Using Discourse Strategies to Promote Student Voice, Agency and Mathematical Thinking

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INTRODUCTIONS

HELLOS + WELCOME

SESSION OBJECTIVES

Use a workshop model to:

- Examine how language and discourse create (in)equitable spaces for students
- Become familiar with six of the ten ‘Discourse Strategies’ (DS) through the lens of access and equity
- Determine how DS build student mathematical identity and sense of belonging in the math class
- Practice embedding the DS into rich tasks

LET'S DO SOME MATH

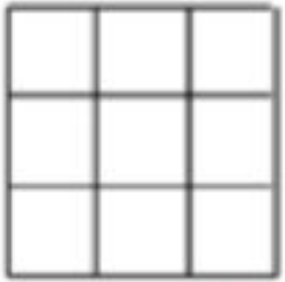
Playing with Colors and Tiles

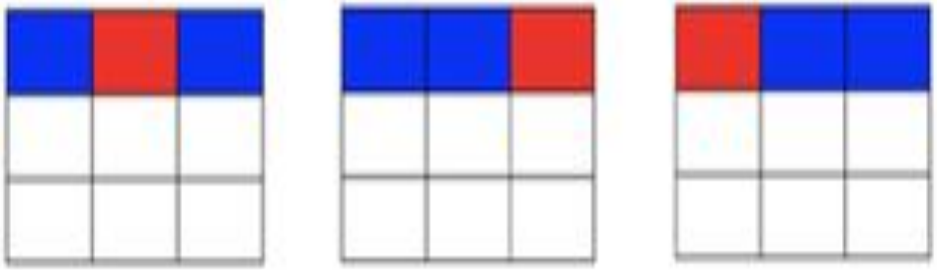
THE COLOR SQUARE GAME

The puzzle must contain 3 red tiles, 3 blue tiles, and 3 green tiles

All tiles of the same color must be *contiguous* (share a side)

Complete as much of this color square as you can from the clues given.





Is there a unique solution to this problem? If so, explain why it is unique. If not, how many solutions exist?

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How did you use your reasoning skills to solve this puzzle?

In what ways did your tablemates support you as a learner?

TURN & TALK

What communication strategies did your group use that either promoted or hindered your group's ability to solve the problem? (i.e; one voice, interrupting, etc.)

What, if any, is the connection between problem – solving in mathematics and equity in mathematics?

WHY DISCOURSE?

(In)Equity in Mathematics

EFFECTIVE MATHEMATICS TEACHING PRACTICES

1. Establish mathematics **goals** to focus learning.
2. Implement **tasks** that promote reasoning and problem solving.
3. Use and connect mathematical **representations.**
4. Facilitate meaningful mathematical **discourse**.
5. Pose purposeful **questions**.
6. Build **procedural fluency** from conceptual understanding.
7. Support **productive struggle** in learning mathematics.
8. **Elicit and use evidence** of student thinking.

NCTM

MATHEMATICAL IDENTITY + BELONGINGNESS

Mathematics Identity includes:

- beliefs about one's self as a mathematics learner;
- one's perceptions of how others perceive him or her as a mathematics learner,
- beliefs about the nature of mathematics,
- engagement in mathematics, and
- perception of self as a potential participant in mathematics (Solomon, 2009).

What is belonging in math?

Psychological, sociological, and educational research has shown that students' positive perceptions of ***belonging*** in school is related to healthy school outcomes: academic motivation; achievement; mental and physical health; college GPA; and educational aspirations, among many others.

DISCOURSE STRATEGY FRAMEWORK

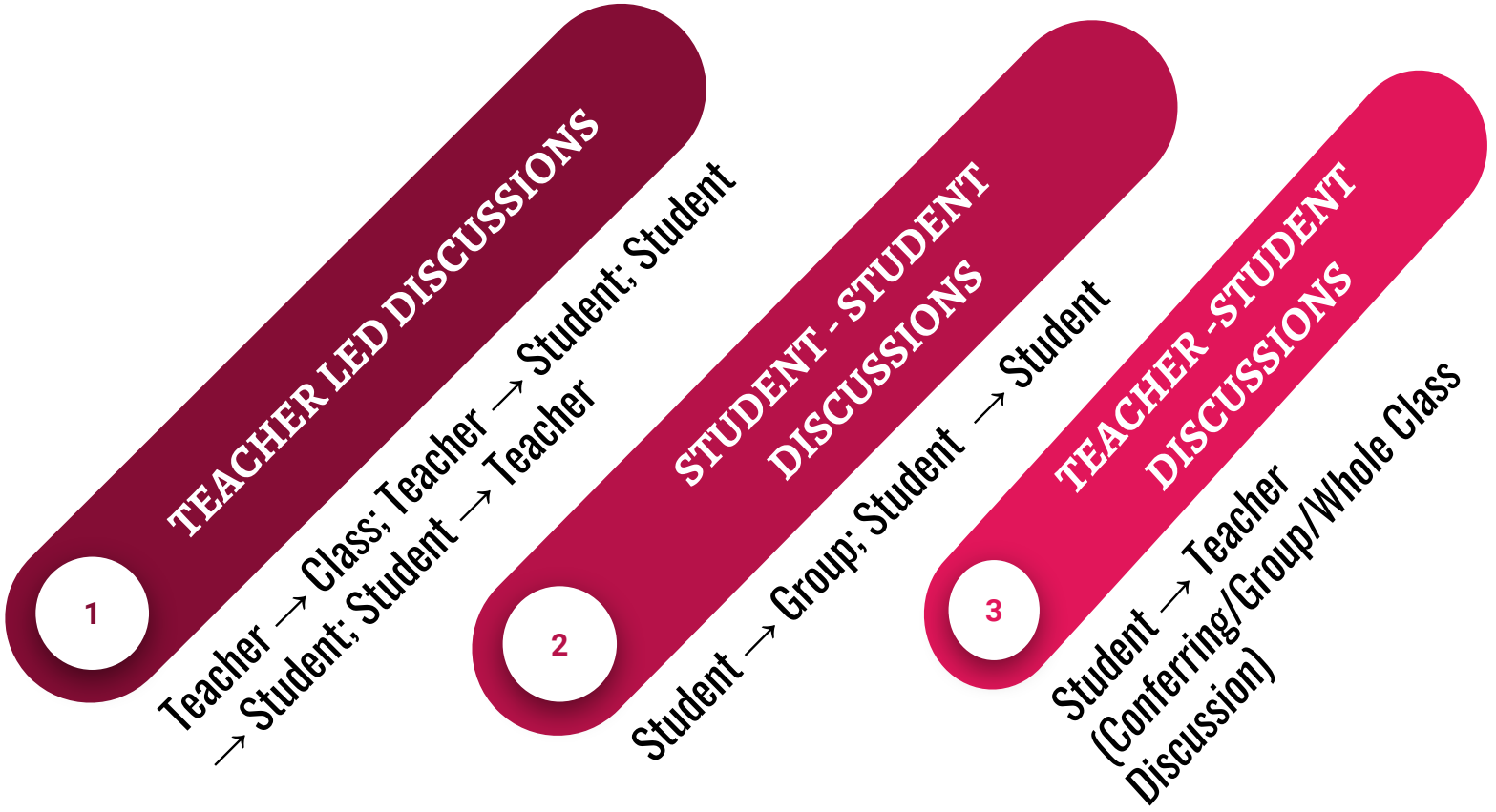
Instructional Strategies to Support All Mathematical Learners

*"Language, **through implicit and explicit action,** is the medium of mathematical development and the medium through which equity and inequities are structured and sustained." (Herbel-Eisenmann, Choppin, Wagner, Pimm, 2011)*

WHY?

Language + Discourse + (In)Equity in Mathematics

THREE PRONGS OF STUDENT DISCOURSE



DISCOURSE STRATEGIES

The 10

Will experience today	Will NOT experience today
I Notice... I Wonder...	Would You Rather?
Which One Doesn't Belong?	Define & Clarify
Fraction Talks	Graphing Stories
If I Only Had One Question	Interactive Think Aloud
Fermi Questions	
Always, Sometimes, Never	

TWO LEVELS OF DISCOURSE IN MATH

DISCOURSE STRATEGIES

Discourse Strategies are intentional teacher moves designed to promote equitable mathematical instructional practices.

They promote student-centered classrooms by giving students daily opportunities to experience rich mathematics by creating viable mathematical arguments, critiquing the reasoning of others and reasoning abstractly and quantitatively.

DISCOURSE STRATEGIES FRAMEWORK

The 'Discourse Strategies Framework' structures HOW, WHEN and WITH WHOM teachers decide to use chosen strategies to meet the needs of all learners.

It supports teachers in making equity-based decisions throughout the planning, implementation and reflection process.

01	Automatic Language Literate Language	• Everyday language • Often about concepts, and is less concrete
02	Concrete Language Abstract Language	• Describes our senses • Describes ideas such as sportsmanship, irony, and symbolism
03	Basic Language Higher language	• Practical and to the point • Abstract, symbolic, inferential- it is the language we use to learn
04	Receptive Language Active Language	• Used to understand verbal or written communication • The ability to translate ideas into your own words

ENGAGING WITH THE DISCOURSE STRATEGIES

“I Notice, I Wonder”	“Which One Doesn’t Belong”
“Always, Sometimes, Never”	“If I Only Had One Question”
“Fraction Talks”	“Fermi Questions”

Use the given graphic organizers to explore a sampling of the DS

SHARING OUR EXPERIENCES WITH THE DISCOURSE STRATEGIES

Share some highlights working with your given Discourse Strategy.

Be sure to include the name of the strategy, a brief summary of the strategy and some ways you may use it.

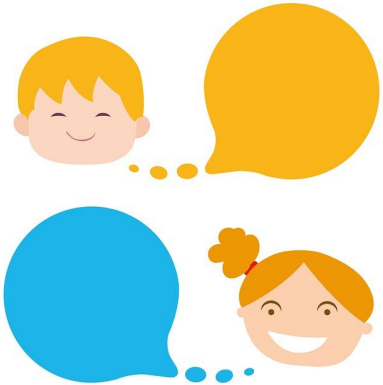
EMBEDDING THE DISCOURSE STRATEGIES INTO RICH TASKS

Find a new partner.

Use the ‘King’s Dilemma’ and the graphic organizer to practice using a chosen Discourse Strategy.

LET'S REMEMBER...

Mathematical Discourse should give access to all learners by:



- Building on and honoring students' thinking
- Letting students share ideas, clarifying understandings, and developing convincing arguments
- Engaging students in analyzing and comparing student approaches
- Advancing the math learning of the whole class

What pedagogical moves did you see and/or engage in today that are instrumental in creating an equitable mathematics classroom?

What are some ideas/strategies you will “walk away” with?

NO Es

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I got on a magic train this morning...

QUESTIONS?

Thank You!

Keep in Touch - Contact us...

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