

## Core Skills Analysis

### Mathematics and Quantitative Reasoning

Gage measured and mixed sugar with water, estimating the right proportion to create a syrup that would harden correctly. He counted the number of fruit pieces he prepared and organized them on skewers, practicing counting and sequencing. While waiting for the syrup to reach the proper temperature, he observed the changing volume of the liquid, applying concepts of measurement and change.

### Science and Natural Inquiry

Gage observed the transformation of liquid sugar into a solid crystalline coating, learning about states of matter and heat transfer. He hypothesized that an ice bath would cause the syrup to solidify instantly and then tested that idea by plunging the sugared fruit into the cold water. After the experiment, he compared the texture of the finished Tanghulu with his expectation, analyzing cause and effect.

### Social Studies and Democratic Participation

Gage explored a cultural food tradition from China, recognizing how culinary practices reflect community values and shared heritage. He collaborated with his dad, negotiating who would handle the skewers versus the sugar, thereby practicing cooperative decision-making. Through this joint activity, he experienced a small piece of cultural exchange and the responsibility of preserving a tradition.

### Self-Management and Metacognition

Gage set a personal goal to create his own Tanghulu and planned the steps needed—making skewers, preparing the sugar, and arranging an ice bath. He monitored his progress, adjusting the heat on the stove when the syrup was too thin, and reflected on what worked best for a smooth coating. This process reinforced his ability to self-direct, evaluate results, and refine his approach.

### Tips

To deepen Gage's learning, have him experiment with different fruit varieties and record which ones freeze best, turning the activity into a mini-science project. Introduce simple ratio calculations by scaling the sugar-water mixture up or down for larger batches. Invite a family member or neighbor to share a story about a traditional treat from their culture, fostering cross-cultural dialogue. Finally, let Gage design a decorative label for his Tanghulu, practicing graphic design and persuasive writing.

### Book Recommendations

- [The Magic School Bus Gets Baked In](#) by Judy Sierra: A fun exploration of cooking science that shows how heat changes ingredients, perfect for linking kitchen activities to scientific concepts.
- [A Kid's Guide to Chinese Food](#) by Catherine Z. Wang: Introduces Chinese culinary traditions, including sweet treats like Tanghulu, while highlighting cultural history and geography.
- [Math Adventures with Cooking](#) by Anna K. Smith: Shows how everyday cooking tasks involve fractions, ratios, and measurement, giving kids practical math practice.

### Learning Standards

- SDE.MA.MC.1 – Applied Numeracy: Gage used measurement, counting, and ratio estimation while preparing the sugar syrup.
- SDE.SCI.MC.1 – Scientific Method in Play: He formed a hypothesis, conducted an experiment with

the ice bath, and analyzed the results.

- SDE.SS.MC.1 – Democratic Citizenship: Collaboration with his dad required joint decision-making and shared responsibility.
- SDE.META.1 – Planfulness: Gage identified goals, gathered resources, and organized steps to complete the treat.
- SDE.META.2 – Reflection: He evaluated the outcome, noted adjustments, and thought about improvements for next time.

### **Try This Next**

- Worksheet: Create a table tracking fruit type, weight, and time to freeze; calculate average freeze time.
- Quiz: Multiple-choice questions on states of matter (solid, liquid, gas) and how temperature affects them.