

GROW YOUR PALS PROGRAM GUIDE



THE NATIONAL FFA MENTORING PROGRAM

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LESSON 39

Searching for Vitamin C

Unit:
FOOD SCIENCE

PRECEPTS

- J. Mental Growth
- J4. Solve problems.

NATIONAL STANDARDS

NS.K-4.2 Physical Science



Lesson Type:
Large Group

STUDENT LEARNING OBJECTIVES

As a result of this lesson, the student will ...

1. Define indicator.
2. Test and rank food samples from the highest to lowest vitamin C content.





TIME

Instruction time for this lesson: **45-50 minutes.**



RESOURCES

None



TOOLS, EQUIPMENT AND SUPPLIES

- ✓ **thermometer**
- ✓ **cornstarch**
- ✓ **1 tablespoon measure**
- ✓ **water**
- ✓ **science lab beaker** (with 250 milliliter and 75 milliliter markings or kitchen liquid measuring cup(s) with metric markings)
- ✓ **container and Bunsen burner** (or small pan and stove)
- ✓ **small pan or bowl**
- ✓ **eyedropper**
- ✓ **2 percent iodine solution** (available at a pharmacy)
- ✓ **5 (¼ -cup) samples of fruit juices and drinks to be tested**
(Quantity can change if you use fewer juices.)
- ✓ **15-milliliter test tubes** (5 of them and a rack or 5 small, equal-sized glass containers)
- ✓ **paper**
- ✓ **writing utensils**

KEY TERMS



Key Terms

The following term is presented in this lesson and appears in ***bold italics***:

indicator

INTEREST APPROACH

Hold up the thermometer and ask the following question. Then allow for discussion on the purpose of a thermometer.



What is this? That's right, it's a thermometer. What is it used for?

Write answers on the board or just discuss the ideas.



Great job! Thermometers tell us how hot or cold something is. Today we are going to measure and compare some juice samples.

SUMMARY OF CONTENT AND TEACHING STRATEGIES

OBJECTIVE 1. | Define Indicator.



Now let's define **indicator**. What is an **indicator**? *Take a few moments to discuss with the class what they think indicators are, and then give the definition. Great!*

Here is how we define **indicator**.

Indicator-A substance that changes one of its characteristics (usually color) to reveal the presence, absence or concentration of another substance.

Write the definition on the board and then have students copy it.



Today we are going to use a solution of water, cornstarch and iodine to see the presence of vitamin C in juices.

Why is vitamin C important? *Vitamin C is important in the production of collagen, which in return is an important structural element in blood vessel walls, gums and bones*



Sounds exciting, doesn't it? Let's get started.

OBJECTIVE 2. | Test and rank food samples from the highest to lowest vitamin C content.



Have the materials and supplies laid out on the table prior to beginning the lesson. Review the materials then allow students to begin the experiment.



What materials do you see here on the table? *Review the materials aloud.*

Who will help with today's experiment? *Choose a volunteer to measure 250 milliliters of water and one tablespoon of cornstarch, but don't mix them yet.* Thank you. We are now going to make our indicator solution from water and cornstarch. Please measure one tablespoon of cornstarch and 250 milliliters of water. Place the cornstarch in the small bowl or container provided, and then slowly add just enough water to make a paste. Now add the 250 milliliters of water. Stir and place the mixture on the stove (or Bunsen burner) and boil for five minutes. *Have the students watch and anticipate what will happen to the mixture.*

What is happening? What will we see next in the experiment? *This is just a review to make sure the students are still with you and understand what has happened.*

My next volunteer will measure 75 milliliters of fresh water and, using the eyedropper, will add 10 drops of the cornstarch solution. Great, now we are going to add the enough iodine to make the mixture a purplish-blue color. Good job! We have just created our indicator solution. We will use this solution to test the vitamin C in the juices.

Just as we are going to use this indicator solution to test the juices, what are some indicators of how we feel in our lives? *Brainstorm and discuss the various things that indicate happiness, success, sadness, etc.* How can we use these indicators to make right decisions for our lives? *Discuss the answers.*

Ask for another volunteer to complete the next step.



Test the juices using the indicator solution. Let's measure five milliliters or one teaspoon of indicator solution into a 15-milliliter test tube or small glass container. Before we begin, which juice do you think will have the most vitamin C? *Prepare one test tube or container for each juice you want to test.*

Have the PALS or student clean the eyedropper in clean water.



Good job, thanks! Now let's add 10 drops of juice to the corresponding tube. *Use a different test tube for each juice.*



Let's take a look at the colors by arranging the tubes from lightest to darkest. As we arrange them, notice the lighter the solution the more Vitamin C. Why is that the case? *Discuss*. The vitamin C interacts with the indicator solution and causes it to lose its color.



Let's take a look at our results. When I say the word GO, on a piece of paper you and a partner will create a colored chart of the information we have found with the test. Questions? GO!

Work with the partners to create their charts or graphs of the information.



REVIEW / SUMMARY / EVALUATION

Use the Eyewitness-News Moment to review today's activities.

APPLICATION



Small Group Suggestion: *Use the same experiment, except just set up small stations for the groups to complete, or have the test tubes completed then chart and discuss the information.*



One-on-One Session: *Talk with your PALS about the ways and reasons agriculturalists test foods.*