Creative Food Activities for School-Age Children

Lesson Overview

Lesson Participants: CACFP personnel and school-age child care staff

Type of Lesson: Short face-to-face training session

Time Needed to Conduct the Lesson: 20 minutes

Lesson Description: This lesson focuses on creative food activities for school-age children that incorporate math and science concepts.

Lesson Objectives
At the completion of the lesson the participant will be able to:

1. Use creative food activities to teach math concepts to school-age children.
2. Use creative food activities to teach science concepts to school-age children.

Get Ready to Train

The format for the CARE Connection lesson plans includes an overview, preparation checklist, lesson-at-a-glance with timeline for conducting the lesson, script, and lists of references and other resources. The instructor will use the script to present the lesson to the participants. Each script gives directions to the instructor—DO, SAY, ASK—to deliver the lesson.

The lesson can be presented in the child care center or family day care home, media center, or classroom.
## Preparation Checklist

**Directions:** Use the Preparation Checklist to get ready for the training session. Keep track of your progress by checking off tasks as they are completed.

<table>
<thead>
<tr>
<th>Done</th>
<th>Lesson Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑</td>
<td><strong>Gather Materials</strong></td>
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<tr>
<td></td>
<td>Materials Needed:</td>
</tr>
<tr>
<td>☐</td>
<td>• Instructor’s Script</td>
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<tr>
<td></td>
<td>• Pictograph Chart</td>
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<tr>
<td></td>
<td>• Pictograph Chart labels</td>
</tr>
<tr>
<td></td>
<td>• Pictograph Fruit, Vegetable, and/or Snack cards</td>
</tr>
<tr>
<td></td>
<td>• Handout 1: <em>Food Activities that Enhance Math and Science Concepts</em></td>
</tr>
<tr>
<td></td>
<td>• Handout 2: <em>Math and Science Food Activities</em></td>
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<tr>
<td></td>
<td>• Spray adhesive or double-sided tape</td>
</tr>
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<td>☐</td>
<td>• Pens or pencils (one for each participant)</td>
</tr>
<tr>
<td>☐</td>
<td>• Session Evaluation/Feedback Form (one for each participant)</td>
</tr>
<tr>
<td></td>
<td><strong>Prepare for Lesson</strong></td>
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<tr>
<td></td>
<td>Before the Training:</td>
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<tr>
<td>☐</td>
<td>• Copy pictograph onto chart paper (see sample). Spray front of chart with adhesive.</td>
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<tr>
<td>☐</td>
<td>• Cut out desired pictograph chart label and place on chart where indicated.</td>
</tr>
<tr>
<td>☐</td>
<td>• Reproduce the pictograph card that corresponds with the selected label (fruit, vegetable, or snack). Food pictures should be small enough to fit on the pictograph chart lines, but large enough to be seen. Cut out food pictures.</td>
</tr>
<tr>
<td>☐</td>
<td>• Make copies of Handouts 1 and 2 (one of each for each participant).</td>
</tr>
<tr>
<td>☐</td>
<td>• Make copies of Session Evaluation/Feedback Form (one for each participant). You may use the sample NFSMI evaluation form or develop your own.</td>
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<tr>
<td></td>
<td><strong>On Training Day:</strong></td>
</tr>
<tr>
<td>☐</td>
<td>• Place pictograph chart on wall.</td>
</tr>
<tr>
<td>Time</td>
<td>Topic</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>1 minute</td>
<td>Introduction and Overview</td>
</tr>
</tbody>
</table>
| 15 minutes | Objectives 1 and 2: Use creative food activities to teach math and science concepts to school-age children. | Participant review and discussion       | • Handout 1: *Food Activities that Enhance Math and Science Concepts*  
• Handout 2: *Math and Science Food Activities* |
| 1 minute   | Summary and Close                                                     | Review Key Points                       | • Script                                                                                           |
| 3 minutes  | Session evaluation/feedback                                          | Conduct a short evaluation of the lesson. | • Sample evaluation/feedback form or standard form used in your nutrition program                   |
References


Internet Resources

Instructor’s Script

SAY:
Nutrition activities can be used to teach math and science concepts to children of all ages. Children can learn to measure, experiment, solve word problems, and complete various other math and science related projects using food.

DO:
Distribute Handout 1: *Food Activities that Enhance Math and Science Concepts*

SAY:
On your handout, you will find math and science concepts for school-age children and ways to incorporate them into nutrition activities.

ASK:
Which of these suggestions sound the most interesting and doable?

DO:
Allow participants to respond or make comments.

ASK:
Can you think of any other developmentally appropriate activities that could be used to teach these math and science concepts?

DO:
Select two or three volunteers to answer. Allow participants to ask questions or make comments.

DO:
Distribute copies of Handout 2: *Math and Science Food Activities*

SAY:
As we look at Handout 2: *Math and Science Food Activities*, you will find additional activities. Let’s do a variation of the Favorite Food Graphing activity.
DO:
Point to the food cut-outs and pictograph chart on the wall.

SAY:
From the food cut-outs, select your favorite food. Graph it by placing the cut-out next to the food’s name on the pictograph.

DO:
Allow participants time to place their cut-outs on the appropriate pictograph line.

ASK:
What does this graph tell us? Which food is liked the most? Which is liked the least? Were there any ties? What other kinds of foods could be graphed?

SAY:
A pictograph is one way to graph the results. On your handout, there is a sample bar graph, which is another way to show the final results. Take a couple of minutes to look at the other activities on Handout 2.

DO:
Encourage participants to ask questions or make comments regarding the activities.

**Review Key Points to Close Lesson**

SAY:
Using creative food activities is a good way to support children in learning about healthy eating choices as well as practicing their math and science skills.

Refer to your handouts for ideas when planning food activities that include math and science concepts.

DO:
Distribute the session evaluation/feedback form and pens or pencils.

SAY:
Thank you for participating in the lesson today. Please take a couple of minutes to complete the session evaluation/feedback form. Thank you for your input.
Food Activities that Enhance Math and Science Concepts
Handout 1

Measurement
- Measure food for recipes using standard and nonstandard measuring tools.
- Estimate which size container is needed to hold food and liquids.
- What are the different ways a rectangular cheese pizza can be cut?

Temperature
- Discuss how temperature affects food in cooking.
- Measure temperature of liquids used in cooking.
- Experiment by changing the temperature of ingredients used in a recipe.

Number operations
- Assist in developing the grocery list by deciding how much of each food is needed to serve everyone equal portions.
- Convert recipes based on the number of servings needed.

Money
- Add up the grocery receipts and determine amount spent per student.
- Given a budget and using grocery ads, create a shopping list.

Patterns
- Create patterns when alternating food items on large serving trays or individual plates.
- Use garnishes to create patterns on food.

Shapes
- Cut foods into geometric shapes.
- Create new shapes using foods, such as marshmallows with toothpicks.
- Sculpt bread dough into various shapes.
Fractions
- When a food is cut in half, fourths, thirds, or eighths, determine how each piece would be written numerically.
- Write the resulting numbers when you add or remove one or more pieces of the same or different size.

Classification/Grouping
- Group food items based on various attributes, including shape, color, size, and texture.

Gathering and interpreting data
- Survey peers on their food choices prior to food preparation and distribution.

Graphing
- Use various types of graphs to represent data.

Chemistry
- Predict what happens when certain liquids and solids are mixed.
- Observe and record the results of chemical reactions when foods are combined and/or cooked by various methods (cause and effect).

Life science (seeds and plants)
- Plant a small outdoor garden of vegetables, or grow them in pots.
- Track plant growth using measuring tools and graphs/charts.
- Learn about and taste the edible parts of plants.
- Compare organic fruits and vegetables versus traditional.

Physical science
- Discuss the properties of solids and liquids and how they are measured.

Senses
- Participate in a taste testing session by comparing the taste of certain foods when using all of the senses, versus tasting the same foods while eyes are closed or while holding the nose.
Problem solving
  • Determine the amount of food needed based on serving size and number of people.

Estimating
  • Guess how many cups of water will fill the beverage container.
  • Guess how many containers will be needed to hold leftovers.
Handout 2 – Math and Science Food-Related Activities

Favorite Fruit Graphing

Large Group Activity:

Math and Science Concepts: graphing, gathering, and interpreting data

Materials Needed
- Four different fruits, sliced or cut into bite-size pieces (enough for each child to have at least one piece of each variety of fruit)
- Large pictograph chart or bar graph chart (see samples below)
- Fruit cutouts representing each fruit variety used (apply double-sided tape on back)
- Napkins
- Fruit dip (optional; recipe follows)

1. After giving a brief description of each fruit, allow students to taste.

2. Allow each student to select the cutout that represents his/her favorite fruit.

3. Students will graph their favorite fruit by placing the corresponding fruit cutout next to the fruit’s name. (You may choose to use a bar graph for older or advanced students.)

4. Possible questions to ask:
   a. What does this graph tell us? (Which fruit is liked the most? Which is liked the least?)
   b. Were there any ties?
   c. What other kinds of foods could be graphed?

6. Offer fruit dip with remaining fruit pieces for a healthy snack.

7. Try using fruits that may be new to students (papaya, kiwi, mango, etc.)

Fruit Dip Recipe:
8 ounces of frozen fat-free whipped topping, thawed
8 ounces of low fat yogurt, any flavor

Thoroughly mix whipped topping and yogurt. Keep refrigerated until served.

Note: Vegetables can be substituted for the fruit and low-fat or fat-free salad dressing for the dip.
### Sample Fruit Pictograph

<table>
<thead>
<tr>
<th>Type of Fruit</th>
<th>Number of Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avocados</td>
<td>![Avocados Pictograph]</td>
</tr>
<tr>
<td>Cherries</td>
<td>![Cherries Pictograph]</td>
</tr>
<tr>
<td>Bananas</td>
<td>![Bananas Pictograph]</td>
</tr>
<tr>
<td>Pineapple</td>
<td>![Pineapple Pictograph]</td>
</tr>
</tbody>
</table>

### Sample Bar Graph

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avocados</td>
<td>3</td>
</tr>
<tr>
<td>Cherries</td>
<td>4</td>
</tr>
<tr>
<td>Bananas</td>
<td>3</td>
</tr>
<tr>
<td>Pineapple</td>
<td>2</td>
</tr>
</tbody>
</table>

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Creative Food Activities for School-Age Children
Handout 2
No More Brown Apples

Small Group Activity:

**Math and Science Concepts: chemistry, problem solving, measuring**

Materials Needed
- Four apples, any variety
- Four clear bowls
- Four apple corers/slicers
- Knife
- Measuring spoons and cup
- Lemon juice
- Ginger ale
- Plastic wrap
- Water
- Salt
- Timer
- Board or chart paper and markers

1. Ask, “Why do you think apples turn brown once you cut them open or bite into them?” Record answers on board or chart paper.

2. Explain that apples turn brown when oxygen, which is in the air we breathe, comes in contact with a natural chemical found in apples.

3. Ask, “What do you think we could do to prevent apples from turning brown?” Write suggestions on the board or chart paper.

4. Explain that we will try several methods in an attempt to keep the apples from turning brown.

5. Divide students into four groups. Have the groups cut their apples into slices using corer/slicers. Assign each group one of the methods below:
   - Method 1 – Lemon Juice
     Place apple slices in bowl. Pour 2 tablespoons of lemon juice over the flesh.
   - Method 2 (will use the apple halves) – Plastic Wrap
     Tear off two sections of plastic wrap and tightly cover each half.
   - Method 3 – Salt Water Solution
     Mix one cup of water and one teaspoon of salt in a bowl. Place sliced apples in salt water solution.
   - Method 4 – Ginger Ale
     Place apple slices in a bowl. Pour enough ginger ale into bowl to cover apple slices. Let soak in ginger ale for 10 minutes.

6. Discuss the results of each method used and encourage students to explain why they believe a particular method worked or did not work.
The instructions below should be distributed to each group.

<table>
<thead>
<tr>
<th>Method 1 – Lemon Juice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place apple slices in bowl. Pour 2 tablespoons of lemon juice over the flesh.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method 2 – Plastic Wrap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tear off two sections of plastic wrap. Tightly cover each apple half with plastic.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method 3 – Salt Water Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mix one cup of water and one teaspoon of salt in a bowl. Place apple slices in salt water solution.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Method 4 – Ginger Ale</th>
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</thead>
<tbody>
<tr>
<td>Place apple slices in a bowl. Pour enough ginger ale into bowl to cover apple slices. Let soak in ginger ale for 10 minutes.</td>
</tr>
</tbody>
</table>
Individual Pizza Pies

Small Group Activity:

Math and Science Concepts: fractions, geometry (shapes), temperature

Materials Needed
- 7-inch whole-grain pizza crusts (one per child)
- Shredded low-fat cheese (Mozzarella, Parmesan, Feta, Cheddar)
- Pasta or pizza sauce
- Toppings (healthy suggestions: mushroom slices, diced tomatoes, onions, pineapple chunks, green peppers, olives)
- Bowls and tablespoons (one for each cheese and topping)
- Plastic knives (for spreading sauce)
- Nonstick baking sheets

1. On one table, set up an assembly line in this order: plates, pizza crusts, sauce. Place bowls of cheese and toppings on each of the children’s tables (one bowl of each per four to five children).

2. Instruct children to choose a plate, pizza crust, and enough sauce to cover the surface. Once they return to their seat, instruct them to spread the sauce evenly on the crust and top their pizzas with preferred toppings. Allow children to use their creativity in designing their pizzas.

3. Place individual pizzas on baking sheets. Bake in a preheated 350 degree oven for 14-18 minutes.

4. Remove from oven. Allow to cool slightly before serving each child the pizza he or she created.

5. Explain that one pizza equals one whole. As you model, have students cut their pizzas in half. Ask the following questions:
   a. How many pieces do you have now? (2)
   b. What is each piece called? (A half)
   c. How many ½’s equal a whole? (2)
   Repeat the same questions after students cut their pizzas in fourths and eighths. Have children identify the original shape and the shapes that result once the pizza is cut into slices.

6. Let students enjoy their healthy creations!

Other Suggestions:
- Large whole-wheat refrigerator biscuits (one biscuit for every two children) can replace the pre-made pizza crust. Using fingers, model for students how to spread the biscuit dough out into a five- or six-inch circle (does not have to be perfectly round). Bake in a preheated 350 degree oven for 6-8 minutes or until top is medium brown. Top with sauce and desired toppings. Bake for 5 additional minutes, or until cheese melts.
- Use refrigerated pizza dough. Roll out dough on a lightly floured surface. Using a six-inch round cutter, allow each child to cut out his/her own pizza circle.
• Cut refrigerated pizza dough into six-inch squares, instead of circles.
• Whole grain English muffins can be substituted for pizza dough.
• Fruit pizzas – Bake rolled-out refrigerator biscuits according to time and temperature above, prior to applying toppings. Allow to cool slightly. Replace the pizza sauce with 1 to 2 tablespoons softened, light or fat-free cream cheese or Greek yogurt. Offer sliced or chopped fresh fruits for the toppings.
• Tortilla pizzas – Place a paper towel on a microwave-safe plate. Put an 8” or 10” flour tortilla on top of paper towel. Microwave on high for 1 ½ to 2 minutes, until tortilla surface becomes dry and puffy, turning once halfway through. Remove from microwave. Top with shredded cheese and toppings. Microwave on high for 45 seconds to 1 ½ minutes or until cheese melts, turning once halfway through cooking.

Vegetable Kabobs

Child Directed Activity

Math Concept: patterning

Materials Needed:
• Wooden skewers (at least one for each student)
• Variety of vegetables that can be eaten raw, cut into bite-size pieces*
• Paper plates

Display a tray of the raw vegetables and skewers. Students can create patterns as they thread the vegetables on the skewers. Allow students to eat their healthy creations.

*Possible vegetables:
• Cherry tomatoes
• Zucchini
• Yellow squash
• Sweet yellow, red, orange, and green peppers
• Mushrooms
• Celery

Note – Fruits can be substituted for the vegetables. Low fat cheese cubes can also be added to fruit and vegetable kabobs.
<table>
<thead>
<tr>
<th>Pictograph Chart Labels</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FRUITS</strong></td>
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<tr>
<td><strong>VEGETABLES</strong></td>
</tr>
<tr>
<td><strong>SNACKS</strong></td>
</tr>
</tbody>
</table>
(Place label here)  Pictograph

<table>
<thead>
<tr>
<th>Food</th>
<th>Number of Votes</th>
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<tr>
<td>Fruit</td>
<td>Image 1</td>
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</tr>
<tr>
<td>Strawberries</td>
<td><img src="Image1" alt="Strawberries" /></td>
</tr>
<tr>
<td>Kiwi</td>
<td><img src="Image1" alt="Kiwi" /></td>
</tr>
<tr>
<td>Cantaloupe</td>
<td><img src="Image1" alt="Cantaloupe" /></td>
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<tr>
<td>Grapes</td>
<td><img src="Image1" alt="Grapes" /></td>
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<tr>
<td>Blueberries</td>
<td><img src="Image1" alt="Blueberries" /></td>
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<tr>
<td>Plums</td>
<td><img src="Image1" alt="Plums" /></td>
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<tr>
<td></td>
<td>Nuts</td>
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<tr>
<td>Popcorn</td>
<td>Popcorn</td>
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<tr>
<td>Raisins</td>
<td>Raisins</td>
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<td>Grapes</td>
<td>Grapes</td>
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<tr>
<td>Graham Crackers</td>
<td>Graham Crackers</td>
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<tr>
<td>Apples</td>
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<tr>
<td>Vegetable</td>
<td>Image 1</td>
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</tr>
<tr>
<td>Corn</td>
<td>![Corn Image]</td>
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