

Lesson: Food Structure in Science

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Suggested Time: 50 Minutes

Overview

Students will learn the science and problem-solving methods that are applied to food, as small teams, then as a team of ‘Chef’s’.

Vocabulary

- Sauté
- Bake
- Fry
- Steam
- Boil
- Protein-Structure
- Measure
- Grams
- Ounces
- Gallons
- Conversions
- Cook
- Chef
- Temperature
- Food Safety Standards
- Blanched

Objectives

- Students will learn together about how the structures of proteins, fats, and carbs change as you use heat.
- Students will learn more about feeding themselves and how they can make sure they are being cautious.
- Students will use learned math skills to make conversions to follow recipes correctly.

Required Project Materials

Food Related Materials: Chicken, Sauté pan, Gas Mini Burner, Vegetable oil, Measuring Cups, Plates, food safe gloves, Spatula, tongs, and Microscope.

Multimedia

- Kitchen Measurement Conversion Chart <https://www.amazon.com/dp/B07RM26N4V>
- Introduction to Proteins: Structure, Function, and Motion, Second Edition (Chapman &

Hall/CRC Computational Biology Series) 2nd Edition <https://www.amazon.com/Introduction-Proteins-Structure-Mathematical-Computational/dp/1498747175>

- Student Lab Resources & Study Guide for Introduction to Culinary Arts 2nd Edition <https://www.amazon.com/Student-Resources-Study-Introduction-Culinary/dp/013273821>

Optional Multimedia Resources

Video on food safety standards <https://www.youtube.com/watch?v=KBvU4Bmu5O0>

Before the Lesson/ Background Information

- Have a cooked vs non cooked chicken breast ready to demonstrate to class the difference in the way it feels / looks.
- Have cooked broccoli vs raw broccoli.
- Assemble a plate that looks presentable.
- Lay flour out in $1/4c$, $1/2c$, $1/3c$, $3/4c$, $1c$ to demonstrate the difference in sizes.

The Lesson

Part 1: Small Group Studies (15 mins)

1. Using the vocabulary and knowledge outlined the class will separate into groups of fours and use the microscope to look at the difference of structures between cooked chicken and raw chicken.
2. Using the materials provided teams will form a hypothesis about what may happen if the raw meat is frozen instead of heated.
3. Let them know that we will talk about the hypothesis as a class and why the students think what may happen. This is free thinking so there will not be many criteria to grade.
4. Then we will talk about the difference in the frozen meat vs. the cooked meat and why its changed.

Part 2: Team Chef (25 Mins)

1. This time students will use the burner to properly cook the meat and broccoli.
2. Have the students discuss if their hypothesis was correct or incorrect and why.
3. When the food is prepared have the student show their skills in presentation.
4. What else can the students do with the newly cooked food now that the structure of the meat has changed? What else can you relate this to?

Part 3: Discussion

1. Discuss if the students followed the recipes and why they may have different results and why.
2. Was their hypothesis correct or incorrect?
3. Why is science so important in cooking?
4. Why is math so important in cooking?
5. Did using the microscope help you understand what was happening to the proteins?
6. How many ounces are in a cup? Is it always exact?

***Homework: The students will use their math skills to change cups to ounces and ounces to cups on a worksheet. These will be turned in next class period.**