

Skeletal System & Bone Health

Times based on 50 minute class periods

Title: Skeletal System & Bone Health

Engage: (Class 1)

- The teacher will pose the following probing questions to the class:
 - o What is the purpose of the skeletal system?
 - o Are all bones the same?
 - o Does bone health matter?
 - o Do you have healthy bones? How do you know?
 - o What can you do to keep your bones healthy?
- The students will participate in a discussion pertaining to the questions and other topics that arise. The teacher will moderate the discussion, asking questions to continue it.

Explore (Class 1)

- In order to answer the above questions, the students will work in groups to research the answers to each question in a SOLE fashion:
 - o Group 1 – Does the skeletal system have a purpose?
 - o Group 2 – Are all bones the same?
 - o Group 3 – What does it mean to have healthy bones?
 - o Group 4 – What can we do to maintain bone health?
 - o Group 5 – What factors affect bone health?

Explain (Class 2)

- Each group will share with the class the information they found pertaining to their question, as per the SOLE flow. Groups may perform skits, make visual presentations, or use an oral presentation format to share their information. Each presentation should be about 5 minutes.
- The teacher will fill in necessary information related to the questions in a “yes – and!” manner so that the appropriate information is available to all students.
- During each group’s presentation, the other students will write down 2 – 3 facts they learned. These facts may or may not be shared throughout the period at the teacher’s discretion.

Elaborate (Class 2 or 3)

- The students will perform an activity to discover how bone health is important to bone function (protection & support functions, mainly) and how bone density and strength are related.
- Each group of students will receive a snack bag full on honey comb cereal (osteons look like honeycombs) prepared by the teacher.
 - o Bag 1: 100% full (as many **whole** honeycombs as will fit are in the bag)
 - o Bag 2: 10 % loss/90% full (subtract 10% from full; be sure no excess air is in bag)
 - o Bag 3: 20% loss/ 80% full (subtract 20% from full; no air)
 - o Bag 4: 30% loss/70% full (subtract 30% from full; no air)
 - o Bag 5: 50% loss/50% full (subtract 50% from full; no air)
- The teacher will project a table with the total number of honeycombs for each bag.
- Students will place the snack bag on the ground.
- Each group will drop (NOT throw!) the same textbook from desk/table height onto the bag.

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- Then, the students will empty the contents of the bag onto a paper towel and count how many whole honeycombs are left.
- Using this information, students will calculate the % of honeycomb cereal that was broken and the % of honeycomb cereal
- As the finish counting, students will come up to the board and fill in their information on the projected table in the corresponding row: number broken, number unbroken, % broken, % unbroken.
- After the table has been filled in, the teacher will lead the class through an analysis of the information.

Evaluate (Class 3)

- The students will construct the following graph from the data gathered during the activity: % honeycombs broken (bone strength) vs. % loss (bone density).
- The students will then answer the following questions (worksheet or looseleaf)
 - o Explain the relationship between the % loss and the % of honeycombs broken using the graph.
 - o Relate the terms bone density and bone strength to the % loss and % of honeycombs broken.
 - o Apply the information from the graph to the relationship between bone density and bone strength.
 - o Identify 3 risks to bone health and 3 ways people can keep their bones healthy.
 - o Why is bone health important?

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