

ORANGE BRAISED

CHARD

GRADE: 5th

LENGTH: 45 minutes

Essential Question

How does cooking affect the flavor, texture and appearance of vegetables?

Alabama Curriculum Standards

Sci 5.4.2 Compare and contrast physical and chemical changes.

Recipe

Ingredients:

- 2 bunches chard (or other leafy greens)
- 1 yellow onion
- 2 oranges, juiced
- 4 Tbsp. olive oil
- Salt and pepper, to taste

Directions:

1. Strip the chard leaves from their stems and cut or tear the leaves into bite-size pieces.
2. Peel and thinly slice the onion.
3. Juice the oranges and set aside for later.
4. Heat oil in a skillet over medium-high heat.
5. Add onions, salt and pepper. Cook until golden brown.
6. Add the chard and orange juice. Toss and cook for about 3 minutes.
7. Serve and enjoy!

Preparation

Acquire all lesson materials. Photocopy recipe cards. Set up cooking area inside or outside. Set up a wash station, if harvesting veggies during the lesson. Recruit an extra adult or two for help before, during, and/or after the lesson. Review basic food safety. Watch our YouTube video [Cooking in the Classroom](#). Have students wash their hands with warm soapy water before class begins.

Objectives

- To use produce in the garden to make a healthy dish.
- To learn basic food preparation skills.
- To explain heat transfer and physical change.

Materials

- Recipe cards
- Cutting boards
- Kid-safe knives
- Juicer
- Measuring spoons
- Hot plate
- Large skillet
- Large spoon or spatula
- Tongs
- Serving plates and forks
- "Orange Braised Chard" worksheet (optional)

Vocabulary

- physical change
- chemical change
 - caramelize
 - braise

Opening Circle

- Tell students that they will be making Orange Braised Chard from ingredients grown in the school garden. Review the recipe as a class, pointing out the different sections: ingredients and cooking directions. Explain to students that they will be following the recipe while also determining if each ingredient undergoes a **physical** or **chemical** change.
- Review with students physical versus chemical changes. (*See Teacher Background.*)
- Ask students to think of an example of a physical change and share it with their neighbor.
- Ask students to think of an example of a chemical change and share it with their neighbor.
- Ask students if the below examples are physical or chemical changes and how they know:
 - Slicing an apple (*physical*)
 - Melting ice into water (*physical*)
 - Frying an egg (*chemical*)
 - Baking a cake (*chemical*)
- Explain to students that there will be many steps to preparing our recipe, and everyone may not have the same job, but if we work together, we will be able to enjoy a snack together.

Activity

PART 1: HARVEST AND WASH

- 1 Lead students to the garden to harvest chard.
- 2 Lead students to the washing station to wash their vegetables.
- 3 Collect all the washed vegetables and return to cooking area.

PART 2: PREPARING THE RECIPE

- 4 Pass out a small piece of raw chard to each student to taste. Ask students to describe the appearance, smell, and taste of the raw chard. Is tearing the chard into small pieces an example of a physical or chemical change? (*Physical*)
- 5 Complete the steps of the recipe, calling on students as needed. (*See Teacher Background for an example of how students may participate.*)
 - While cooking the onions, explain to students that to **caramelize** something means to cook it slowly until it is brown and sweet.
 - As onions are caramelizing, have students discuss their observations of the raw chard or record them on the *Orange Braised Chard* worksheet. Before adding chard, have students discuss or write a hypothesis on how the chard will change (appearance, smell, and taste) once it is cooked.
 - Explain to students that we are **braising** the chard, meaning we are first cooking it on high heat to brown it with the fat from the oil and then we will simmer it in the orange juice.

PART 3: TASTING

- 6 Remind students to be respectful and curious when tasting. (*See the Cooking Promise in Chapter 1 for more ideas on how to encourage students to try new foods.*)
- 7 Serve everyone a sample. While waiting for everyone to be served, ask students to describe the appearance, and smell of the cooked chard. What type of change occurred? (*Chemical*)
- 8 Taste and enjoy!

Closing Circle

Have students complete the worksheet, if applicable, and share their thoughts about cooking the chard:

- What physical changes did we observe? Chemical changes? How did you know the difference?
- Did the chard taste better raw or cooked?
- What were some new cooking terms that they learned? (*Caramelize, braising, simmer*)
- What was the most challenging part about preparing the chard?
- Would you try this recipe at home? Would you modify it in any way?

Extensions

- 1 Have students write a video script for a cooking demo of the recipe. Film the students cooking the chard and reviewing proper cooking techniques.
- 2 Have students find a recipe that demonstrates only physical changes, not any chemical changes.

teacher

BACKGROUND

HARVESTING

For specific information on when and how to harvest and wash each vegetable included in this recipe, see the Appendix.

PHYSICAL VS. CHEMICAL CHANGE

In a **physical change**, there is a difference in the appearance of matter without a change in composition. When the chard is cut, it is in smaller pieces but nothing about its composition changes therefore it is a physical change.

In a **chemical change**, there is an irreversible change in the composition of the substances in question. When the chard is heated and mixed with other ingredients, we see steam coming up from the pan and the chard begins to wilt. This is because the cell walls are being broken down, causing the chard to lose its rigid structure. Water escaping from the cells begins to evaporate causing steam to form. The change in the color of the leaf as it cooks is also a sign the chemical changes are occurring.

MAKING THE ORANGE BRAISED CHARD

Engaging students:

- Have several students strip the stems from the chard leaf and cut the leaves into bite-size pieces.
- Have 4 students each thinly slice one quarter of the onion.
Tip: Guide students to lay the onion flat on their cutting board for easier control while slicing.
- Have 2-4 students slice the oranges in half and juice them.
- Have a couple students carefully add the olive oil and sliced onions to the pan.
- When the onions are golden-brown and caramelized, have one student carefully add the chard leaves.
- Have one student carefully add the juice from the oranges.
- Have 1-2 students add salt and pepper.
- Have a couple students help serve.

DISCUSSION IDEAS

For more discussion questions to ask students throughout the lesson or to use as a writing prompt see page 83.

CHEMICAL VS. PHYSICAL CHANGES

Essential Question:

How does cooking affect the flavor, texture and appearance of vegetables?

Our Cooking Experiment	
<u>Observations</u> What is the color, texture, and flavor of the <u>raw</u> chard?	
<u>Hypothesis</u> How will the chard change once it is cooked?	
<u>Result</u> What is the color, texture, and flavor of the <u>cooked</u> chard?	

Conclusions:

1. Did the chard change once it was cooked? How can you tell?

2. What do you think caused the changes?

BONUS: Write about a physical or chemical change you notice happening around you right now. Use details to describe the change. Be sure to state which kind of change is occurring: physical or chemical.

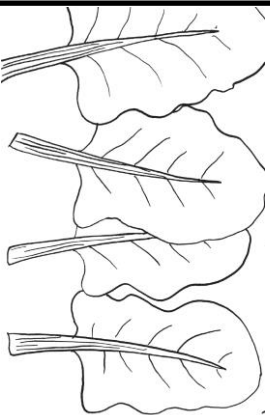
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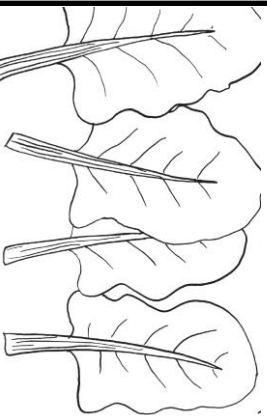
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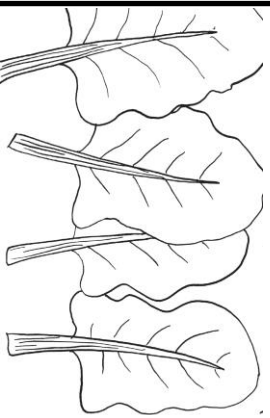
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