Mathematically Speaking

Adapted from the work of R. Santa Cruz for the Understanding Language Initiative.

Purpose

This task gives students the opportunity to solve a problem and then explain and discuss how they arrived at their solution using targeted vocabulary. The activity is used for vocabulary review or guided practice.

The purpose of this task is to alert students to important vocabulary and terms *during* contextualized mathematics activity. Students are asked to listen for, track, and describe vocabulary they used while their group is solving a mathematics problem. It is crucial that students do this vocabulary work *after* they solve a mathematics problem that grounds the meanings for words.

Students will use everyday words while solving a mathematics problem or in early rounds of talking about their solutions with other students or the teacher, and they should not be corrected. Instead the teacher can provide more formal mathematical terms later during a whole class discussion.

Note that developing academic language involves more than just learning the target or specialized vocabulary of a unit or chapter. Comparative structures such as "twice as many, 3 less than 7" are syntactic structures that students also need as they use the target vocabulary of mathematics tasks.

Required for use

The teacher selects a set of key terms that the students have been introduced to within a task, lesson, or unit. The teacher prepares a chart or organizer for students to use.

Structure of the activity

All students independently complete both mathematical tasks or problems. They may use more space on a separate piece of paper, but must show their work

Students form pairs and and each pair should get one copy of the Mathematically Speaking chart.

Target vocabulary words are written on the chart in the left column. For lower grades, the teacher can fill in the words. The two students write their names across the top. One student explains how they solved the

mathematics problem to the other student as the other student uses a checkmark on the chart to record each time a target word is used in the explanation. The other student then takes a turn doing the same.

Students can keep talking until all target words have been used.

This activity may be used for practice or assessment after students have worked on a mathematics problem and teachers have provided instruction or modeled the formal usage of the target vocabulary.

To support students in refining their descriptions and explanations, students can ask each other these questions:

- Did my explanation make sense?
- Do you have any questions about what I did?
- Do you have any questions about why I did this?

To focus on their mathematical reasoning, students can ask each other these questions**:**

- What did you do to solve the problem or find an answer?
- Why did you do that step?
- Why is that step is justified mathematically?" or "What is a mathematical reason for that step?"

Process outline

1. Student pairs are formed.
2. Target vocabulary words are written on the Mathematically Speaking chart in the left column.
3. For lower grades, the teacher or volunteer may fill in the words.
4. The two students write their names across the top.
5. One student explains their solution to the other student as he or she writes a check on the chart each time a target word is used in the explanation.
6. Students keep talking until all target words have been used.
7. Students keep talking until all target words have been used.

Student Materials:
Mathematically Speaking

Date _____

Partner Names _____ & _____

Task Name _____

1. Solve the problem. Show your work
2. Explain your thinking, strategies, and solution to your partner. Use the target words in your explanation.
3. Listen to your partner's explanation and make a tally for each time he or she used the target vocabulary.

Explain how you solved the problem.	Explain how you solved the problem.
Problem 1	Problem 2

Vocabulary Words	Tally: How many times used
Example: **variable**	III

Vocabulary Words	Tally how many times used
Example: **Constant**	IIII