Learning is not a Spectator Sport

Constructing Meaningful Talk in the Math Classroom

Think Deeply

Question Mathematically

Do more than what is expected

2 player game Directions: Choose one player to use a O, the other will use an X.

Players take turns to select one, two or three pebbles (player choice). After all the pebbles have been selected, the winner is the one with an odd number of pebbles.

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ENROLLMENT AND DEMOGRAPHICS	Grades K - 3	Grades 4 - 5	Grades 6 - 8	Grades 9 - 12
Total Enrollment	3,238	1,696	2,358	3,036
Regular Attenders	84.2%	86.2%	83.6%	71.3%
Economically Disadvantaged	77%	77%	75%	74%
Students with Disabilities	11%	11%	13%	11%
Ever English Learners	39%	43%	47%	48%
Different Languages Spoken	43	41	41	45
Mobile Students	16.3%	13.8%	15.3%	15.2%

Can you promise that you will win if it is your turn and there are 3 left?

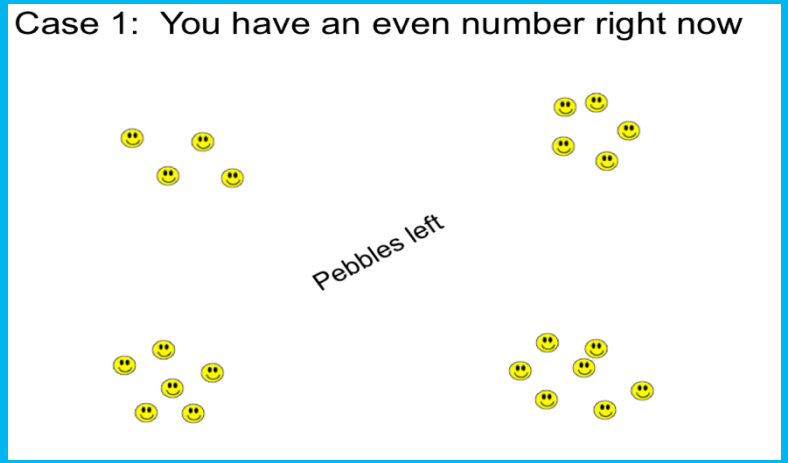
Does it matter whether you already have an even or odd number of pebbles?

Can you promise a win when it is your turn and there are four pebbles?

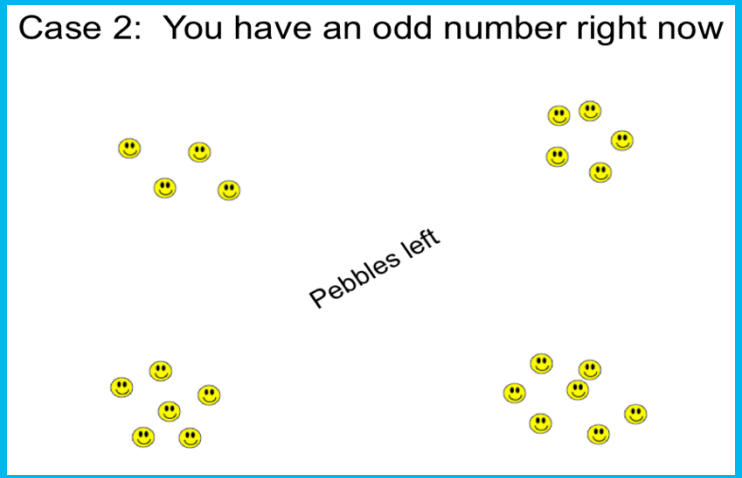
If you already have an even number?
How do you know?

If you already have an odd number?
How do you know?

Can you promise a win when it is your turn and...



- Private think time
- Discuss/share thinking
- Be prepared to share w/ group



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.

East Metro Mathematics Leadership (EaMML) Project

A collaboration aimed to improve mathematics teaching by developing a cadre of preK-12 teacher leaders that consistently use research-informed instructional practices in support of student mathematics learning and take leadership in sharing that professional learning.

DAVID DOUGLAS SCHOOL DISTRICT

Centennial SCHOOL DISTRICT

mesd Multnomah Education Service District

Portland State UNIVERSITY

RMC RESEARCH

Student Achievement Data

Mathematics Smarter Balanced Assessment (SBA)

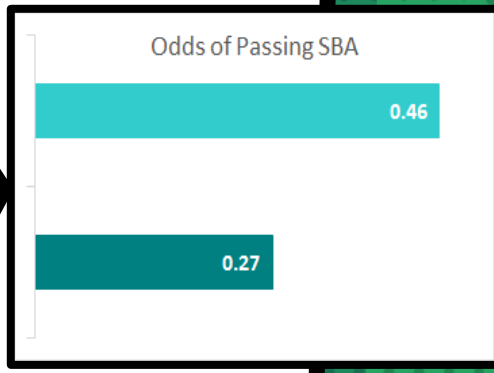
HLM Results: Growth Model

EaMML-taught (Tx) students experienced ***significantly greater*** growth (+7.81 points/yr) than comparison students.

EaMML Effect

Among student who did not meet the standards on the SBA in 2015…

EaMML (Treatment) students were nearly twice as likely to meet the standards *in subsequent years than* **comparison students.**



HLM Results: Equity Model

The positive EaMML Effect was ***consistent*** across student demographic subgroups:

- Socioeconomic status (FRL, non-FRL)
- Ethnicity (Hispanic, non-Hispanic)
- Race (White, non-White)
- Gender

Much of the focus of the grant?

Increasing student engagement and discourse

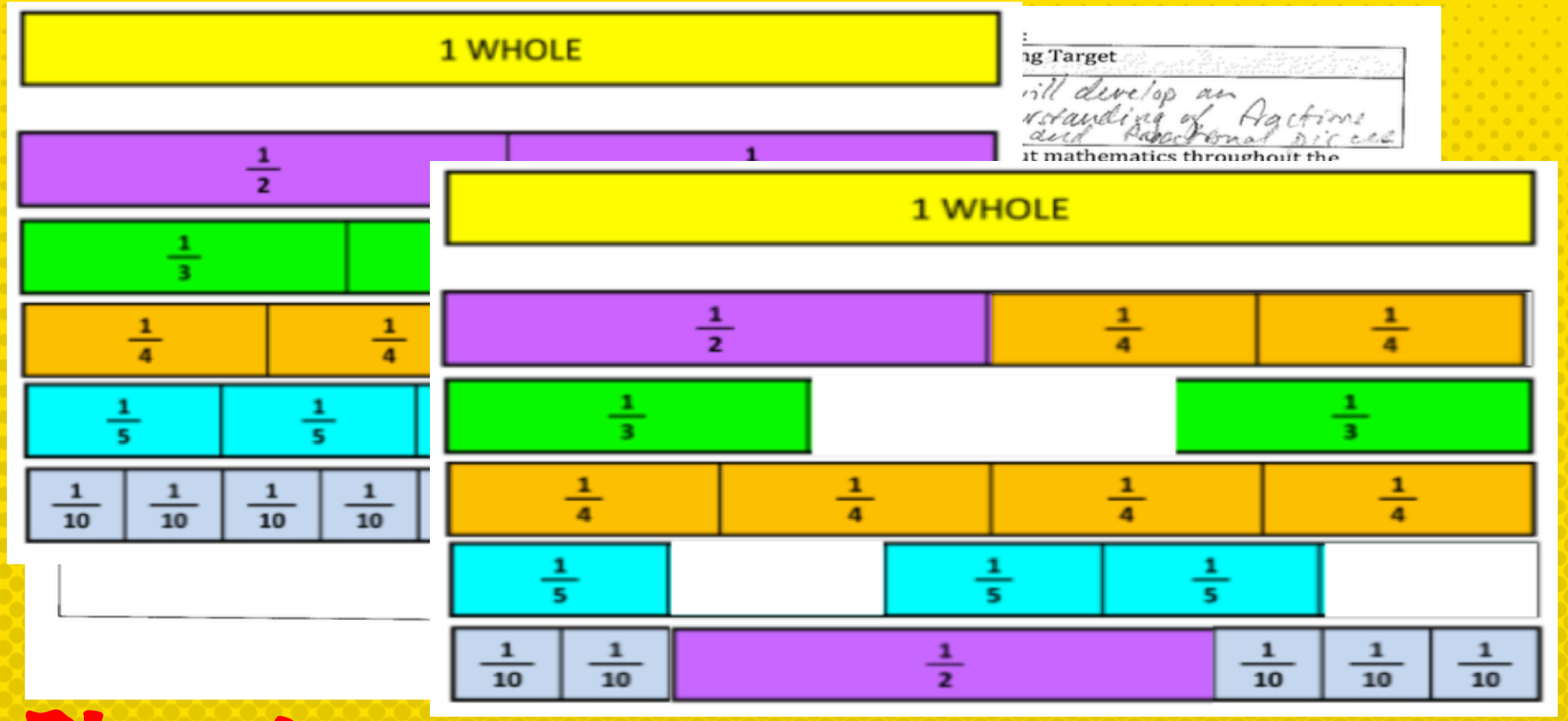
How am I mindful of increasing student engagement and discourse?

It's all in the Planning!

Partners

Partners

Whole Group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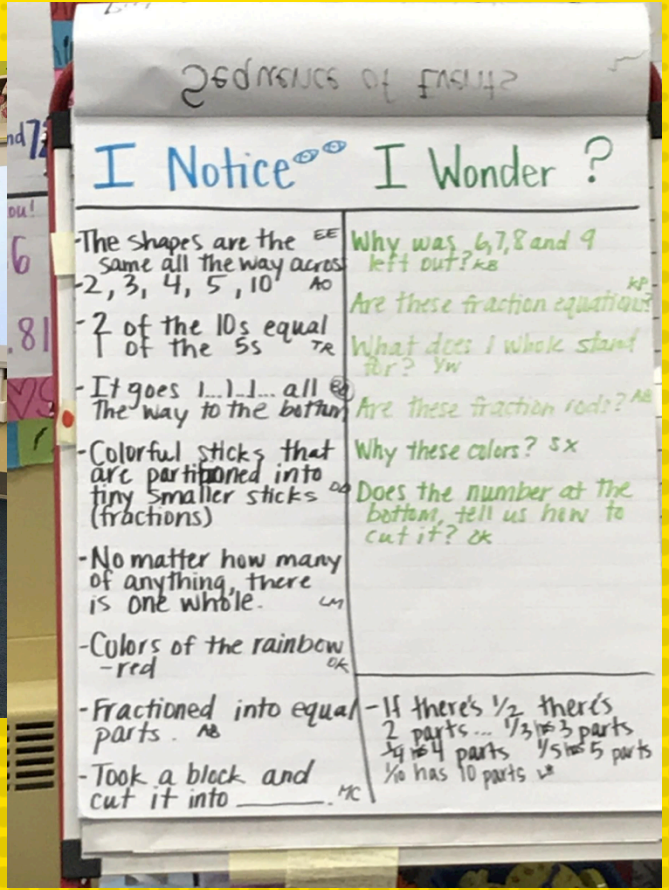
Planning


Aa Bb Cc Dd Ee Ff Gg
March
I Notice I Wonder ?


I Notice I Wonder ?
-The shapes are the same all the way across -2, 3, 4, 5, 10 AO
-2 of the 10s equal 1 of the 5s TR
-It goes 1...1-1... all the way to the bottom
-Colorful sticks that are partitioned into tiny smaller sticks (fractions) DO
-No matter how many of anything, there is one whole. LM
-Colors of the rainbow -red OK
-Fractioned into equal parts. AB
-Took a block and cut it into _____. MC
Why was 6, 7, 8 and 9 left out? KB
Are these fraction equations? KP
What does 1 whole stand for? YW
Are these fraction rods? AB
Why these colors? SX
Does the number at the bottom, tell us how to cut it? CK
-If there's 1/2 there's 2 parts... 1/3 has 3 parts 1/4 has 4 parts 1/5 has 5 parts 1/10 has 10 parts LB

Launch

Summarize

I found that one hexagon is equal to two trapezoids…

…but I also think one hexagon is equal to six triangles…

…that means one trapezoid is equal to three triangles.

Summarize

One triangle is half of the trapezoid.

Teacher: What else is half?

One trapezoid is half of the hexagon.

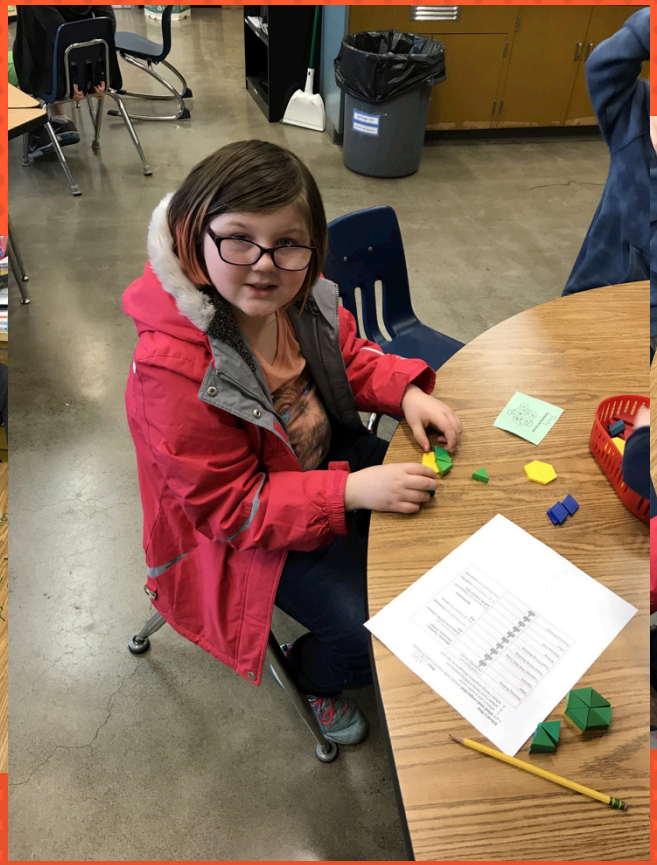
So the halves are not the same, but they are half of the picture.

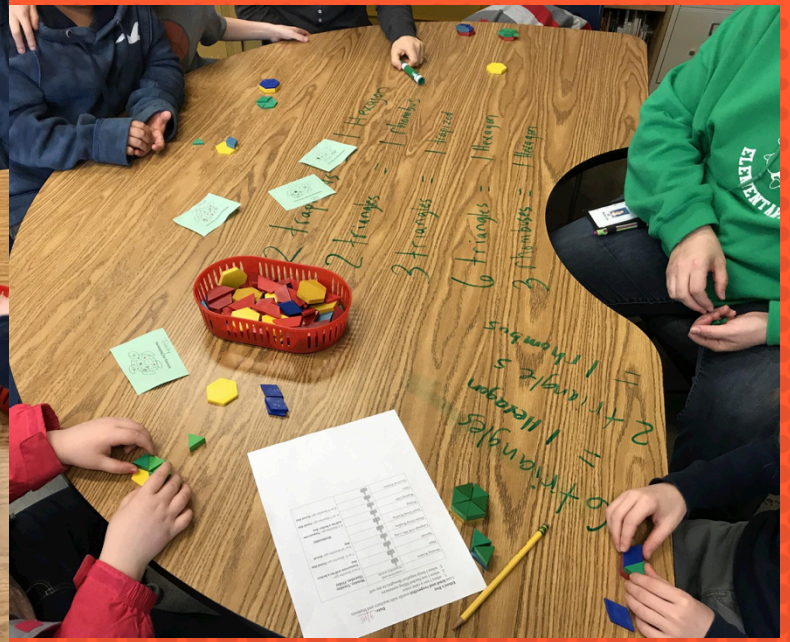
Teacher: You mean the figure?

Yes, the figure.

Small Group

Explore




2 triangles = 1 rhombus
3 triangles = 1 trapezoid
6 triangles = 1 hexagon

Small Group

Summarize

How can I incorporate or adapt any part of this for my class?

Launch • Explore • Summarize

603: Saturday (9:30 – 10:30)

Strategies to Implement
Problem-Based Lessons

Walter E Washington CC, 204 C

Questions?

Doing Math Is ...

Analyzing, **B**uilding, **C**lassifying,
Designing, **E**stimating, **F**ormulating,
Generalizing, **H**ypothesizing, **I**nvestigating,
Justifying, **K**nowing, **L**isting, **M**odeling,
Numbering, **O**rganizing, **P**atterns,
Questioning, **R**epresenting, **S**ubstituting,
Testing, **U**ncovering, **V**isualizing,
Wondering, e**X**plaining, asking wh**Y**,
Zipping through mental calculations

Launch ••• Explore ••• Summarize

Either at a large scale...or mini - scales within each lesson. The launch and explore have lots of intentional discourse, is often teacher directed at some point but not teacher focused, and the summarize is done with an emphasis on the learning target and the teacher takes a leading role in bringing things together.

THANKS!

Comments and Questions?

You can find us at

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