

Grade 2 Clarifying Lessons: What's Poppin'?

OLD Resources. These resources have NOT yet been updated to align with the revised elementary mathematics TEKS. These revised TEKS were adopted by the Texas State Board of Education in 2005, with full implementation scheduled for 2006–07. These resources align with the original TEKS that were adopted in 1998 and should be used as a starting point only.

What is a Clarifying Lesson?

A model lesson teachers can implement in their classroom. Clarifying Lessons combine multiple TEKS statements and may use several Clarifying Activities in one lesson. Clarifying Lessons help to answer the question "What does a complete lesson look like that addresses a set of related TEKS statements, and how can these TEKS statements be connected to other parts of the TEKS?"

TEKS Addressed in This Lesson

Patterns, relationships, and algebraic thinking: 2.6A, B, C

Measurement: 2.9A, B

Underlying processes and mathematical tools: 2.12A, B, C, D; 2.13A, B; 2.14

Materials

- popcorn (unpopped)
- popcorn popper (preferably one not needing oil)
- a variety of measurement tools for mass/weight and capacity/volume
- chart paper

Lesson Resources

Popcorn by Tomie de Paola

Lesson Overview

Students determine and compare weights and volumes of popped and unpopped corn to make predictions and solve problems.

Mathematics Overview

Students use concrete models that approximate standard units to measure the weight/mass and capacity/volume of unpopped corn and of the corn when popped, organize the measurements into a table from which the measurements can be compared, and use the patterns in the table to make predictions and solve problems about the measurement relationships of popped corn to unpopped corn.

Set-up (to set the stage and motivate the students to participate)

1. Use one of the following situations to motivate student interest in the change in popcorn kernels when they are popped. (2.12A)

Show the class a container of popped popcorn (made previously from 2 scoops of kernels) and 2 scoops of unpopped kernels. Let the class hypothesize which would give them more to eat. Encourage reasoning to justify their choices.

Present the class with the problem of planning a party with popcorn for refreshments. How many scoops of popcorn kernels would we need to pop for everyone to have a bag of popped popcorn?

Present the class with making the decision of what kind of popcorn to buy for party refreshments. (One of the criteria for deciding would be which popcorn provides the most to eat.) How can we determine which one is best?

Read *Popcorn* by Tomie de Paola.

2. Work with the whole class to develop a plan for comparing the popcorn before and after it is popped. Important points of discussion would include characteristics that you would want to measure, tools, units, and procedures to use to measure the popcorn kernels before popping compared to tools, units, and procedures to use to measure the popcorn after popping, and methods for recording data. (2.9A; 2.12B, C, D)
3. Have students make predictions about the measurements they have decided to make and record the predictions. (2.9A, 2.13A)
4. Have each group measure out 2 scoops of kernels to pop (or to be popped by the teacher). Make sure each group makes the agreed upon measurements before popping the kernels. (2.9B)
5. Have each group make the agreed upon measurements of the popped popcorn and record their data. (2.9B)
6. Combine the groups' data into a class set of data. (2.6A) For example:

Weight of kernels	Weight of popped corn	Volume of kernels	Volume of popped corn

7. Have students construct questions, statements, and story problems from the data. (2.6B, C; 2.13B)

Teacher Notes (to personalize the lesson for your classroom)**Guiding Questions (to engage students in mathematical thinking during the lesson)**

- Do you need to count the kernels? Why or why not? (2.9B, 2.14)
- Why did you choose this type of measurement tool over another? (2.9B, 2.14)
- How will you record your information? Why? (2.13A, 2.14)
- What things do you need to make sure to keep the same, if anything? Why? (2.12B, C; 2.14)
- What did you decide to do with the unpopped kernels? Why? (2.12B, C; 2.14)
- How did the weight of the popcorn change after being popped? (2.6B, C; 2.13B)
- How did the volume of the popcorn change after being popped? (2.6B, C; 2.13B)
- Do you see a pattern? (2.6B, C)
- How could you explain the changes you see in your data? (2.12A, 2.13B)
- How does your data compare with another group's data? (2.12C)
- What do you think would happen if you measured and popped another 2 scoops of popcorn?

Teacher Notes (to personalize the lesson for your classroom)**Summary Questions (to direct students' attention to the key mathematics in the lesson)**

To determine students' understanding of the measurement process and the measurement data generated, ask questions such as:

- What procedures did your group use to measure? (2.9A, B) Which ones do you think worked the best? (2.14)
- How was your group's procedures for measuring and recording data different from, or similar to, the procedures of another group? (2.9A, B; 2.12B, C, D)

- What changes did you notice in the weight after popping? (2.6B)
- What changes did you notice in the volume after popping? (2.6B)
- What patterns did you notice in the changes in weight? In volume? (2.6B)

To encourage students to use their measurement data to solve problems, draw conclusions, and make predictions, ask questions such as:

- If it takes up so much more space, why didn't it weigh more? (2.12A, 2.6C)
- How can we use the data to answer our question (e.g., What volume of kernels is needed to provide each person in the class with a certain amount for a party)? (2.12B, C, D)
- If we repeated the experiment, would the results be the same? Why or why not? (2.14)
- Why did we all start with 2 scoops of kernels? (2.12B, C)
- Did the number of kernels you started with match the number of pieces of popcorn after popping? Why or why not? (2.14)
- How could we use the information we generated in this activity? (2.12A)

Teacher Notes (to personalize the lesson for your classroom)

Assessment Task(s) (to identify the mathematics students have learned in the lesson)

- Have students choose an appropriate measurement unit and tool to measure the weight or volume of a given amount of dry cereal, do the measuring, and record the measurement.
- Have students write, or dictate, a story about how the information about the relationship between unpopped corn and popped corn might be helpful to them in the future.
- Have students write about, dictate, or draw a picture of a situation using the data in the table.

Teacher Notes (to personalize the lesson for your classroom)

Extension(s) (to lead students to connect the mathematics learned to other situations, both within and outside the classroom)

- Students can use other types of food to investigate changes. For example, compare peanuts (or other seeds) before and after shelling, compare grapes (or other fruits) before and after drying, compare popsicles before and after melting, compare beans before and after soaking.
- Students can discuss how the data collection should change if salt, butter, or oil is used when popping the corn. They can use the new plan to collect a new set of data and compare it to the old.
- Students can use the data to determine how many ounces of popcorn would need to be popped for each person in the class to have 1 cup of popped corn.
- Students can predict what would happen if 2 scoops of popcorn was popped for only half the amount of time. Would the volume be half as much? The teacher can help them test their predictions.

Teacher Notes (to personalize the lesson for your classroom)