

# VITAMINS & IMMUNITY



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# *Vitamins and Immunity*

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## **Class Overview:**

- **Duration:** 60 minutes
- **Age Group:** Kindergarten to 5th grade

## **Background Information:**

Vitamins are essential nutrients that our bodies need in small amounts to function properly. They play crucial roles in various bodily functions, including metabolism, growth, and maintaining overall health. While our bodies can produce some vitamins, others must be obtained from the foods we eat.

Our immune system is a complex network of cells, tissues, and organs that work together to defend our bodies against harmful pathogens, such as bacteria, viruses, and fungi. A well-functioning immune system is essential for protecting us from infections and maintaining overall health.

Vitamins and the immune system are closely interconnected. Certain vitamins, such as vitamin C, vitamin D, and vitamin E, play important roles in supporting immune function. They help to strengthen our immune response, promote the production of immune cells, and protect against oxidative stress caused by harmful molecules called free radicals.

In this class, we will explore the relationship between vitamins and immunity, learning how different vitamins support our immune system and how we can incorporate them into our diets to stay healthy.

## **Introduction to Lesson 1: Understanding Vitamins**

**Lesson Objective:** Students will analyze vitamins and understand their importance for overall health.

Welcome, young scientists! Today, we're embarking on an exciting journey to explore the fascinating world of vitamins. Have you ever wondered why fruits and vegetables are so important for our health? Well, it's because they're packed with essential vitamins that our bodies need to stay strong and healthy! In our first lesson, we'll dive deep into the world of vitamins, learning about different types of vitamins, where we can find them, and why they're so important for our bodies. Get ready to become vitamin experts!

Have you ever been told to eat certain foods to stay healthy? Let's think about that for a moment. Why do you think we're encouraged to eat fruits, vegetables, and other nutritious foods? Well, today, we're going to explore the world of vitamins and why they're so important for our health.

Now, let's dive into our lesson on vitamins!

- We all know that vitamins are important, but what exactly are they? Vitamins are like tiny helpers that our bodies need to stay strong and healthy. They help us grow, keep our bones and muscles healthy, and even help us fight off germs!
- Vitamins come from different foods. For example, vitamin C is found in oranges, and vitamin A is in carrots.

**Guided Practice:** Students will analyze vitamins and understand their importance for overall health. *Chef Cookie and the Vitamin Family*

- Let's sort food items into categories based on the vitamins they contain.

**Class Discussion:** Before we wrap up, here are some questions for you to answer on your own:

1. **Why are vitamins important in our diet?** Vitamins are like tiny helpers that our bodies need to grow, stay strong, and fight off germs. They help us have energy, keep our bones and muscles healthy, and make sure our bodies work the way they should.
2. **Can you name three fruits and their corresponding vitamins?** Sure! Let's think about it. How about oranges? They're rich in vitamin C. Apples have vitamin A, and bananas have potassium, which is good for us too!
3. **Which vitamin helps in maintaining healthy eyesight?** That's a great question! Vitamin A is the one that helps us see well, especially in the dark. It's like a superhero in our eyes!
4. **True or False: Can vitamins replace the need for a balanced diet?** That's false! Vitamins are super important, but we need to eat lots of different foods to get all the vitamins our bodies need. Eating a variety of healthy foods is the best way to stay strong and healthy.
5. **Explain what 'vitamin deficiency' means in your own words.** Vitamin deficiency is when our bodies don't get enough of a certain vitamin. It's like missing an important part of our diet, and it can make us feel sick or not as strong as we should be.

6. List three consequences of not consuming enough vitamins. If we don't get enough vitamins, we might feel tired a lot, get sick more often, and our bodies might not grow as strong and healthy as they should.
7. Compare and contrast fat-soluble vitamins vs. water-soluble vitamins. Fat-soluble vitamins, like vitamin A, D, E, and K, dissolve in fat and can be stored in our bodies. Water-soluble vitamins, like vitamin C and the B vitamins, dissolve in water and are not stored in our bodies, so we need to eat them every day.
8. Describe how vitamins are different from minerals. Vitamins are like helpers that our bodies need in small amounts to stay healthy, while minerals are also important for our bodies but are found in rocks, soil, and water. They both help us stay strong and healthy in different ways.

### **Experiment Title: Testing Vitamin C Levels in Fruit Juices**

But did you know that not all foods have the same vitamins? That's why it's important to eat a variety of foods to get all the vitamins our bodies need.

**Objective:** To compare the amounts of vitamin C in different fruit juices using a basic test involving iodine solution and starch.

**How the Test Works:** The test involves reacting the vitamin C compound, ascorbic acid, with iodine. The reaction produces dehydroascorbic acid, iodide ions, and hydrogen ions. Initially, iodine appears brown in solution, but when it reacts with ascorbic acid, it forms a blue-black complex with starch. The endpoint of the reaction is reached when all the iodine has reacted with ascorbic acid, resulting in the disappearance of the blue-black color.

### **Materials Needed:**

- Vitamin C solution (10 cm<sup>3</sup>)
- Iodine solution (1 drop per test)
- Starch solution (10 cm<sup>3</sup>)
- Water (50 cm<sup>3</sup>)
- Fruit juices to test (have packaging available)
- Droppers or plastic pipettes
- Test-tubes
- Test-tube rack

- White paper or card for background
- Eye protection

**Procedure:**

1. Put 1 cm<sup>3</sup> of starch solution in a test-tube.
2. Add 5 cm<sup>3</sup> of water and mix gently.
3. Add 1 drop of iodine solution, observing the blue-black color.
4. Place a white paper behind the test-tube for better visibility.
5. Add vitamin C solution drop by drop, shaking after every 5-10 drops, until the blue-black color disappears. Count the drops.
6. Keep the tube to check for the same final color in all tests.
7. Repeat steps 1-3 in a fresh test-tube.
8. Add fruit juice drop by drop until the color matches the first test-tube. Count the drops.
9. Test at least two different juices.
10. Create a table showing the number of drops needed for all juices tested and the vitamin C solution.

**Safety:** Wear eye protection during the experiment.

**Questions:**

1. Which juice has the most vitamin C of the ones you tested? Explain how you can tell.
2. Which juice has the most vitamin C in the whole class?

**Introduction to Lesson 2: Boosting Immunity with Vitamins**

Are you ready to unlock the secrets of our body's mighty defenders, the immune system? Just like superheroes, our immune system works tirelessly to keep us safe from harmful invaders. But did you know that vitamins can be our immune system's sidekicks, helping it fight off germs and keep us healthy? In our second lesson, we'll discover how vitamins team up with our immune system to ward off sickness and keep us strong and resilient. Get ready to become immune system champions!

**Experiment Title: The Importance of Vitamin C for Immune Health**

**Objective:** To demonstrate how a lack of vitamin C can weaken the immune system's response to infection.

**Materials Needed:**

- Fresh oranges or orange juice
- Gelatin (unflavored)
- Small plastic cups or containers (Petri dishes)
- Water
- Sugar (optional)
- Stirrers or spoons
- Timer
- Gloves (optional, for hygiene)

**Procedure:**

**1. Preparation:**

- Divide the class into small groups.
- Explain the purpose of the experiment and provide each group with the necessary materials.

**2. Making the "Immune System":**

- Prepare gelatin according to the instructions on the package. Use slightly less water than instructed to make the gelatin firmer.
- Pour the gelatin mixture into small plastic cups to create molds resembling immune cells (e.g., white blood cells).
- Place the cups in the refrigerator to set.

**3. Creating Vitamin C Deficiency:**

- Instruct one group to add fresh orange juice (rich in vitamin C) to their gelatin molds before refrigerating.
- Instruct another group to add water instead of orange juice to their gelatin molds, creating a "vitamin C-deficient" environment.

**4. Observation and Waiting:**

- While the gelatin sets, discuss with the students the role of vitamin C in immune health and its importance for fighting infections.
- Allow the gelatin to set for at least an hour or as per the gelatin package instructions.

#### **5. Testing the Immune Response:**

- Once the gelatin is set, carefully remove the molds from the cups.
- Use a toothpick or small stick to puncture each gelatin mold, simulating an infection.
- Observe and compare the reactions of the gelatin molds from the "vitamin C-deficient" group and the group with added orange juice.

#### **6. Discussion:**

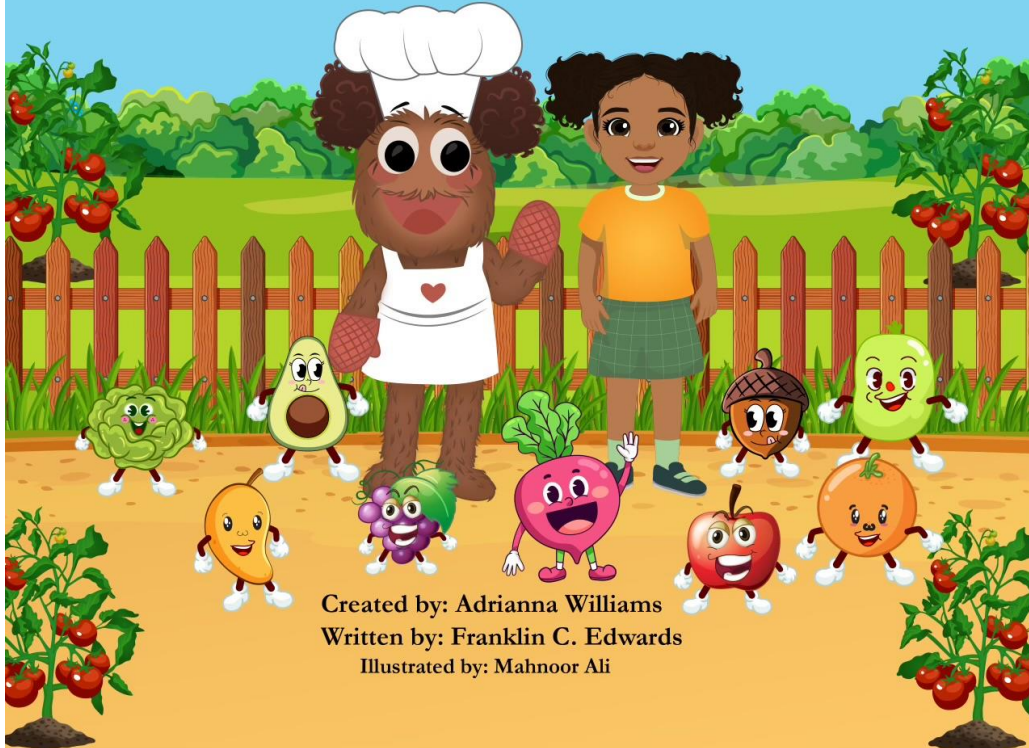
- Ask students to observe and note any differences in the resilience of the gelatin molds to "infection."
- Discuss the results with the class, emphasizing how the group with added orange juice (vitamin C) showed a stronger immune response compared to the deficient group.
- Explain how vitamin C helps boost the immune system's ability to fight off infections and maintain overall health.

**Conclusion:** Conclude the experiment by summarizing the importance of vitamin C for immune health and encouraging students to eat a balanced diet rich in fruits and vegetables to ensure they get an adequate intake of essential vitamins.

#### **Safety Considerations:**

- Ensure proper hygiene practices during the experiment, such as washing hands before and after handling materials.
- If using gloves, ensure they are latex-free for students with allergies.
- Supervise students when using sharp objects like toothpicks.

# Chef Cookie and The Vitamin Family



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PAIR THIS LESSON PLAN PERFECTLY WITH OUR  
BOOK *CHEF COOKIE AND THE VITAMIN FAMILY!*