Building Mathematical Vocabulary in Primary Classrooms

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Today’s Targets...

● I can identify the steps in describing mathematical terms/vocabulary.

● I can identify ways to teach and reinforce mathematical vocabulary in my classroom.

● I can make a plan to use in my classroom.
Eliminate It!

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>1/4</td>
</tr>
<tr>
<td>1/3</td>
<td>4/6</td>
</tr>
</tbody>
</table>

Which of these does not belong?
Turn and talk about why you chose to ELIMINATE IT!
Why we started ....

School Improvement Plan:
Design and implement a comprehensive program to build math vocabulary in all students.
How we started....

- **Professional Learning:**
  Read *Building Academic Background Knowledge* by Robert Marzano and Debra Pickering (2005) as a staff book study
Eight Characteristics of Effective Direct Vocabulary Instruction

- Effective vocabulary instruction does not rely on definitions.
- Students must represent their knowledge of words in linguistic and non-linguistic ways.
- Effective vocabulary instruction involves the gradual shaping of word meaning through multiple exposures.
- Teaching word parts enhances student’s understanding of terms.
- Different types of words require different types of instruction.
- Students should discuss the terms they are learning.
- Students should play with words.
- Instruction should focus on terms that have a high probability of enhancing academic success.

*Building Academic Background Knowledge for Academic Achievement: Research on What Works in Schools* (pp. 70-90), Marzano
Mathematical Practice Standard 6

Mathematically Proficient Students Attend to Precision:

- calculate accurately and perform math tasks with precision
- communicate precisely through words and symbols
What we did ....

- Created a spreadsheet of all of the vocabulary in the current math curriculum plus terms found on tests
- Analyzed the list to identify “must know” vocabulary - core vocabulary - by grade level
- Created a scaffolded plan for how all grade levels would incorporate core vocabulary development through the use of word walls, vocabulary journals, writing prompts, literature and games and activities
- Investigated games and activities to support mathematical vocabulary development in the classroom
Formulating a Description....

Becky’s Second Grade Classroom

● In second grade, we create a class derived description.
● Students are given time to think, pair and then share.
● Then together, we create a description based on the ideas that are shared.
  ○ Students are likely to begin straying from the class derived description and make it more personal with their own information.
  ○ Descriptions may be revisited and built upon as learning develops.

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https://drive.google.com/file/d/0BwMkRs0hViC8UXdXMk9ZWTY5dTA/view?usp=sharing
Formulating a Description....

Erin’s Third Grade Classroom

- In third grade the students begin by building a description and recording important facts, pictures, examples and nonexamples as a group.

- Later, students build descriptions collaboratively with peers and share out with the group.

- Descriptions may be revisited and built upon as learning develops.
Second grade students have their own vocabulary folder where they record the description. Third graders keep pages in PLP binders.
Third Grade PLP Binder...

Vocabulary is recorded and kept in a “PLP” binder under a “vocabulary” tab. Pages are added or removed as needed.
Illustrating the term...

Although the description may be class derived, the drawing is specific to each student. The drawing has to be something that he/she identifies with and will help build understanding.
Self Assessing.....

After writing the description and drawing an example, the students rate their level of understanding:

1. I don’t understand this term.
2. I have some understanding of this term but sometimes I get confused.
3. I understand this term when I see it and I can use it in my talking and in my writing.
4. I understand this term, can use it in my talking and writing, and I could teach it to another student.

*As the year goes on, students should have the opportunity to go back and reassess and revise their levels of understanding.*
Your Turn...

Think of a term your students need to know. Go through the process of describing, drawing and self assessing. There is a larger form in your handouts.

<table>
<thead>
<tr>
<th>Term:</th>
<th>My Understanding</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Draw:</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Strategy Groups...

● Whole-group introduction to and practice with vocabulary (question of the day, writing/reasoning, games)

● Small-group vocabulary instruction

● Focus on students who:
  ○ require more specific language instruction
  ○ struggle with a math skill or concept

● Based on pre-assessment data and daily exit slips or observations
Frayer Model...

Students think about the term in a different way.

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https://drive.google.com/file/d/0BwMkRs0hViC8SC1zNjdwdl9EZUE/view?usp=sharing
Your Turn...

Think of a term your students need to know. Go through the process of describing, drawing and finding examples / non-examples.

There is a larger form in your handouts.

<table>
<thead>
<tr>
<th>Definition</th>
<th>Picture / Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example(s)</td>
<td>Non-Example(s)</td>
</tr>
</tbody>
</table>
Vocabulary is everywhere!

- Writing and Reasoning/Constructed Response
- Daily math discussions and explaining of thinking
- Math Congress
- Classroom Environment
Math Word Wall...
Assessment...

Along with daily work and observations, we assess our students quarterly and at the end of the year.
15 Which shapes are congruent to one another?

A

B

C

D

19 A ______ is a standard unit of length equal to 3 feet. It is part of the U.S. customary system of measurement.

A meter

B yard

21 The distance around the outside of a 2-dimensional figure is the ______.

A endpoint

B area

C square centimeter

D perimeter
Reinforcement...

- Reinforcing the vocabulary descriptions and examples is vital to maintaining and building understanding.

- Make it fun!
  - Play a game
    - Concentration
    - Go Fish
    - Jeopardy
    - Eliminate It!
  - Play Date/Dinner Party

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Play Date/Dinner Party...

● Pre-select vocabulary terms
● Identify a host/hostess and about five “guests” for each round
● Each guest receives one of the pre-selected terms and formulates a plan on how they will introduce themselves as that term.
● One at a time the guests approach the hostess and present themselves for the play date.
● Once the hostess know who they are, she invites the guest to join the play date.

LET’S PLAY!
Where to begin...

When you return to your classroom next week, or beginning next year, what is one thing you would like to try?

Turn and Talk with a neighbor and share your plan.
The End...

“The teaching-specific terms in a specific way is probably the strongest action a teacher can take to ensure that students have the academic background knowledge they need to understand the content they will encounter in school.”

Building Academic Vocabulary, Robert Marzano/Debra Pickering