

## Improving the Development of Mathematical Vocabulary

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### By the end of this session...

#### You will:

- understand characteristics of effective vocabulary instruction
- understand a six-step process for direct instruction in vocabulary, and
- be presented with a range of strategies and tools that can be used within this framework

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## Visible Learning

John Hattie



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## Visible Learning

John Hattie

Reading: Vocabulary Programs

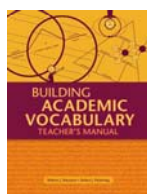
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*The most effective vocabulary teaching methods included providing both definitional and contextual information involved students in deeper processing, and gave students more than one or two exposures to the words they were to learn. (Hattie, 2009)*

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## Building Academic Vocabulary Teacher's Manual

Robert J. Marzano & Debra J. Pickering



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## Impact of Direct Vocabulary Instruction

- Research shows a student in the **50th percentile** in terms of ability to comprehend the subject matter taught in school, with no direct vocabulary instruction, scores in the **50th percentile** ranking.
- The same student, after specific content-area terms have been taught in a specific way, raises his/her comprehension ability to the **83rd percentile**.

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## Some Interesting Correlations

- 2011 NAPLAN scores
- 527 year 7 students
- 426 year 9 students

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## Some Interesting Correlations

YEAR 7 2011	r	r <sup>2</sup>
Reading v Maths	0.70	49%
Reading v Writing	0.64	41%
Reading v Spelling	0.65	42%
Reading v Grammar	0.75	57%

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## Some Interesting Correlations

YEAR 9 2011	r	r <sup>2</sup>
Reading v Maths	0.60	37%
Reading v Writing	0.54	30%
Reading v Spelling	0.50	25%
Reading v Grammar	0.69	48%

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## Why?

- Why does vocabulary instruction have such a profound effect on student comprehension of academic content?

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## Consider this...

- Background knowledge is more important to the understanding of reading than IQ.  
and
- Vocabulary instruction in specific content-area terms builds up student's background knowledge in content area.

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## What It Means to Us...

- It is not necessary for all vocabulary terms to be directly taught.
  
- Yet, direct instruction of vocabulary has been proven to make an impact.

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## Which Words?

- Decide on number of words to be taught directly at each grade level (P-2, 3-5, 6-8, or 9-12)
- Suggestion: 1 word per week.
- Therefore, plan for approximately 35 math terms per year.

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## Picking Terms to Teach

- Is the term critically important to content I will be teaching this year?
- Scan through level of terms, highlight any term that will be vital to understanding.
- If selection list totals more than original estimate, revise plan.
- Add words to reflect VELs or Australian Curriculum materials.

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## Six-Steps for Teaching New Terms

- First 3 steps – introduce and develop initial understanding.
- Last 3 steps – shape and sharpen understanding.

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## Step 1

**Provide a description, explanation, or example of new term.**

- Introduce direct experiences
- Story telling
- Video
- Poster

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**Step 2**  
**Students restate explanation of new term in own words.**

STUDENT NAME	DATE	STUDENT NAME	DATE

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## Step 3

**Students are to construct a picture, symbol or graphic representing the word.**

- Web 2.0 tools
- Maths walls

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#### Step 4

**Students periodically do activities that help add to knowledge of vocabulary terms.**

- origin of words
- Similarities and differences
- Synonyms and antonyms
- analogies

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#### Step 5

**Periodically students are asked to discuss terms with one another.**

- Reflection strategies

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#### Step 6

**Periodically students are involved in games that allow them to play with terms.**

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Wheel of Fortune

Who wants to be a Millionaire?

Vocabulary Charades

Pictionary

Who am I?

Taboo

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#### Summary

- 1 term per week for 35 weeks to teach target terms.
- Set aside time periodically to engage students in vocabulary activities, adding to knowledge base.
- Allow students to discuss terms.
- Encourage students to add information to notebooks and journals.

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## Final Thought

*Teachers, schools, and districts that embrace a comprehensive approach of building academic vocabulary will see impressive results in classrooms and on achievement tests. (Marzano)*

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## Readings

- *ASCD Report: The Effects of Focused Academic Vocabulary Instruction on Underperforming math students*  
*Margie Gifford and Susan Gore*
- *What role does vocabulary instruction play in the mathematics classroom?*  
*McREL*

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