4-H Exploring Food Science

North Dakota 4-H Project Sheet

Healthy Lifestyle Education

4-H exploring food science projects are designed to help you complete hands-on experiments, prepare a variety of fun recipes, and enjoy learning about food ingredients, characteristics and safety.

- Learn about safe, healthful food preparation.
- Understand the functions of ingredients in different foods.
- Learn how food science principles play a role in food processing.
- Understand the chemical and physical reactions that occur in food.
- Demonstrate skills in following written and verbal instructions.

Here’s what you can do all year!

<table>
<thead>
<tr>
<th>Unit 1: The Secrets of Baking</th>
<th>Unit 2: The Power of Protein Chemistry</th>
<th>Unit 3: The Inner Mysteries of Fruits and Vegetables</th>
<th>Unit 4: Be a Food Scientist!</th>
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<tr>
<td>Learn how to measure ingredients.</td>
<td>Identify parts of an egg.</td>
<td>Conduct food science experiments.</td>
<td>Explore food science careers.</td>
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<td>Learn about gluten development in baked goods.</td>
<td>Learn about protein coagulation in recipes.</td>
<td>Demonstrate your knowledge of osmosis and diffusion in food preparation.</td>
<td>Understand the difference between food science and food technology.</td>
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<td>Learn how leavening agents affect foods.</td>
<td>Understand food safety principles applied to eggs.</td>
<td>Compare the nutrient content of fresh, frozen and canned vegetables.</td>
<td>Learn about flavor principles.</td>
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<td>Conduct fun food experiments.</td>
<td>Learn about egg properties and functions in foods.</td>
<td>Learn to cook fruit.</td>
<td>Learn how to make a beverage.</td>
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<td>Understand ingredient ratios in batter and dough mixtures.</td>
<td>Learn how to fold egg whites into a mixture.</td>
<td>Prepare cut produce to delay browning.</td>
<td>Understand how to make smart beverage choices.</td>
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<td>Explore mixing methods.</td>
<td>Make fresh cheese using principles of acid and enzyme coagulation.</td>
<td>Prepare fresh cheese using principles of acid and enzyme coagulation.</td>
<td>Learn about crystallization and caramelization.</td>
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Pass it on! Now that you know how, share it with others. Here are ideas to get you started.

Citizenship
- Make homemade muffins using your new knowledge of leavening agents and mixing methods. Share them with older adults at a care center.
- Sell healthful foods and donate the funds to a worthy cause.

Leadership
- Take responsibility for preparing cut produce to delay or prevent browning at home.
- Plan and help prepare soft and hard candies for dessert for a family meal.

Communication
- Teach your family how to prepare vegetables in a way that retains nutrients and visual appeal.
- Design a poster about food science careers.
- Teach your friends how to fold egg whites or whipped cream into a mixture.

Entrepreneurship
- Create your own beverage. Name and market your new product.

Learn more at www.ndsu.edu/4h/ or contact your county NDSU Extension office.
Here are Other Opportunities for Exploring Food Science:

- Research Dairy Science degrees and learn about what dairy scientists do.
- Explore careers in science, engineering or technology.
- Bring to the fair an exhibit (or piece of your project) that shows what you learned about food science.
- Experiment with making different foods that contain gluten.
- Meet others interested in food and food science.
- Research a professional food science organization to learn more about what its members do.
- Contact a food scientist, food chemist, food safety inspector or registered dietitian and ask if you can visit with him or her about his or her job.
- Consider taking more science classes when in high school.
- Think about what foods and beverages are most popular with your friends and family. Contemplate why these products are more popular than other products (for example: marketing, taste, nutrition).
- Attend the 4-H Youth Conference to hear motivational speakers and participate in workshops and a community service project. Bring ideas back to your community.
- Hold a food contest with friends; decide how a winner will be chosen, and evaluate the products you create.

**Exhibit Ideas**

- Make a portfolio or display on egg components, properties and/or functions in foods.
- Make a portfolio or display on fruits that are prone to browning, vegetables that cook well or the nutrient content of different fruits and vegetables.
- Prepare muffins, quick breads, popovers, biscuits, cookies or a beverage.

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<tr>
<th>4-H Resources</th>
<th>Other Resources</th>
<th>Recordkeeping</th>
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<tr>
<td>What’s on Your Plate? Exploring Food Science <a href="http://4-h.org/parents/curriculum/food-science/">Link</a></td>
<td>Eat Smart. Play Hard. Together <a href="www.ag.ndsu.edu/eatsmart/">Link</a></td>
<td>Planning for My Project Adventure <a href="#">Link</a></td>
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<tr>
<td>After Dinner Science <a href="http://4h.missouri.edu/projects/ggprojects/docs/afterdinnerscience.pdf">Link</a></td>
<td>MyPlate (U.S. Dept. of Agriculture) <a href="www.choosemyplate.gov">Link</a></td>
<td>ND 4-H Project Plan <a href="#">Link</a></td>
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<td>Wacky World of Edible Science <a href="http://4h.missouri.edu/projects/ggprojects/docs/Wacky&amp;EdibleScienceGuide.pdf">Link</a></td>
<td>Kids a Cookin’ - Kansas State Research and Extension <a href="www.kidsacookin.org/">Link</a></td>
<td>ND 4-H Plan of Action <a href="#">Link</a></td>
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<td>Steve Spangler—Food Science <a href="http://www.stevespanglerscience.com/lab/experiments/category/food-science">Link</a></td>
<td>Picture-based Recipes <a href="www.ag.ndsu.edu/globalfood/picture_recipes.html">Link</a></td>
<td>ND 4-H Participation Summary for 11- to 19-year-olds <a href="#">Link</a></td>
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