus?	
Radius (lower arm)	How long is your radius?	
Hand	How long is your hand?	
Phalanges (fingers)	How long are your fingers?	