Language Development in Mathematics

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Language Development

• Focus on your students
  • Where do they struggle?
  • How do you help them overcome their struggles?
  • How might you modify ideas to better support your students?

Caution - believe in your kids!
Geometry - a huge world of words

- Explore the card stock shapes with your partners
- Sort them any way you like
- Record words you used as you discussed the pictures
Mathematics Terminology

• Why?
• What?
• How?
Mathematics Terminology

• Why?
  • Because the Common Core says I have to...
  • Yes & No
Common Core State Standards
Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.
Mathematics Terminology

• Why?
  • To describe
  • To clarify
  • To understand
• To describe accurately
• To describe accurately and efficiently

Add in flexibility and one becomes fluent
Mathematics Terminology

• Where does language (words) come from?

“necessity is the mother of invention”
Mathematics Terminology

- What?
  - Math-related / context words
  - Math language
Math-related / context words

Pentomino
Dice
Efficient
Estimate
Predict
Calendar
Strategy

Tool
Manipulative
Calculator
Total
Math Language

Symmetry          Growing pattern
Equation          Composition/decomposition
Rectangle         Prism
Area
Percent
Pictograph
Mean
Expanded Form
Math Language

• How?
  • Strategies
    • Concept development -> operational/working definition -> Terminology
    • Discover/learn the concept
    • Patterns - examples & non-examples
    • Sorts
Inventing terminology through sorting
- **Dicotomous Sort**

- Remove those shapes that represent 3-D
- Use a Frayer Model to record your thoughts along the way

**Dicotomous Sorts:**

1. Shapes that are closed
2. Shapes that have straight sides
3. Shapes whose sides don’t cross
4. Shapes with 4 sides
5. Shapes with square corners
Inventing terminology through sorting
- Dicotomous Sort

Rectangle

- Add to your Frayer
  - Examples
  - Non-examples
  - Operational Definition
Rectangle

1. A parallelogram with four right angles (Webster’s Dictionary)

2. A plane figure with four straight sides and four right angles (Webster’s Dictionary)

3. A quadrilateral with two pairs of congruent parallel sides and four right angles (Math on Call)

4. A quadrilateral with four right angles
Rectangle

A quadrilateral with four right angles
Dichotomous Sort

1. Planning for concept development - teacher
   1. Formal definition
   2. Identification of sorts to reach operational definition

2. Constructing meaning - student
   1. Open sort
   2. Dichotomous sort (open)
   3. Dichotomous sorts (prescribed)
   4. Operational/working definition
Graphic Organizers - Venn Diagram

- Shapes fit in classes (families)

- Polygon
  - Quadrilateral
    - Parallelogram
      - Square
        - Rectangle
          - Rhombus
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Bridging to Practice

1. Pick an idea that came up today that you found particularly interesting. What is your current thinking about this idea?

2. What are one or two things that you will go back and pursue to move yourself along with this idea?