



think
before
you
drink

CONCEPTS:

Scientists agree that diets deficient in calcium during childhood and adolescence contribute to the development of osteoporosis, which is not visible until later in life. It is during the teen years that optimal calcium intake is most important. Bones grow and incorporate calcium most rapidly during this time. A calcium-rich diet is essential for healthy, strong bones.

OBJECTIVES:

- Students will investigate the nutritional content in a variety of beverages by measuring the amount of sugar at stations.
- Students will learn the effects excessive soda consumption can have on human bones by examining a chicken bone soaked in vinegar.
- Students will test their knowledge of daily calcium requirements verses actual calcium consumption by completing a worksheet on calcium intake.

MATERIALS:**ACTIVITY 1: What's in My Drink?**

- Assorted beverage containers—6 different containers per group of 4 students
 - Milk (1%, 2%, chocolate, strawberry, etc.)
 - Soda cans (not diet)
 - Cartons of fruit juice (100%, 10%, etc.)
 - Cartons of artificial fruit juice (Capri Sun®, Fruitopia®, Snapple®, Sunny Delight®, etc.)
 - Sports drinks (Gatorade®, Power Aid®, etc.)
 - Energy drinks (Red Bull®, Jolt®, etc.)
- *Think Before You Drink* PowerPoint or overheads
- *Drink Group Hypothesis* student handout
- *What's In My Drink?* student handout
- Masking tape
- Measuring spoons
- Ziploc® sandwich bags
- Calculators
- Marking pens
- 1 cereal bowl of sugar (2–3 cups) for each group
- Large paper grocery bags (1 per group)



ACTIVITY 2: Rubber Bones

- 2 clean, dry chicken/turkey bones (legs work well)
- Glass jar with lid
- White vinegar (enough to fully soak the bones)

ACTIVITY 3: Are You Getting Enough Calcium?

- *Are You Getting Enough Calcium?* student handout
- *Foods High In Calcium* student handout

TEACHER PREPARATION:

Use the *Think Before You Drink* PowerPoint or prepare overheads of PowerPoint. Copy enough *What's In My Drink?*, *Foods High in Calcium*, and *Are You Getting Enough Calcium?* student handouts for each student. Copy one *Drink Group Hypothesis* student handout for each group of four students. For activity one, collect and clean assorted varieties of empty beverage containers. Have a large paper bag for each group of four students. Each bag should have six different beverage containers. Each group of students will also need: one bowl of sugar, one set of measuring spoons, one calculator, one marker, six Ziploc bags, and masking tape to label the bags. For activity two, soak one chicken/turkey bone in a jar of vinegar for two to three days before you teach this lesson. Place the other chicken/turkey bone inside a plastic bag and seal the bag. Note that the raw bones used in this activity should be washed clean and then allowed to dry thoroughly. It is best to let the bones sit out for several days. When allowing students to handle the bones, keep them in a plastic bag.

ESTIMATED TIME:

50 minutes

INTRODUCTORY SET:

Ask students what their favorite beverages are. Have students share what nutrients they believe they get from the various beverages. Tell students that people often consider their food intake when trying to make changes in their diet, but do not often consider beverage intake. Have students brainstorm some ways that they can cut down on calories and sugar by changing their beverage choices.

ACTIVITY 1: WHAT'S IN MY DRINK?

1. Show and discuss student objectives.
2. Divide the class into groups of four students. In this activity, students will investigate how much sugar, calcium, and calories are in common beverages.

3. Distribute six Ziploc bags, a set of measuring spoons, a marker, masking tape, a calculator, and the student handouts *What's In My Drink?* (one per person) and *Drink Hypothesis* (one per group).
4. Direct each group to start with the *Drink Group Hypothesis* student handout where the group will make guesses as to which drinks are the highest and lowest according to various categories. Once the groups have completed the *Drink Hypothesis* student handout, have them begin the investigation of what drinks are in the bag and filling out the *What's In My Drink?* student handout. Each group will measure the sugar content of each container and put that sugar in the Ziploc bag. Use the tape and marker to label the bag. When cleaning up the bags can be used again for other classes. Students will need to convert grams of sugar to teaspoons by using the following formula: multiply grams of sugar by .25.
5. Ask groups to record the following information from the nutrition labels of the beverages: serving size, calories, sugar, protein, vitamins A, C and D.
6. Allow students time to record information at each of the stations.
7. When the students are done have them complete the *Drink Group Hypothesis* student handout. Ask students to report their findings. What surprised them the most? Which beverage gives you the most nutritional value? Was anyone surprised at the amount of sugar in juice?

ACTIVITY 2: RUBBER BONES

1. Ask one student to volunteer to read the ingredients on a can of soda. Discuss the effects these have on a person's bones. Predict what would happen to the bones of a teenager that substituted soda for milk and/or drank 3-4 cans of soda on a daily basis.
2. Allow students to examine and handle the dry chicken or turkey wishbone. Ask students to describe the bone.
3. Ask students to write down what they think will happen to the wishbone soaking in vinegar for a few days.
4. Remove the wishbone from the vinegar and display it, along with the wishbone that has been on the counter. Put the vinegar-soaked wishbone inside the second Ziploc bag.
5. Allow students to handle the two wishbones. Ask students how the two wishbones are different. What do they think accounts for this difference?
6. Explain that vinegar, an acid, leached the calcium out of the wishbone. A lack of calcium makes the wishbone soft and rubbery. Increased acid levels throughout the body and the large amounts of sugars in sodas and some juices removes nutritious minerals such as calcium from bones allowing the bones to become weak over time and increasing the risk of bone fractures and osteoporosis later in life.

ACTIVITY 3: ARE YOU GETTING ENOUGH CALCIUM?

1. Ask students to work in small groups to calculate how much calcium they consume in a typical day. Help them discuss how their calcium intake is likely to affect their own bone health.
2. Distribute the *Foods High in Calcium* student handout and discuss foods that are good sources of calcium. Using the *Are You Getting Enough Calcium?* student handout, ask students to record their calcium intake for one day.
3. How many students fell short of the daily calcium requirement? How many achieved the requirement?
4. Ask students for their reactions to the outcome. Where they surprised or did they suspect they were under or over the recommended daily input? What can you do to increase your intake of calcium?

Conclusion:

Ask students to make some goals for the next few weeks. They should make a goal about their beverage intake and their calcium intake. In setting goals include the following:

1. What is the goal?
2. How will it be measured?
3. What is the timeline?
4. Who can help you be successful with this goal?