

Calcium Makes My Bones and Teeth Strong

Lesson Description

Students learn the important role of bones in the body and discuss ways to keep their bones and teeth healthy. They will learn the recommended daily number of servings of calcium rich foods and be able to identify both dairy and non-dairy sources. Calcium rich foods from the traditional Native diet are included.

- Time required: 60 minutes
- Location of lesson: Classroom

Learning Objectives

- Be introduced to the role of bones in the body and identify ways to keep bones and teeth healthy.
- Learn about the need for 3 servings of calcium rich foods every day.
- Identify some dairy and non-dairy calcium rich foods, including foods from the traditional Native diet.

Attitude and Behavior Goals

- Students will eat a variety of calcium rich foods.

Materials and Preparation

*Choose 1 or more of these 3 activities: Chicken Bone experiment, Tums in Soda experiment, or Catch the Calcium Relay Race:

- 1. Chicken bone experiment
 - 1 glass jar
 - 2 clean chicken bones, 1 soaked in vinegar for 8-10 days and 1 not soaked
 - Vinegar, enough to fill the glass jar and cover the chicken bone
 - Plastic gloves, several pairs for students to share
 - Preparation for Chicken Bone Experiment
 - Fill the glass jar with vinegar. Place one cleaned chicken bone in the vinegar (leg or drumstick bone works best). Allow bone to soak in the vinegar for 8-10 days before the experiment. Clean and dry the other bone.
- 2. Tums in Soda experiment
 - Calcium carbonate tablets (like Tums brand) - 1 or 2
 - 1 clear jar or cup
 - Soda such as Coca Cola or Diet Coca Cola brand, about 1 cup
- 3. Catch the Calcium Relay Race Activity

-  **Food Cards**, printed and cut out (laminated if possible) - 2 sets
- 4 brown paper bags, lunch sized or grocery sized
- Pen or marker to label the bags
- Preparation for Catch the Calcium Relay Race Activity
 - Print and cut out 2 sets of the **Food Cards**. Label 2 bags “Calcium Foods” and label the other 2 bags “Other Foods”. Identify a space inside or outside with ample room, clear of obstacles, for students to run the relay race.
-  **Calcium Rich Foods that Build Strong Bones and Teeth**
-  **Bones and You**
- Prepared vegetable snack of the week – 1 for each student
- Water to drink during the Class Warm-up – water dispenser in the classroom and 1 cup or a water bottle for each student

Class Warm-up: Champion Cheer and Veggie Taste Test (5-10 minutes)

- Give each student a cup of water or ensure that they have a filled water bottle in front of them.
- Give each student the prepared veggie snack of the day.
- Lead the students in enthusiastically reciting the  **Champion Cheer**.
- At the end of the cheer, drink water and eat the veggie snack together.
- Have students complete their  **Taste Test Observations** about the vegetable snack of the week.

Review of Last Lesson (2-3 minutes)

- Review the evaluation questions from last week’s lesson. Evaluation questions from all lessons are listed at the end of the workbook .

Class Discussion (10 minutes)

Have any of you ever broken a bone? Healthy, strong bones are very important! Without our bones that make up our skeletal system, there would be nothing to support our bodies. Bones need a mineral called calcium to help build them up. Calcium is in many of the foods we eat. What are some ways we can help our bones and teeth to be strong and healthy?

Eating foods with calcium and getting plenty of exercise are two very important ways to build strong bones and teeth. Milk and dairy products like cheese and yogurt have lots of calcium. There are lots of other foods that have calcium too. Green leafy vegetables (broccoli, spinach, kale, other greens), almonds, acorns and acorn stew, posole and soups made with bones, cactus leaves, beans, canned salmon or sardines, fortified breakfast cereals and fortified soy milk or orange juice also have calcium.

Who can guess how many servings of calcium rich foods we should eat each day? (Answer: 3 servings/day)

Activities (40 minutes)

-  **“Building Strong Bones and Teeth” (10 minutes):** Students complete a workbook page about the bones in their body.
 1. Refer students to the workbook page,  **Bones and You**. Refer to the workbook answer key for the answers. Read the instructions on the workbook page and have students fill in the blanks together as a class as you go through the following discussion:
 - a. *Can anyone guess how many bones are in your body? (Answer: 206!)*
 - b. *Where is the smallest bone in your body? (Answer: The ear. The bone is called the stapes. It looks just like a stirrup on a saddle. It is the size of a grain of rice, but really important in helping you to hear.)*
 - c. *Where is the strongest bone in your body? (Answer: It is in the top of your leg, called the femur. It is also the longest bone in your body).*
 - d. *What do bones do for the body?*
 - i. Support the body.
 - ii. Protect the body. The skull protects the brain. We need the brain to think! The rib cage protects the heart and lungs. We need the heart and lungs to pump blood and to breathe.
 - e. *Calcium helps build our bones and make them strong. We get it from foods like milk.*

-  **“Calcium Rich Foods: 3 a Day” (15 minutes):** Students complete a workbook page about calcium rich food sources.
 1. Refer students to the workbook page,  **Calcium Rich Foods that Build Strong Bones and Teeth**.
 2. Review foods that are a good source of calcium: milk, yogurt, cheese, soy milk and other milks, leafy green vegetables like spinach, kale, broccoli, celery, almonds, posole and soups that are cooked with bones, cactus leaves, beans, canned fish, breakfast cereals, fortified orange juice.
 3. Have students draw and label their favorite calcium rich food in the space provided on the workbook page,  **Calcium Rich Foods that Build Strong Bones and Teeth** and answer the 2 true or false questions.
 4. *How many servings of calcium rich foods should we eat each day? (3) Who has had 3 servings of calcium rich foods today? What will you eat for the rest of the day to make sure you are getting enough calcium?*

*Choose 1 or more of the following activities as time allows: Chicken Bone experiment, Tums in Soda experiment, or Catch the Calcium Relay Race.

- **“Chicken Bone Experiment” (10 minutes):** Students observe a chicken bone that has been soaked in vinegar to see what happens when calcium is pulled out of bones.
 1. Put on a pair of plastic gloves. Show the vinegar soaked chicken bone to the entire class. *This is a chicken bone that has been soaked in vinegar (a weak acid).* Demonstrate how it is bendy. *What do you think happened to the bone?* (Answer: Calcium has been pulled out of the bone by the vinegar. Vinegar is a mild acid)
 2. Pass out plastic gloves for students to put on before touching the bones.
 3. Pass around the vinegar soaked bone. Pass around the regular bone that has not been soaked in vinegar. Ask students to make observations.
 4. Discuss:
 - a. *How are the bones different from each other?*
 - b. *Can you bend the bones that have been in the vinegar?*
 - c. *Why is it not good for the bones in your body to be weak like the vinegar soaked bones?*
 - d. *Vinegar has acid in it that pulls calcium out of the bones. If we don't eat foods high in calcium, bones can become weak and flexible and easier to break.*

- **“Tums in Soda” (5-10 minutes):** Students observe a calcium carbonate tablet (like Tums) being broken down by acids in soda.
 1. Place 1 calcium carbonate tablet in the soda (coke and diet coke work especially well). Watch the tablet fizz as the acids in the soda break down the calcium
 2. Discuss: *This tablet is made of calcium carbonate, the same substance in our teeth. It's important to choose calcium rich foods and drink water instead of soda. Even diet soda can break down your teeth and bones.*

-  **“Catch the Calcium Relay Race” (10-15 minutes):** Students play a fun relay race game to identify calcium rich food sources. This can be done inside or outside.
 1. Divide the class into 2 teams. Give each team 2 bags; 1 labeled “Calcium Foods” and the other labeled “Others”. Place 1 set of the food cards for each team- picture side up- on the floor at one end of the room.
 2. Students stand on one end of the room. When it is their turn, they run to the other side of the room where the food cards are placed. They select a food card, run back to the team and place the card in the appropriate bag (Calcium Foods or Others). The other team members may help the student

decide which bag to place the food in. The next student in the relay may start only when the food card is placed in a bag. Once in a bag, the food card cannot be switched to another bag.

3. The teams finish when all the food cards have been selected and placed in a bag. The first team to finish is not necessarily the winner! Only if they have more correctly placed food cards than the other team will they win. If the slower team has more correctly placed food cards, the faster team will have to hand the win over to the other team.
4. Go through the food bags of each team and discuss the proper placement of the food cards. Refer to correct answers here (These answers are based on a calcium rich food defined as containing at least 100mg of calcium per standard serving):
 - a. Calcium rich foods: Milk, Cheese, Yogurt, Cheerios, Broccoli, Orange Juice (fortified- we'll assume it is), Spinach, Ice Cream, beans, almonds
 - b. Others: Bread, Watermelon, Apple, Carrots, Hamburger patties, Tortillas, Rice, Eggs, Banana, Toast, Shrimp, French Fries, Hot Dogs, Tomato, Fry Bread, Peanut Butter, Pastries, Chicken, Cake, Pasta, Blueberries, Corn, Potato, Meat, Strawberries, Crackers, Celery, Lettuce

Evaluation Questions (5 minutes)

1. *Name 2 things your bones do for the body.* (Answer: support and protect)
2. *What happens to your bones if you don't eat enough calcium?* (Answer: they become weak and fragile)
3. *How many servings of calcium rich foods do you need to eat every day?* (Answer: 3)
4. *What are some examples of calcium rich foods?* (Answer: any dairy product such as milk, cheese, yogurt, leafy greens such as spinach, broccoli, almonds, fortified breakfast cereal, soymilk, cactus leaves, soups made with bones such as posole)
5. *Besides eating calcium rich foods, what else can we do to build strong bones and teeth?* (Answer: exercise)
6. *How much water should you drink every day?* (Answer: at least 6 cups of water a day)
7. *How many fruits and vegetables should you eat every day?* (Answer: at least 5 fruits and vegetables a day)
8. *Does gardening connect you to your culture and help you learn new words in your language?* (Answer: yes)

Preparation for Future Lessons – Reminder for the Instructor

- Review the materials and preparation needed for the next lesson.

- Remember that an Elder guest instructor is needed for these Spring lessons: lesson 1 (Eating a Rainbow), lesson 4 (Water and Precipitation), and lesson 9 (Plant Parts: Identifying Parts of a Flower).

Notes
