Infusing Vocabulary and Reading Comprehension Strategies into the Algebra Classrooms

10:10 - 11:10 a.m.

Room S313

MCTM 2024 Coaching Conference

Stevenson University

Celita Lewis-Davis, Ed.D.

https://bit.ly/4bWJzgg

select readers

Agenda

01

Introduction

My background and the why

02

Vocabulary Ideas

Research and ideas about vocabulary strategies

03

Comprehension Ideas

Research and ideas about comprehension strategies

04

Wrap Up

Conclusion, Questions and Feedback

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CELITA LEWIS-DAVIS

MCPS Secondary Math Specialist

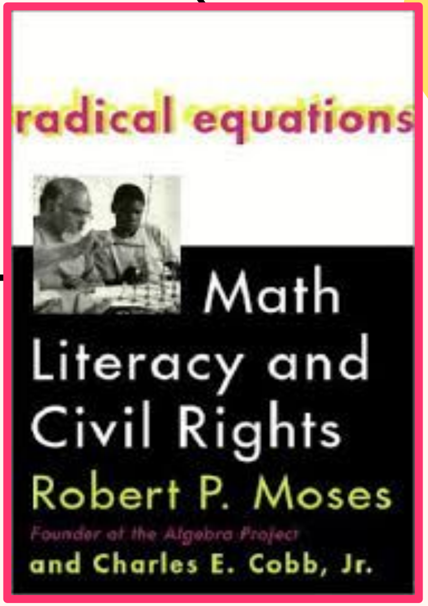
DCPS-4 years
MCPS–27 years

Teacher
Math Content Specialist
Math Resource Teacher
Diversity and Inclusion Coordinator
Secondary Math Instructional Specialist

B.S.-Mathematics
M.Ed.-Curriculum/Instruction
Ed.S.-Educational Leadership
Ed.D.-Educational Leadership

select readers

Math and Equity... Quotes from the book



1 "I believe that the absence of math literacy in urban and rural communities throughout this country is an issue as urgent as the lack of registered Black voters in Mississippi was in 1961." -p. 11

2 "Math literacy and economic access are how we are going to give hope to the young generation" -p. 12

3 "New technology demands a new literacy—higher math skills for everyone, urban and rural. -p. 11

4 "The space for algebra as a civil rights issue is created by nations and institutions now making a global transition from reliance upon technology that primarily organizes physical labor to technologies that directly organize mental labor" -p. 94

Math Literacy from the perspective of Dr. Bob Moses

How do you become a math literacy coach in order to amplify students' mathematical thinking?

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Why Math Literacy?

- Because of the lack of success on standardized tests, students are not showing their proficiency of basic skills, and mathematics education is in crisis mode (Latterell, 2005).
- The National Council of Teachers of Mathematics (2014) acknowledged the impact that reading has on the new math curriculum
- Various studies on reading and mathematics have been conducted. Many of the studies have focused on reading strategies for at-risk students (Adams, 2003; Draper, 2002; Helwig et al., 1999; Kong & Orosco, 2016; McGee, 2019).
- Similarly, there have been articles on mathematics and reading that discuss students and vocabulary strategies (Barnes & Stephens, 2019; Ediger, 2018; Furner et al., 2005; Monroe & Panchyshyn, 1995; Swan, 2018).

Research Study

A Descriptive Qualitative Study on Algebra 1 Teachers' Perceptions of Math Literacy

The research questions are listed below:

RQ1: How do Algebra 1 teachers describe their perceptions of how to increase reading comprehension to support greater understanding of mathematical concepts?

RQ2: How do Algebra 1 teachers describe their perceptions of how to increase vocabulary attainment to support greater understanding of mathematical concepts?

Math Literacy

Constructivist (Bruner)

- real-life situations
- student interests
- infusing stories, games, electronic sources

Cognitive (Vygotsky)

- word walls
- sentence starters
- graphic organizers
- frayer models

Research Study

A Descriptive Qualitative Study on Algebra 1 Teachers' Perceptions of Math Literacy

The six major themes under mathematics literacy in the Algebra 1 classroom are:

Algebra 1 teachers believe that students need to 'speak' Algebra 1 language;

Algebra 1 teachers believe that the use of reading comprehension strategies is the key to student success;

Algebra 1 teachers need to have connections to students by using real-life situations;

Algebra 1 teachers need to be intentional about the use of vocabulary strategies in the classroom;

Algebra 1 teachers need specific staff development for math literacy in vocabulary attainment and reading comprehension;

Algebra 1 teachers need time to plan and work with Professional Learning Communities (PLC) to develop lessons that include vocabulary attainment and reading comprehension.

silent reading

Today's Focus Problem

Mathematics

5 The system of equations shown is graphed in the *xy*–plane.

$$\begin{cases} x + y = 1 \\ 2x - 3y = 17 \end{cases}$$

Determine the coordinates of the solutions of the system algebraically. Then show that your solution is valid. Show your work or explain how you found your answer.

Enter your answer and your work or explanation in the space provided.

Source: MCAP Practice Problems (Algebra 1)

Mathematics

5 The system of equations shown is graphed in the xy–plane.

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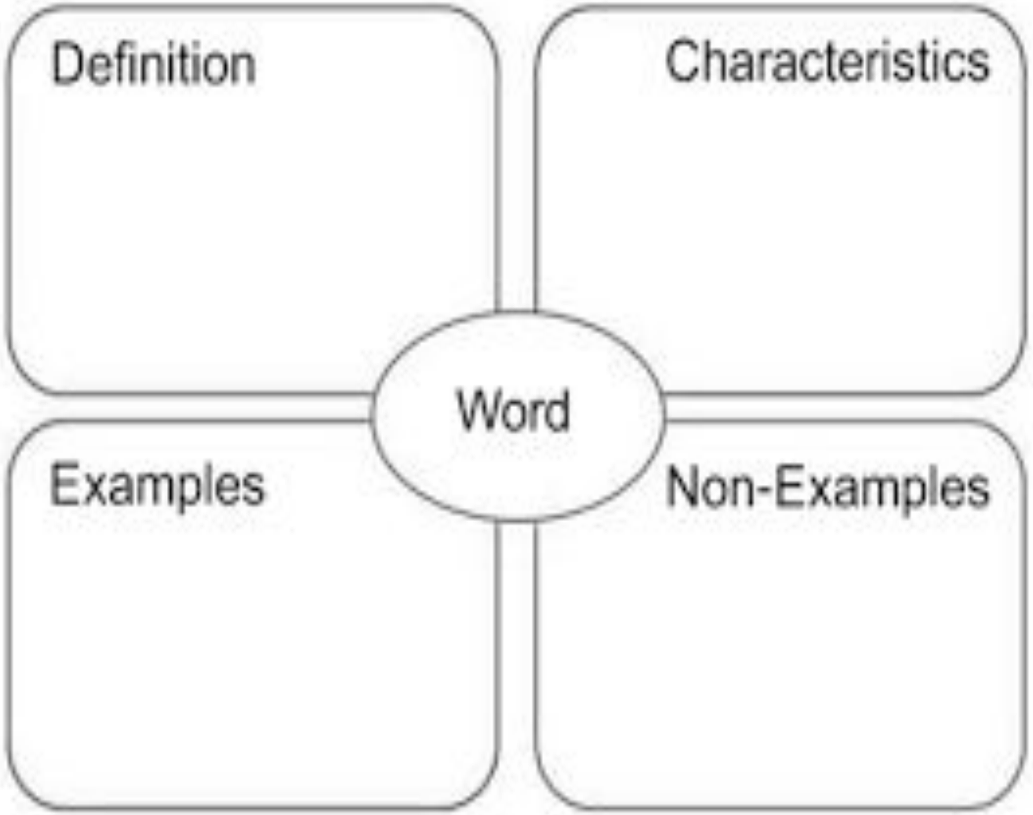
source: MCAP Practice Paper Test, Algebra 1

Word problem:

Sample Sentence Frame:

Word Wall Ideas:



read aloud

Vocabulary Ideas

Provide foldables or graphic organizers

Speak “Algebra”

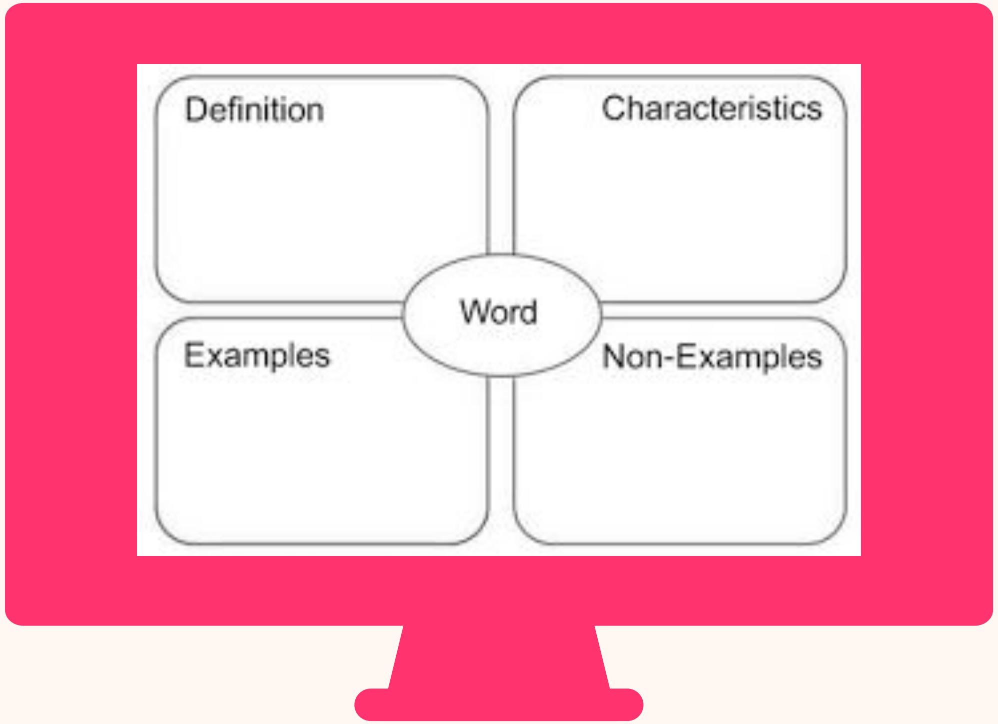
Use Word Walls creatively

“You really have to have a vocabulary list. So, I had a word wall. I use the word wall and I would give it to [students] when they come in and we’re starting a unit. I would give my eight cards to eight different students, create my card, and go and tape it on the wall. This was [the students’] job.”

duo or trio

Vocabulary Focus:

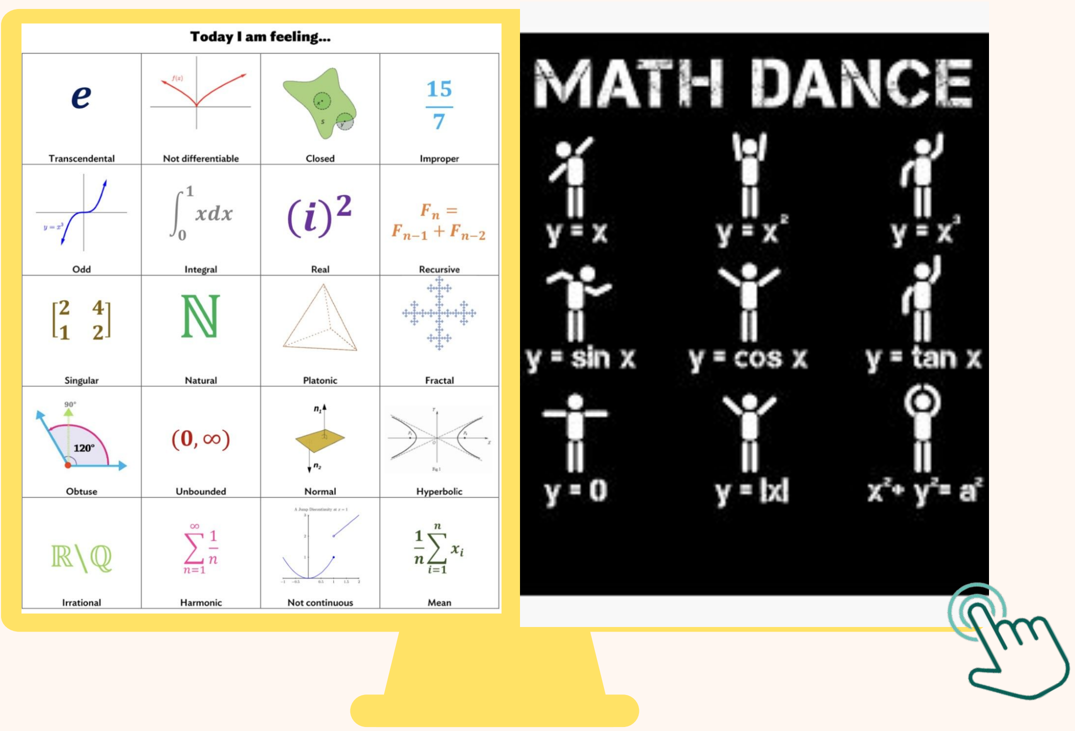
Provide foldables or graphic organizers



whole group

Vocabulary Focus:

Speak "Algebra"



think, pair, share

Vocabulary Focus:

Use Word Walls creatively

read aloud

Comprehension Ideas

Bring Back the Highlighter!

Use Sentence Frames

Have students write relevant word problems

“There’s real value in developing that ability to read, write, and speak mathematics beyond whatever the particular content is.” Similarly, one focus group participant noted, “I think math is a language that you can learn. Once you understand it, you can see it in everyday life.”

duo or trio

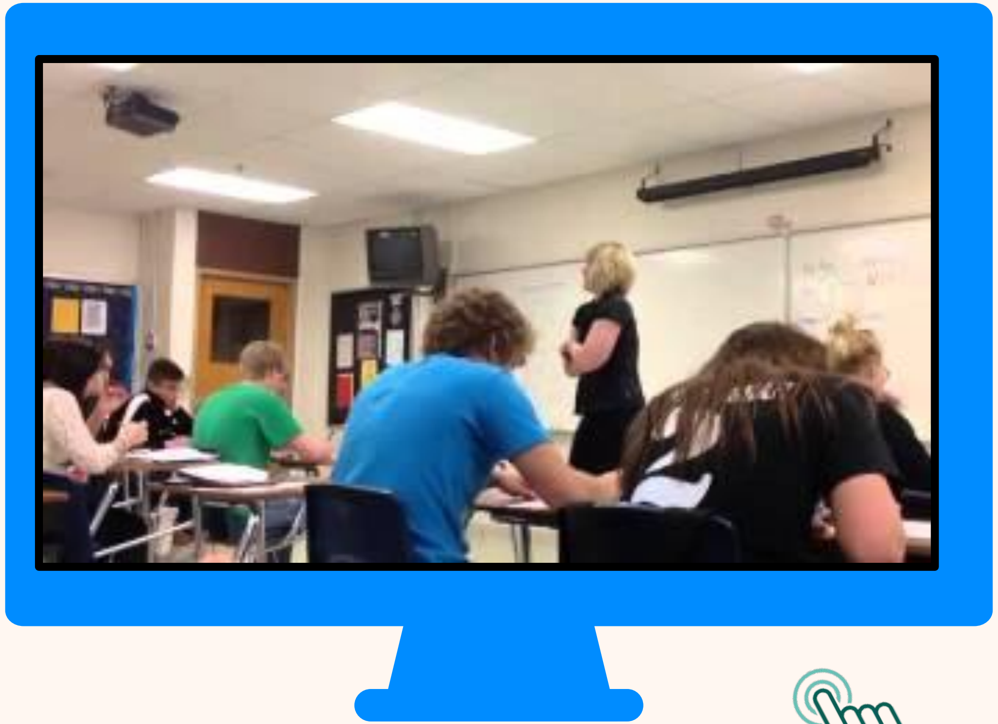
Comprehension Focus:

Bring Back the Highlighter!

source: Enriching Young Minds and Hearts

Comprehension Focus:

Use Sentence Frames



source: Academic LIteracy Project

choice

Comprehension Focus:

Have students write relevant word problems

[Google Form for Student Interests]

[MCAP Practice Problems]

EXIT Card: Create you own problems

tech share

How do you become a math literacy coach in order to amplify students' mathematical thinking?

Questions & Comments

How do I infuse this in my Algebra 1 classroom if I have a mandated curriculum and a major test at the end of the year?

What is the best way to get more professional development in infusing math literacy strategies?

Thanks!

Do you have any questions?

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LinkedIn: Celita Lewis-Davis, Ed.D.

Resources

Enderson, M. & Colwell, J. (2021). Considering possibilities to promote disciplinary literacy instruction in mathematics. *Journal of Adolescent & Adult Literacy, 64*(6), 683-692.

Furner, J., Yahya, N. & Duffy, M. (2005). Teach mathematics: strategies to reach all students. *Intervention in School & Clinic*. *41*(1), 16-23.

Ippolito, J., Dobbs, C. & Charner-Laird, M. (2017). What literacy means in math class. *The Learning Professional*. 38(2).

Kercood, S. & Grskovic, J. (2009, May). The effects of highlighting on the math computation performance and off-task behavior of students with attention problems. *Education and Treatment of Children*, 231-241.

Lewis-Davis, C. (2022). A descriptive qualitative study on Algebra 1 teachers' perceptions of math literacy. (Published Doctoral Study). Trident University, Cypress, CA.

Lewis-Davis, C. (2024, March 11). Six Ways to Improve Students' Math LIteracy. *https://www.edutopia.org/article/improving-students-math-literacy-middle-high-school*

Moses, R., & Cobb, C. (2001). Radical equations: Civil rights from mississippi to the algebra


DONE

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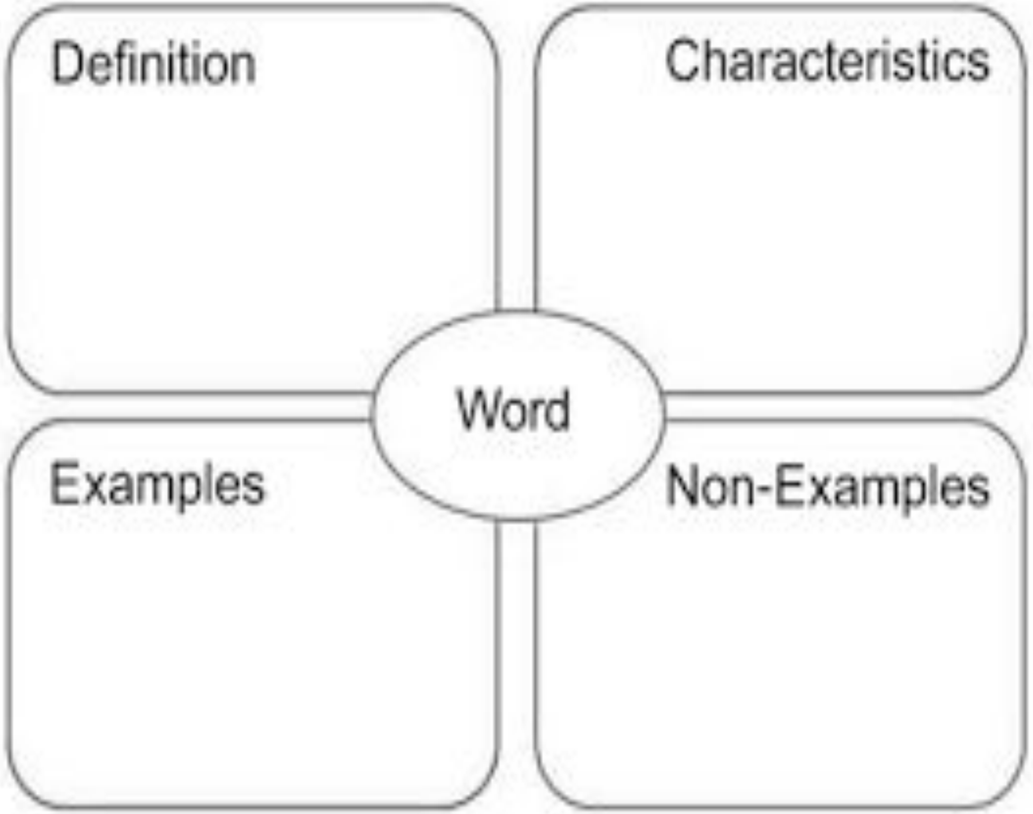

Presentation Info

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