

# What Makes This Machine Of Ours Work?

**Grade Level:** Third Grade

**Written by:** Julie Krch, McGill Elementary McGill, Nevada

**Length of Unit:** Five lessons

## I. ABSTRACT

This unit will explore the skeletal system of the human body. The students will take an in-depth look at the skeletal system and how it works. The strategies that will be used include observation, processing, comparing and organizing techniques. The integration of subjects will allow reading, math, science and writing skills to be taught concurrently. A variety of media will be used to research and develop the final project. The final project will be publishing a popup book to show the knowledge gained.

## II. OVERVIEW

### A. Concept Objectives

1. The students will gain an understanding of the bone function of the human skeleton.
2. The students will understand the articulation of the human joint.
3. The students will understand the relationship between the skull and the cranium.
4. The students will understand the varied ways in which to publish knowledge gained.

### B. Content from the *Core Knowledge Sequence*

1. Skeleton; bones; marrow
2. Skull; cranium
3. Joints
4. In some writings, proceed with guidance through a process of gathering information, organizing thoughts, composing a draft, revising to clarify and refine his or her meaning, and proofreading with attention to spelling, mechanics and presentation of a final draft.

### C. Skill Objectives

1. The students will observe the movement of the body in the act of running/jumping.
2. The students will locate and name some of the major bones in the human body.
3. The students will compare own body to a freestanding model.
4. The students will determine the number of bones in a human body.
5. The students will observe the joints found in the hands.
6. The students will use the Internet to compile correct information.
7. The students will use correct spelling, punctuation and usage to prepare a factual display.
8. The students will develop a science board and use the Scientific Method
9. The students will develop and publish a pop-up book.
10. Students will perform a musical number.

## III. BACKGROUND KNOWLEDGE

### A. For Teachers

1. Core Knowledge Foundation. *Core Knowledge Sequence*. Charlottesville, Va: Core Knowledge Foundation, 1999, ISBN 1-890517-7
2. Moore, Jo Ellen *The Human Body Science Picture Cards*. Monterey, Ca: Evan-Moore Corp, 1998, ISBN 1-55799-692-X

3. Polly, Jean Armour. *The Internet Kids and Family Yellow Pages Millennium Edition*. Berkeley, Ca: Osborne/McGraw-Hill, 2000, ISBN 0-07-212185-8
- B. For Students
  1. The students will have a basic knowledge of the skeletal system: skeleton, from prior Core Knowledge lessons in first grade.

#### IV. RESOURCES

- A. Moore, Jo Ellen *The Human Body Science Picture Cards*
- B. Polly, J. *The Internet Kids and Family Yellow Pages Millennium Edition*
- C. Seabury, D. *Ready to Use Science Activities for the Elementary Classroom*
- D. Cole, J. *The Magic School Bus The Search for the Missing Bones*
- E. Gross, R A Book *About Your Skeleton*

#### V. LESSONS

##### **Lesson One: Observation Of The Basic Body Movement.**

- A. *Daily Objectives*
  1. Concept Objective
    - a. The students will gain an understanding of how the human body moves.
  2. Lesson Content
    - a. How the skeleton works
    - b. Pre-write using a web
  3. Skill Objective(s)
    - a. The students will verbalize prior knowledge.
    - b. The students will experiment and observe changes with the human body.
    - c. The students will follow oral directions.
- B. *Materials*
  1. Butcher or chart paper
  2. Markers
  3. Jump ropes one for every other student
  4. White construction paper 11 1/2 X 18 (one for each student)
  5. Line paper twelve sheets per student
- C. *Key Vocabulary*
  1. Skeleton-the framework of bones that supports and protects the body of a human being or an animal with a backbone.
  2. bones-a hard dense tissue which makes up the skeleton.
  3. Spinal column-the backbone
  4. Ligaments-a tough band of tissue that connects bones or holds a muscle or body organ in place.
- D. *Procedures/Activities*
  1. Brainstorm ideas from prior knowledge concerning how the skeleton might react to exercise (accept all ideas). Produce a K-W-L chart for visual learners.
  2. Make an alphabet dictionary. Fold the white paper in half cover the white paper with the construction paper and staple. Place one letter of the alphabet on each page. This will be used for key vocabulary words throughout the unit.
  3. Pass out jump ropes one for every other student.
  4. Take students to gym or outside.
  5. Have the students watch as the partner jumps rope.
  6. Observe how the body is moving while jumping.
  7. When students have all had a chance at jumping bring back to class for discussion.

8. Using the chart paper draw a web
- E. *Assessment/Evaluation*
1. Students will be able to discuss their observation on the movement of their partner's body while jumping. Ask students what bones or skeletal parts were moving while jumping.
  2. Students will write a paragraph on their observation, using the writing web just completed.

### **Lesson Two: Are My Bones Important?**

- A. *Daily Objectives*
1. Concept Objective
    - a. The students will understand why bones are so important to our human skeleton.
  2. Lesson Content
    - a. The relationship between the skeleton and bones.
    - b. marrow
  3. Skill Objectives
    - a. The students will read for understanding.
    - b. The students will re-phase material
    - c. The students will write an organized paragraph
- B. *Materials*
1. *A Book About Your Skeleton* by Ruth Belov Gross-ISBN# 0-590-48312-9 (one for every student)
  2. Chart paper
  3. Marker
- C. *Key Vocabulary*
1. Joints-a place where two or more bones come together
  2. Cartilage-a tough, white elastic substance that is attached to the surfaces of bones at joints and hold the bones in place.
  3. Rib cage-are bones that enclose the chest cavity of human beings and most other vertebrates.
  4. Rib-one of the pairs of long curved bones that extend from the spine toward the breastbone
  5. X-ray-A powerful light ray that can pass through substances that ordinary ray of light cannot go through.
- D. *Procedures*
1. Add the key vocabulary words to the students' Alphabet book
  2. Hand out the book *A Book About Your Skeleton*
  3. Buddy read in groups of two (teacher will select buddies)
  4. Students will read the short book (a non-fiction graded at 2nd-3<sup>rd</sup> level).
  5. Students will find four aspects of the book they believe are important.
  6. Class will come together and share their ideas.
  7. From the students' information, the teacher will list important aspects of the book on chart paper (web form).
- E. *Assessment/Evaluation*
1. Students will write an organized paragraph on information covered in reading material and classroom discussion.
  2. This type of assessment will allow the teacher to assess the students' comprehension as well as sentence structure.

### **Lesson Three: Why Do We Have Bones?**

- A. *Daily Objectives*
1. Concept Objective
    - a. The students will understand why bones are so important to our human skeleton
  2. Lesson Content
    - a. Skeleton, bones, marrow
    - b. Skull; cranium
  3. Skill Objectives
    - a. Compare own body to a free standing model
    - b. Locate some of the major bones in the human body.
- B. *Materials*
1. Skeleton ditto (Mr. Bones) *Ready to Use Hands On Science Activities*, by Debra Seabury, page 104
  2. Sixteen fasteners for Mr. Bones
  3. Classroom model of a human skeleton/poster
  4. Names of bones on strips of tag board with Velcro strips on the back of each piece of tag board.
- C. *Key Vocabulary*
1. Sternum-breast bone where the ribs connect
  2. Scapula-shoulder blade
  3. Pelvis-hip bones
  4. Tibia-large bone in your lower leg
  5. Fibula-the front and smaller bone in your lower leg
  6. skull-the bony framework of the head that encloses and protects the brain
  7. Cranium-the part of the skull that encloses the brain
- D. *Procedures/Activities*
1. Using the classroom model of the human skeleton, students draw the name of a bone from a container (at least one bone for every student).
  2. Have students place the name of the bone on the corresponding bone of the classroom model.
  3. Allow students to have their reading material from the previous lesson available to help with placement.
  4. As student places name of specific bone on model, have the entire class touch their same bone.
  5. Students list key vocabulary words in their skeleton alphabet book.
  6. Pass out Mr. Bones ditto, have students cut out pieces of the skeleton
  7. Pass out sixteen fasteners, have the students assemble Mr. Bones correctly.
- E. *Assessment/Evaluation*
1. As students assemble Mr. Bones the teacher can observe students for competency of subject matter.
  2. Web site available for assessment/evaluation  
[www.lhs.berkeley.edu/shockwave/bones.html](http://www.lhs.berkeley.edu/shockwave/bones.html)  
<http://tqunior.advanced.org/5777/ske7.html>  
The first web site allows the student to put the skeleton together  
The second web site is a wonderful site for factual information gathering

### **Lesson Four: What Allows Us To Move Freely?**

- A. *Daily Objectives*
1. Concept Objective
    - a. The student will understand why joints are so important in everyday life.

2. Lesson Content
    - a. joints
  3. Skill Objectives
    - a. The student will experiment and observe changes
    - b. The student will follow oral instruction
    - c. The student will work in a team
    - d. The student will observe the joints in the hand
    - e. Perform everyday task with hand joints immobilized
    - f. The students will be able to compare and contrast
- B. *Materials*
1. Masking tape
  2. Popsicle sticks (one for each student)
  3. Newspaper
  4. rubber bands
  5. pennies
  6. scissors
  7. index cards
  8. pencils
  9. paper
  10. sticker
  11. envelopes
  12. Mr. Bones from previous lesson
- C. *Key Vocabulary*
1. Review joints-a place where two or more bones come together
- D. *Procedures/Activities*
1. Mr. Bones from previous lesson is available to each student
  2. Brainstorm where the joints might be in the human body
  3. Students can use their skeleton alphabet book to help review the definition of a joint.
  4. Students will find knee, elbow and shoulder joints and experience moving and thinking about what is happening.
  5. Divide students into groups of two (one boy-one girl) if possible.
  6. Demonstrate the procedure on taping each others hand
  7. Using the masking tape girls will tape the thumb to the index finger. Make sure the tip of the thumb is taped.
  8. Boys will tape around the index and middle fingers out near the tips of the fingers slide the Popsicle stick under the tape in the space between the backs of the fingers. Place tape around the wrist holding the Popsicle in place.
  9. Have the students complete these simple tasks:
    - a. roll newspaper and place a rubber band on it
    - b. using scissors cut a circle from the index cards
    - c. stack pennies
    - d. pick up popcorn seeds and place in a small container
    - e. Write a sentence about experiment, fold paper, place it in envelope place sticker on outside of envelope.
  10. Brainstorm observations
  11. Record observations on chart paper
- E. *Assessment/Evaluation*
1. Students will write a paragraph on how important joints are to our daily lives.
  2. Students will produce a science board demonstrating the scientific method.

### **Lesson Five: How Many Of These Bones Do We Have?**

#### **A. Daily Objectives**

1. Concept Objective
  - a. The student will count the bones in the human body
2. Lesson Content
  - a. How many bones are in the human body
3. Skill Objectives
  - a. Students will work in teams
  - b. Students will count bones from classroom models
  - c. Students will count by twos
  - d. Students will record their findings
  - e. Students will use measuring skills to find their measurements

#### **B. Materials**

1. *Bones! Bones! Bones!* By Luann Colombo
2. *All About Bones* kit by Becker & Mayerl
3. Human Body Poster
4. Human Skeleton by Skilcraft (kit)
5. A worksheet for counting of bones (Appendix A)
6. Ready to use Science Activities page 106
7. Tape measure

#### **C. Key Vocabulary**

1. Symmetry-an exact matching of parts on opposite sides of a dividing line or around a central point

#### **D. Procedures/Activities**

1. Have students place the word symmetry in skeleton alphabet book and discuss
2. Group students by determining how many human skeleton models you have available to you.
3. Pass out the worksheet (Appendix A)
4. Have students count bones
5. Students must either count by two's or multiply by two
6. Pass out Ready to use Science Activities page 106
7. Pass out tape measures have students work in pairs and measure themselves

#### **E. Assessment/Evaluation**

1. Observation of students counting bones on models.

### **VI. CULMINATING ACTIVITY**

1. Students will learn the song *Dem Bones* and perform for parents at the Spring concert.
2. The students will construct a pop-up book with factual information
3. Students will share with first grade as a cross age reading group
4. Guest Speaker, Chiropractor, school board member

### **VII. STUDENT WORKSHEETS/HANDOUTS**

Appendix A

### **VIII. BIBLIOGRAPHY**

- A. Core Knowledge Foundation. *Core Knowledge Sequence*. Charlottesville, VA: Core Knowledge Foundation, 1999, ISBN 1-890517-7

- B. Moore, Jo Ellen *The Human Body Science Picture Cards*. Monterey, Ca: Evan Moore Corp, 1998, ISBN 1-55799-692-
- C. Polly, Jean Armour, *The Internet Kids and Family Yellow Pages Millennium Edition*. Berkeley, Ca: Osborn/McGraw-Hill, 2000, ISBN 0-07-212185-8
- D. Seabury & Peeples, *Ready to use Science Activities for the Elementary Classroom*. The Center for Applied Research in Education, Inc. 1997 ISBN 0-87628-743-7
- E. Gross, Ruth, *A Book About Your Skeleton*. Scholastic Inc. 1994 ISBN 0-590-48312-9
- F. Colombo, Luann *Bones! Bones! Bones!* Becker & Mayerl, Bellevue, Wa, 2001 ISBN 0-9700346-4-4
- G. Spellman, Susan *All About Bones*, Becker & Mayerl, Bellevue, Wa, 2001
- H. *Britannica Science System, FOSS*, University of California, 1993 ISBN 0-7826-0046-8

## Appendix

### A

**Using the table below fill in the amount of bones that you and your partner have counted.**

- |                        |             |
|------------------------|-------------|
| 1. Upper arm _____     | x 2 = _____ |
| 2. Lower arm _____     | x 2 = _____ |
| 3. Wrist _____         | x 2 = _____ |
| 4. Hand _____          | x 2 = _____ |
| 5. Upper leg _____     | x 2 = _____ |
| 6. Lower leg _____     | x 2 = _____ |
| 7. Ankle _____         | x 2 = _____ |
| 8. Foot _____          | x 2 = _____ |
| 9. Face Bones _____    | x 2 = _____ |
| 10. Cranium _____      | x 2 = _____ |
| 11. Jaw Bones _____    | x 2 = _____ |
| 12. Shoulder _____     | x 2 = _____ |
| 13. Breast bones _____ | x 2 = _____ |
| 14. Rib bones _____    | x 2 = _____ |
| 15. Back bones _____   | x 2 = _____ |
| 16. Hip bones _____    | x 2 = _____ |

**TOTAL AMOUNT OF BONES IN THE HUMAN  
BODY \_\_\_\_\_!!!!**

## What Makes This Machine of Ours Work?