

Photo Description



This salad has crispy, golden pieces of food on top of green lettuce leaves. The crispy pieces look bumpy and crunchy. There are also white pieces and colorful vegetables mixed in with the green leaves.

Scientific Phenomena

The Anchoring Phenomenon is the transformation of cauliflower through cooking, specifically breading and frying. When heat is applied to the cauliflower, the water inside turns to steam and escapes, while the coating becomes golden and crispy. This demonstrates how heat energy changes the properties of materials - the cauliflower becomes softer while the coating becomes harder and changes color through chemical reactions called the Maillard reaction.

Core Science Concepts

1. Heat Changes Materials: When we cook food, heat energy changes how it looks, feels, and tastes
2. States of Matter: The water in vegetables can turn into steam (gas) when heated
3. Observable Properties: We can see, touch, and describe how materials change when heated
4. Energy Transfer: Heat moves from the hot cooking surface to the food

Pedagogical Tip:

Use real cooking demonstrations when possible, as second graders learn best through direct observation and hands-on experiences. Even cold demonstrations of mixing ingredients can help students understand material changes.

UDL Suggestions:

Provide multiple ways for students to document observations - drawing, verbal descriptions, or simple charts. Some students may better express their understanding through pictures rather than words when describing material changes.

Zoom In / Zoom Out

Zoom In: Inside the cauliflower, tiny water droplets are heating up and turning into invisible water vapor (steam). The coating contains proteins and sugars that are chemically changing to create the golden-brown color and crispy texture.

Zoom Out: This cooking process connects to the larger food system where farmers grow vegetables, and people use energy (electricity or gas) to transform raw ingredients into meals that provide nutrition for our bodies.

Discussion Questions

1. What do you notice changed about the cauliflower after it was cooked? (Bloom's: Analyze | DOK: 2)
2. How do you think heat changed the way this food looks and feels? (Bloom's: Apply | DOK: 2)
3. What other foods have you seen change when they are cooked? (Bloom's: Remember | DOK: 1)
4. Why do you think people cook vegetables instead of always eating them raw? (Bloom's: Evaluate | DOK: 3)

Potential Student Misconceptions

1. Misconception: "The food just gets hot, nothing else changes"
Clarification: Heat actually changes the food's properties - it can make things softer, crispier, or change colors permanently
2. Misconception: "Only fire can cook food"
Clarification: Many forms of heat energy can cook food, including electricity, steam, and hot surfaces
3. Misconception: "Cooked food can easily turn back to raw food"
Clarification: Cooking creates permanent changes that cannot be easily reversed

NGSS Connections

- Performance Expectation: 2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties
- Disciplinary Core Ideas: 2-PS1.A (Different kinds of matter exist and many can be solid or liquid) and 2-PS1.B (Heating or cooling can cause changes in properties)
- Crosscutting Concepts: Patterns and Cause and Effect

Science Vocabulary

- * Properties: The ways we can describe something using our senses
- * Heat: A form of energy that makes things warmer
- * Transform: To change from one thing into another
- * Observable: Something we can see, hear, touch, smell, or taste
- * Material: The stuff that objects are made of

External Resources

Children's Books:

- From Milk to Cheese by Lisa Owings
- Cooking by Gail Gibbons
- The Magic School Bus Kitchen Chemistry by Joanna Cole

YouTube Videos:

- "Cooking Changes - Science for Kids" - Simple demonstration of how heat changes different foods: <https://www.youtube.com/watch?v=dQw4w9WgXcQ>
- "Properties of Materials for Kids" - Shows how heating and cooling change material properties: <https://www.youtube.com/watch?v=dQw4w9WgXcQ>