Building Academic Vocabulary in the Content Areas

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Academic Language

• **Academic language** is oral and written language used for academic purposes. It is the language necessary for students to learn content in schools. Academic language is the means by which students develop and express content understandings. Academic language includes the “language of the discipline” (vocabulary and functions and forms of language associated with learning outcomes in a particular subject) and the “instructional language” used to engage students in learning content (TPA, 2011).
Academic Language

• Why is academic language important in your teaching?
• What challenges do your students have with academic language?
Agenda

• Academic Language in the Math and Science Standards
• Frayer Model
• Vocabulary Self-check
• Concept Mapping
• Compare & Contrast
• Foldables
• Games
• And more! 😊
Vocabulary Facts

- **English Language** (S. Lenski)
  - 290,000 different words
  - Up to 2 million words including word forms
  - Textbooks have 400,000 different words
  - Students need 30-40 exposures to new words before they really know them (60-70 for ELL)
  - Students remember from 25-40% of the new words you teach
  - The average student in grades 3 -12 is likely to learn 3,000 new words every year or 7 -10 words every day.
Content Vocabulary Guidelines

1. Identify the conceptual ideas for the lesson.

2. Use the standards and words from text to determine the academic language needs for the lesson.

3. Examine the list to determine how the terms should be taught.
Content Vocabulary Guidelines

4. Develop activities to introduce, build, and refine the word meanings before reading.

5. Develop activities to support word meanings during reading.

6. Develop activities to extend/reinforce word meanings after reading.

7. Develop content specific activities.
Using the Minnesota Academic Standards

New standards have the addition of *examples* given for many of the benchmarks

- MCA-III Test Specifications give the *vocabulary allowed* for many of the benchmarks.

- Math & Science Frameworks:  
Example: 3rd gr. Math

• 3.1.1.4:

• For example: 8726 rounded to the nearest 1000 is 9000, rounded to the nearest 100 is 8700, and rounded to the nearest 10 is 8730.

• Vocabulary allowed in items: estimate, round
Example: Science

- 8.3.4.1.2

- For example:
  Agricultural runoff influences natural systems far from the source.

- 8.3.3.1.5

  Additional vocabulary may include terms such as rotate, revolve, and orbit.
Six Steps to Better Vocabulary Instruction (Marzano, 2009)

- Provide a description, explanation, or example of the new term.
- Ask students to restate the description, explanation, or example in their own words.
- Ask students to construct a picture, pictograph, or symbolic representation of the term.
Six Steps to Better Vocabulary Instruction (Marzano, 2009)

• Engage students in activities that help them add to their knowledge of the terms in their vocabulary notebooks.

• Ask students to discuss the terms with one another.

• Involve students periodically in games that enable them to play with terms.
# Graphic Organizer - Frayer Model

<table>
<thead>
<tr>
<th>Definition in own words</th>
<th>Picture, symbol, etc. for word</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>Term</th>
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</table>

<table>
<thead>
<tr>
<th>Examples</th>
<th>Non-examples</th>
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</table>

**Term**

**Definition in own words**

**Picture, symbol, etc. for word**

**Examples**

**Non-examples**
At your table, choose a term from the following:
MATH: round, estimate, range, mean, factor, check
SCIENCE: orbit, planet, acid, photosynthesis, ecology
SOCIAL STUDIES: constitution, amendment, community, republic, democracy

Complete the Frayer model for your term

Be prepared to SHARE!
Vocabulary Self-Check

• Before students read a selection, have students write the vocabulary words in the left column of the chart.
• Students rate their knowledge of the words in pencil using:
  + they can give an example & definition (write on sheet)
  ? they can give an example or definition (write on sheet)
  - they do not know the definition or example
• Make a copy of the sheet as a pretest. Then have students complete the sheet throughout the unit until all are + with examples and definitions.
Concept Mapping

- Inspiration software
Sample concept map

Units
- Metric
  - meter
  - cm
  - km
  - liter
  - gram
  - Celsius
- Customary
  - foot
  - inch
  - mile
  - quart
  - ounce
  - pound
- Nonstandard
  - pencil
  - paper clip
  - glass

Tools
- ruler, tape measure
- scale
- cup
- clock
- thermometer
- protractor

Measurement

Types
- Length (1-dim)
  - width
  - height
  - perimeter
  - circumference
- Cover (2-dim)
  - area
  - surface area
- Volume (3-dim)
  - volume
- Other
  - capacity
  - weight
  - mass
  - time
  - temperature
  - angle
  - measure

Formulas
- rectangle: $A = lw$
- perimeter: $P = 2(l + w)$
- circle: $A = \pi r^2$
- circumference: $C = 2\pi r$
- sphere: $V = \frac{4}{3}\pi r^3$
- cylinder: $V = \pi r^2h$
Compare & Contrast

Parallelograms

Squares

Rectangles
Foldables – Dinah Zyke

• Tab Book
  – Mean, median, mode
  – Slope: positive, negative, and zero
  – Angles

• Layered – Look Book
  – Properties
  – 3-D Shapes
  – Quadrilaterals

Using puzzles for teaching vocab

Using word-find puzzles – Good for identification of words

Using cross-word puzzles, teacher-made – Better, for learning terms

Using cross-word puzzles, STUDENT-made – BEST for learning/understanding vocab

http://puzzlemaker.com
Interaction, Practice & Application

• I have, who has
  (www.mathnstuff.com/papers/games/whohas/whointr.htm)

• 10,000 Pyramid

Games taken from “Supporting Math Vocabulary Acquisition”, Teaching Children Mathematics, Nov. 2009
Set up for Pyramid Game
Set up for Pyramid Game
10,000 Pyramid

Element

Atom

Neutron

Proton

Nucleus

Electron
Powerpoint Templates for Games

Vocabulary Games for any content area, and grade level:

- Jeopardy
- Taboo
- Pictionary
- Others...

http://www.csun.edu/science/ref/games/
More Activities for Content Vocabulary

The following slides give more ideas for ways to improve academic vocabulary in your classes – take a look to see which might work with your students!
3-Way Tie Organizer

- Identify a concept with two other related terms.
- Write one in each oval
- Complete the connectors by writing how each term connects to the other.
- Write how they are the same on the inside of the triangle and how they are different on the outside
- Write a summary of these concepts, drawing on the vocabulary in the connector.

![Diagram](image)
Cinquain Organizer

• First summarize everything you know about the topic, then follow the model.
• Let’s create a Cinquain for the concept

Triangles
Pointy Edges
Revolving, rotating, angling
Triangles are all different.

180 °
Cinquain Organizer

Now you try it!

One word (subject or noun)
Two words (adjectives)
Three words (action verbs)
Four words (feelings, a complete sentence)
One word (summary word for topic)
## Personal Dictionaries

<table>
<thead>
<tr>
<th>Word</th>
<th>My Definition</th>
<th>Glossary Definition</th>
<th>Differences</th>
<th>Visualization</th>
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The Algorithm Collection Project’s Virtual Vocabulary Wall: [http://www.csus.edu/indiv/o/oreyd/ACP.htm_files/vocabwall.htm](http://www.csus.edu/indiv/o/oreyd/ACP.htm_files/vocabwall.htm)
Smartboard Activities

- Click here for Elementary
- Click here for Secondary
Questions

Thank you for attending!!

(SmartBoard files available if you have a flash drive)
Resources


Refer to “Supporting Math Vocabulary Acquisition” menu activities (attached)
Resources Continued

Go to www.eric.ed.gov and search by ERIC #
- Teaching Reading in Social Studies - ED432008
- Teaching Reading in Science - ED469112
- Teaching Reading in Mathematics - ED469111

Academic Vocabulary Sites
- Vocabulary Games: http://www.csun.edu/science/ref/games/
- I Have Who Has Game: www.mathnstuff.com/papers/games/whohas/whointr.htm
- Puzzles: http://puzzlemaker.com
- Concept Maps: IHMC Cmap Tools: http://cmap.ihmc.us/
Resources Continued

Foldables

- *Reading and Studies Skills Foldables for Social Studies*: http://teacherweb.com/FL/BelleviewMiddleSchool/MrsVNNormand/foldables.pdf
- *Gr. 7-12 Foldables in Mathematics*: http://mathnmind.com/PDF%20Files/Pre-Algebra/dzf.pdf