

## Pumpkin Guts Math Task Grades 3-5



**Warning! This is not your typical lesson plan!** The goal of this math task is to allow for students to be the ones doing the majority of the thinking and problem solving. They are not given the step-by-step instructions ahead of time like many of them are used to. Choosing to fight the battle of creating thinkers is not an easy one, but it is purposeful one. Also, this task, centered on problem solving, is designed to milk as many objectives from one scenario versus completely 20 problems on one content skill.

### Notice and Wonder

Bring a pumpkin to class (or variety of pumpkins), allow the students to investigate it and ask them:

"What do you notice about the pumpkin(s)?"

Anticipated Responses:

The pumpkin is round, orange, smooth, heavy, has ridges and a stem.

If you have multiple pumpkins, they may compare sizes, circumferences, colors, textures, and weights.



*\*Altus teachers suggested bringing the pumpkin(s) in at the beginning of the week and, during the investigation, have the students name the pumpkin and make him/her part of the class for the week. ☺*

"What do you wonder about ... insert clever pumpkin name here..?"

Anticipated Responses:

#### Single Pumpkin

- How much does "Fred" weigh?
- What is inside "Fred"?
- What is the stem for?
- How big around is Fred?
- How many seeds are inside?
- How does a pumpkin grow?

#### Multiple Pumpkins

- Does the tall pumpkin have more or less seeds than the shorter but rounder pumpkin?
- Which pumpkin is heavier and by how much?
- Does the heavier pumpkin have more seeds?

### Turning the Questions into Math

🎃 *How much does the pumpkin(s) weigh? How big around is it? How can you measure a round surface?*

Let the students brainstorm what tools they need to find the answers to these questions. Be prepared with string, rulers, tape measures, and scales (tip: bathroom scales are good for this, especially the digital ones. There is usually a small switch on the back that you can toggle back and forth from pounds to grams, depending on your objective...in my class it was metric measurement. I wanted them to have an anchor for length measured in cm/m weight measured in g/kg and capacity in l/ml).

Groups can also make a poster of "Fred" and label their picture with his measurements.



🎃 *What is inside? How many seeds are inside? Does the bigger pumpkin have more seeds?*

The best part of pumpkin explorations is getting to play in the guts! The drama students bring to the experience makes the mess worth it! You get to experience being a kid again and seeing it through their eyes. Before exposing the innards, have the students guess how many seeds are in the pumpkin(s).

Altus teachers suggested dividing the guts and seeds into 4 bowls for 4 groups and letting them explore and separate the stringy mass from the seeds. Have the students come up with their own strategy for counting the seeds. If you are using multiple pumpkins, have the students count the seeds of one pumpkin as a class and see if that helps them estimate the seeds in the other pumpkins before they dig into their group pumpkin.



*I feel like this is one of those silly “Do not attempt...” warnings at the bottom of stunt commercials, but, of course, make sure an adult is in charge of any carving utensils; sharp blades and students don’t mix. Now would be a good time to mention, this would be a great parent involvement activity. Sometimes, parents who can’t come and participate will send a donation of a pumpkin instead.*

### **Milking the Problem**

Teacher’s Notice and Wonder after observing groups:

I noticed that some of you put your seeds in groups of ten, or counted by two, or... point out the various strategies students used to help them keep track of the seeds they were counting.

I wonder which one worked best? Start the discussion, knowing that it depends on the individual and guide the conversation to acknowledge that we all have different ways to solve the same problems.

Altus teachers also mentioned a fraction twist:

Once you have a total for all the seeds in the room, you can guide the conversation to include that Group A had 48 out of the total 123 seeds and make a fraction for each group. Compare the fractions with the same denominator and then add them showing that, with every seed added you will have the same numerator and denominator, 123 out of 123, and that equals 1, the whole quantity of seeds in the pumpkin.

### **Task’s Strengths**

1. Messy and time consuming! Thinking back to your experiences in school, which ones do you remember the most? Chances are, they are the ones where you were encouraged to get involved in something potentially messy. This experience will be something that stays with them for a long time to come and will also serve as an experience you can continuously link back to when you are working on a measurement skill. Explorations that double as anchor experiences are a valuable use of time.
2. Notice and Wonder- asking the students what they notice about the situation and then asking them what they wonder helps them generate the questions, fostering a natural curiosity and motivation to find the solutions versus being told what to find. Keeping the purpose of the lesson in mind, teachers should be ready to steer the conversation towards specific questions if it doesn’t flow that way naturally.
3. Students get to explore several possibilities, see other students’ thinking, and compare their outcomes to other students’ outcomes.
4. Working together in this exploration will help build teamwork and a classroom culture of cooperative learning.
5. Roasted pumpkins seeds are yummy and good for you too!!!

