

Speaking the Language of Mathematics

Grades 2-5

Sue O'Connell
@SueOConnellMath
Oct. 20, 2017

“Language is not only a tool for communicating, but also a tool for thinking. Every mathematics teacher is a language teacher — particularly the academic language used to formulate and communicate mathematics learning.” NCTM

Tips for Developing Math Vocabulary

- Define words using familiar language
- Model word meanings using examples, synonyms, and visuals
- Provide multiple exposures to key words
- Give opportunities to interact with words

Why is it difficult to speak the language of math?

- Specialized vocabulary (we only hear it in math class)
- Quantity of math words (So many!)
- Words with multiple meanings (like volume or power)
- Complex content

Word Webs

Ask students to turn and share words that relate to a specific topic (e.g., square, factor, numerator, decimals). Create a class word web using their words and discussing the meanings.

Sort and Label

Think about the math meanings of the words in the box below. Sort the words into groups based on their meanings in math. Pick a title or label for each group to show why the words belong together.

Sort and Label

yard	quart	feet	ounce
inch	scale	ruler	measuring cup
pint	degree	mile	thermometer
cup	pounds	gallon	ton



Sort and Label

o'clock	half	15
30	hour	60
quarter	12	minute



Double Meaning Words

Turn and tell your partner two meanings for each word.

At home it means... In math class it means...

feet
operation
yard
corner
odd

Highlight and Discuss Math Vocabulary

Before beginning a task have students highlight some words they think are important and talk about them. For example: Find the **odd** numbers in the pattern. *What does it mean to be an odd number?*

Creating Math Riddles

- I am a two-dimensional shape.
- I have 3 sides.
- I have 3 vertices.
- What am I?

What's My Word?

Select a word. Talk about the word (without using the word) until your partner gets it.

Mystery Word

Tape a mystery word on each student's back.

Students walk around the room and listen to clues from classmates to try to figure out their mystery word. Get them talking about math ideas!

Introducing Words Using Math Talk Charts

- Introduce and highlight critical words
- Pictures/examples
- Connections between ideas
- Phrases to explain

Vocabulary Logs

Have students record new words along with their meaning and an illustration and/or an example.

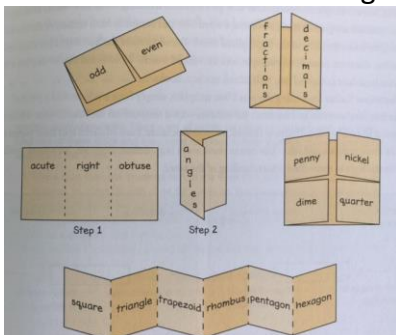
Build a Math Word Wall

Display the math words on a wall or bulletin board in your classroom. Play class games to provide students with opportunities to use the words from the wall.

1. Find 2 words on our wall that go together. Why?
2. Find the word that matches my clue.
3. Web words that go with my word.
4. Draw a picture to show my word.

Create Folded Books

Challenge students to show their understanding of math words and ideas by created folded math books. Have students fold paper to create math books in which they use words, pictures, numbers, and/or examples to share their understanding.



Match the Condition

Roll 2 numbers.

Use the numbers to match a condition on the board.

The first one to fill the board wins!

Looking For....	My Numbers
The sum is an even number greater than 8.	
The product is a multiple of 4.	
The difference is zero.	
The sum is a prime number.	
The product is even.	
The difference is between 3 and 8.	

From *Math in Practice, Grade 4*

Match the Condition

Roll 2 numbers.

Use the numbers to match a condition on the board.

The first one to fill the board wins!

Looking For....	My Numbers
The sum is an even number greater than 8.	
The product is a multiple of 4.	
The difference is zero.	
The sum is a prime number.	
The product is even.	
The difference is between 3 and 8.	

From *Math in Practice, Grade 4*

Match the Clue

- Roll 2 numbers.
- Use the numbers to match a clue on the board.
- The first one to fill the board wins!

Looking For....	My Numbers
The sum of the numbers is 10.	
Both number are odd.	
The difference is zero.	
Both numbers are even.	
The sum is an even number.	
The difference is less than 6.	

Match the Clue

- Roll 2 numbers.
- Use the numbers to match a clue on the board.
- The first one to fill the board wins!

Looking For....	My Numbers
The sum of the numbers is 10.	
Both number are odd.	
The difference is zero.	
Both numbers are even.	
The sum is an even number.	
The difference is less than 6.	

Word Boxes

Ask students to share their understanding of the word by following different prompts for each of the four boxes.

My definition:	An Illustration:
A real world use:	Other related words:

Math Vocabulary Bingo

Give each student a blank bingo card. Provide students with a list of words and ask students to write a word in each square (wherever they want on the bingo card). After students have completed their bingo cards, it's time to play! Describe a math word and have students place a chip on the correct word on their card. Students yell bingo when they have a row horizontally, diagonally, or vertically.

Helping Students Speak the Language of Math

- Highlight key vocabulary.
- Display words for reference.
- Encourage the use of examples and visuals.
- Expect students to use specific language.
- Provide varied and ongoing opportunities for students to talk using the language of math.

What will you try with your students?

For more ideas on developing math vocabulary, see the *Math in Practice* Guide for Teachers, Chapter 4. Grade-specific vocabulary lists are located in every module of the *Math in Practice* grade-level books.

<https://www.heinemann.com/mathinpractice/>

Teacher Resource Books by Sue O'Connell
Published by Heinemann (www.heinemann.com)

Math in Practice (www.mathinpractice.com)

This series is filled with lesson ideas, instructional strategies, practice tasks, and many online printable resources to make teaching K-5 math more meaningful and more fun. There is a book for each grade level K-5 that contains a wealth of grade-specific activities, as well as a *Guide for Teachers* filled with instructional strategies to support greater understanding of math concepts. A *Guide for Administrators* offers tips and strategies for math coaches/administrators. Visit the website at www.mathinpractice.com to view samplers, see videos, and learn more about the series.

Putting the Practices into Action - Implementing the Common Core Standards for Mathematical Practice K-8 with John SanGiovanni

The Standards for Math Practice are the heart and soul of the Common Core State Standards. This book explains each standard in teacher-friendly terms and highlights practical activities to make the standards come alive in classrooms. It contains PLC study group questions and online resources.

Mastering the Basic Math Facts for Addition and Subtraction
Mastering the Basic Math Facts for Multiplication and Division

with John SanGiovanni

Through investigations, discussions, visual models, children's literature, and hands-on explorations, students explore the math operations, and through engaging, interactive practice achieve fluency with basic facts. A teacher-friendly CD filled with customizable activities, templates, recording sheets, and teacher tools simplifies your planning and preparation. Over 450 pages of reproducible forms are included in English and Spanish translation.

The Math Process Standards Series

Each book in this series is a practical guide for helping students refine their skills in the highlighted math process (problem solving, communication, reasoning, representations, connections). You will find specific teaching strategies and tips to help all students strengthen their skills. Included with each book is a CD filled with teacher tools and customizable student activities to allow you to change names, data, or spacing for a quick way to differentiate instruction within your classroom.

Introduction to Problem Solving ***Introduction to Communication***
Introduction to Representation ***Introduction to Reasoning and Proof***
Introduction to Connections

All books in this series are available for Grades PK-2, Grades 3-5, and Grades 6-8.

For additional resources, visit Sue's website at www.qualityteacherdevelopment.com

To stay in touch:

Follow Sue on Twitter @SueOConnellMath
Like the Quality Teacher Development Facebook page
Join our Math in Practice Facebook group!