Lesson Title: Think Before You Drink

Standards
This lesson aligns with the OSPI Health and Fitness Standards.
This lesson will address GLE 1.5.1 – Applies nutrition goals based on dietary guidelines and individual activity needs.
GLE 1.5.4 – Analyzes health and unhealthy eating patterns.
GLE 2.2.4 – Analyzes benefits of maintaining a balance of health habits (stress, sleep, exercise, nutrition, recreation, and school).
GLE 4.1.1 – Analyzes daily health and fitness habits.

Health and Fitness Standards

Assessment
• Shop, Eat, Move!

Health and Fitness Assessments

National Health Standards
Standard 7 – Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks.

National Health Education Standards

Resources
• Health Trek – Group Health Cooperative www.healthtrek.org

Key Concepts
• Students understand nutrition labels.

Vocabulary
• Calcium
• Calories

Objective(s) for Student Learning
1. Students will investigate the nutritional content in a variety of beverages by measuring the amount of sugar in the beverages.
2. Students will learn the effects excessive soda consumption can have on human bones by examining a chicken bone soaked in vinegar.
3. 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

• Plastic sandwich bags, Ziploc®

• 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

Time: 50 minutes
Grade Level: Middle School
Unit Name: Nutrition
Lesson Number: 3
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 plastic sandwich 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.

Introductory Set

Ask students, “What are your favorite beverages?” 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 plastic sandwich 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 Group Hypothesis student handout, have them begin the investigation of what drinks are in the bag and completing the What’s In My Drink? student handout. Each group will measure the sugar content of each container and put that sugar in the plastic sandwich bag. Use the tape and marker to label the bag. When cleaning up, the plastic 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 students are finished, 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 the 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 bone. Ask students to describe the bone.

3. Ask students to write down what they think will happen to the bone soaking in vinegar for a few days.

4. Remove the bone from the vinegar and display it, along with the bone that has been on the counter. Put the vinegar-soaked bone inside the second Ziploc® bag.

5. Allow students to handle the two bones. Ask students how the two bones are different. What do they think accounts for this difference?

6. Explain that vinegar, an acid, leached the calcium out of the bone. A lack of calcium makes the bone 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. Were 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?
# DRINK GROUP HYPOTHESIS

<table>
<thead>
<tr>
<th></th>
<th>Group Hypothesis</th>
<th>Reality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calories per serving</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatest</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sugar grams per serving</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatest</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Protein grams per serving</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatest</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vitamin A percentage per serving</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatest</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vitamin C percentage per serving</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatest</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vitamin D percentage per serving</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatest</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Calcium percentage per serving</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatest</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**WHAT’S IN MY DRINK?**

Use the nutrition label on each of the beverages to fill in the information below. See which beverages give you the most nutritious “bang for your buck.”

**To convert grams of sugar to teaspoons, multiply grams of sugar by .25.** This will give you an estimation of how much sugar is in each beverage.

<table>
<thead>
<tr>
<th>Beverage Name</th>
<th>Serving Size</th>
<th>Servings Per Container</th>
<th>Calories per Container</th>
<th>Sugar – Grams Per Container</th>
<th>Sugar – tsp Per Container</th>
<th>Protein – Grams per container</th>
<th>Vitamin A – percentage per container</th>
<th>Vitamin C – percentage per container</th>
<th>Vitamin D – percentage per container</th>
<th>Calcium – percentage per container</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FOODS HIGH IN CALCIUM

DAIRY CASE
- Milk (nonfat, low fat, whole)
- Flavored (chocolate) milk
- Buttermilk
- Cheese
- Yogurt
- Parmesan cheese
- Yogurt-juice drink
- Cottage cheese
- Ricotta cheese

GROCERY SHELF
- Dry milk powder
- Pudding
- Sardines, canned with bones
- Salmon, canned with bones
- Calcium-fortified cereal
- Macaroni and cheese
- Almonds
- Buttermilk pancake mix
- Dried beans

FREEZER SECTION
- Ice cream and ice milk
- Frozen yogurt
- Ice cream bars
- Frozen pizza with real cheese
- Frozen cheese enchiladas
- Frozen waffles
- Calcium fortified orange juice

PRODUCE DEPARTMENT
- Tofu (made with calcium)
- Broccoli
- Kale
- Okra
- Spinach
- Bok choy
- Turnip greens
- Mustard greens
- Collard greens

©2009 Group Health Cooperative

Think Before You Drink Student Handout
ARE YOU GETTING ENOUGH CALCIUM?

Calcium is a mineral that is mostly present in your bones. During adolescence, about 75%–85% of the skeleton is formed. Bones grow and incorporate calcium most rapidly during this time.

Adolescents require about 1300 mg of calcium each day. See the table below for the calcium content of common foods and check the nutrition label to choose foods high in calcium when you prepare foods. Also, choose foods that are fortified with calcium.

<table>
<thead>
<tr>
<th>Food</th>
<th>Servings</th>
<th>Calcium Content</th>
<th>Foods I Ate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk, whole or low fat</td>
<td>1 cup</td>
<td>300 mg</td>
<td></td>
</tr>
<tr>
<td>Rice/soy milk</td>
<td>1 cup</td>
<td>400 mg</td>
<td></td>
</tr>
<tr>
<td>White or black beans</td>
<td>1 cup</td>
<td>130 mg</td>
<td></td>
</tr>
<tr>
<td>Fortified cereal</td>
<td>1 cup</td>
<td>300 mg</td>
<td></td>
</tr>
<tr>
<td>Broccoli, cooked</td>
<td>1 cup</td>
<td>75 mg</td>
<td></td>
</tr>
<tr>
<td>Spinach, cooked</td>
<td>1 cup</td>
<td>260 mg</td>
<td></td>
</tr>
<tr>
<td>Cheddar cheese</td>
<td>1.5 oz</td>
<td>300 mg</td>
<td></td>
</tr>
<tr>
<td>Mozzarella cheese</td>
<td>1.5 oz</td>
<td>300 mg</td>
<td></td>
</tr>
<tr>
<td>Almonds</td>
<td>2 oz</td>
<td>150 mg</td>
<td></td>
</tr>
<tr>
<td>Salmon with bones</td>
<td>3 oz</td>
<td>180 mg</td>
<td></td>
</tr>
<tr>
<td>Orange juice, calcium fortified</td>
<td>1 cup</td>
<td>300 mg</td>
<td></td>
</tr>
<tr>
<td>Orange, medium</td>
<td>1</td>
<td>300 mg</td>
<td></td>
</tr>
<tr>
<td>Sweet potatoes, mashed</td>
<td>½ cup</td>
<td>44 mg</td>
<td></td>
</tr>
<tr>
<td>Ice cream</td>
<td>1 cup</td>
<td>236 mg</td>
<td></td>
</tr>
<tr>
<td>Frozen yogurt</td>
<td>1 cup</td>
<td>200 mg</td>
<td></td>
</tr>
</tbody>
</table>

Calculate how much calcium you consume each day by looking at the chart above. Did you consume the recommended 1300 mgs?

Daily calcium intake each day: _____________ mg