

HEARTY GREENS

SALAD

GRADE: 5th

LENGTH: 45 minutes

Essential Question

How do the physical properties of foods affect how we choose to cook them?

Alabama Curriculum Standards

Sci 5.3 Examine matter through observations and measurements to identify materials based on their properties.

Recipe

Ingredients for salad:

- 2 bunches hearty greens, such as kale, collards or mustards
- ½ lemon, juiced
- Pinch of salt
- Optional toppings: chopped apples, parmesan cheese, sunflowers, etc.

Ingredients for dressing:

- 2 Tbsp. extra virgin olive oil
- ⅓ cup balsamic vinegar
- ½ lemon, juiced
- 1 Tbsp. honey
- 2 Tbsp. Dijon mustard
- 2 tsp. garlic, minced
- Salt and pepper, to taste

Directions:

1. Strip green leaves from their stems. Cut or tear them into bite-sized pieces.
2. Add the greens to a large bowl. Add the juice of ½ a lemon and a pinch of salt.
3. Wearing food safe gloves, massage leaves until dark green and wilted.
4. Add dressing ingredients to a jar, screw lid on tightly, and shake to combine.
5. Add dressing to greens and toss to coat.
6. Add toppings such as chopped apples, grated parmesan cheese, and sunflower seeds. Serve and enjoy!

Objectives

- To use produce in the garden to make a healthy dish.
- To learn basic food preparation skills.
- To describe physical properties of ingredients.

Materials

- Recipe cards
- Cutting boards
- Kid-safe knives
- Large mixing bowl
- Juicer
- Food safe gloves
- Jar with lid
- Measuring spoons
- Measuring cups
- Tongs
- Serving plates and forks
- Box grater (optional)

Vocabulary

- physical properties
- insoluble • soluble
- emulsifier

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.

Opening Circle

- Tell students that they will be making a hearty greens salad 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 observing the **physical properties** of each ingredient.
- Remind students that physical properties can be observed without changing the matter's composition. Ask students:
 - What are some ways that you can distinguish different substances from each other? For example, what is the difference between sand and sugar?
- 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 the hearty greens.
- 2 Lead students to the washing station to wash their vegetables.
- 3 Collect all washed vegetables and return to cooking area.

PART 2: PREPARING THE RECIPE

- 4 Pass out the hearty greens. Ask students to describe the appearance, smell and texture of the greens.
- 5 Complete the steps of the recipe, calling on students as needed. (*See Teacher Background for an example of how students may participate.*)
- 6 Ask students to make observations of the physical properties of the ingredients as they are added to the dish.
 - After combining the oil and vinegar, ask students how many layers are visible. Why? (*Two separate layers. Oil is insoluble in vinegar.*) Review the terms **insoluble** and **soluble**. (*See Teacher Background.*)
 - After mixing in the lemon juice, allow the ingredients to sit for a moment. Ask students how many layers are visible. (*Two separate layers. Lemon juice is soluble in vinegar.*)
 - As the mustard is added, explain to students that mustard is an **emulsifier** - a substance that combines two ingredients together that do not ordinarily mix easily. Shake to mix the ingredients then ask students how many layers are visible. (*One layer. All ingredients have mixed together.*)

PART 3: TASTING

- 7 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.*)
- 8 Serve everyone a sample.
- 9 Taste and enjoy!

Closing Circle

Have students reflect on what they learned and share their thoughts about cooking with produce from the garden.

- What physical properties did we observe?
- Which ingredient was soluble? Insoluble? Which ingredient was the emulsifier?
- What was most challenging part about preparing the salad?
- Would you try this recipe at home? Would you modify it in any way?

Extensions

- 1 Experiment with other emulsifiers, such as ketchup or miso to see which works the best with oil and vinegar. Create a salad dressing recipe using a different emulsifier.
- 2 Practice writing the “instruction” component of simple garden recipes! Prepare a dish in class. Have students watch, then challenge them to write instructions on how to make it based on your demonstration.

teacher

BACKGROUND

HARVESTING

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

MAKING THE HEARTY GREENS SALAD

Engaging students:

- Have several students strip the stems from the greens and cut the greens into bite-size pieces.
- Have a few students slice the lemon in half, juice them and set aside.
- Have a couple students add the lemon juice to the greens and massage the leaves wearing food safe gloves.
- Have a few students measure and add the ingredients of the dressing.
- Pass the jar around and have every student shake it to help mix the dressing.
- Have one student add the dressing to the greens.
- Have 1-2 students toss the salad.
- Have a couple students help serve.

PHYSICAL PROPERTIES

Physical properties are used to observe and describe matter. Physical properties can be observed or measured without changing the composition of matter. These are properties such as color, taste, odor, texture, mass, weight, volume, and density. The relative densities of oil, vinegar, and honey can be observed when mixing the dressing. Honey sinks to the bottom and is, therefore, denser than the other two ingredients.

Solubility means a solvent, often water, has the ability to dissolve another substance called a solute, such as sugar for instance. Miscibility refers to the ability of a liquid solute to dissolve in a liquid solvent. Miscible liquids are liquids that can mix to form a homogeneous solution, as with vinegar and lemon juice. **Insoluble** substances do not dissolve or mix easily, as with the oil and vinegar.

When you shake the dressing, the oil particles become dispersed throughout the mixture but will quickly separate when you stop shaking. **Emulsifiers** can help make the suspension stable as they keep the oil particles dispersed throughout the liquid. Emulsifiers are particles where one end is attracted to water and the other end is drawn to oil. Common emulsifiers include egg yolks (in which the protein lecithin is the emulsifier), butter (the protein casein is what makes it work), cheese, mustard, honey, tomato paste, ketchup, miso, and garlic paste.

DISCUSSION IDEAS

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

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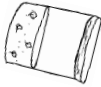
Dressing Ingredients:

- 2 Tbsp extra virgin olive oil
- ¼ cup balsamic vinegar
- ½ lemon, juiced
- 1 Tbsp. honey
- 2 Tbsp. Dijon mustard
- 2 tsp. garlic, minced
- Salt and pepper, to taste



Directions:

1. Strip kale leaves from their stems. Cut or tear them into bite-sized pieces.
2. Add the kale to a large bowl with. Add juice from ½ a lemon and a pinch of salt.
3. Massage leaves until dark green and wilted.
4. Add dressing ingredients to a jar, screw lid on tightly, and shake to combine.
5. Add dressing to kale and toss to coat.
6. Add toppings such as chopped apples, grated parmesan cheese, and sunflower seeds.
7. Serve and enjoy!

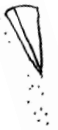
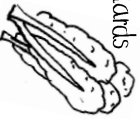


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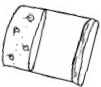
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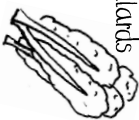


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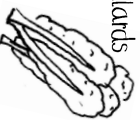


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