Developing Mathematical Language for the ELL Student

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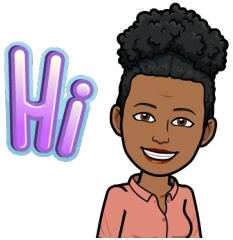
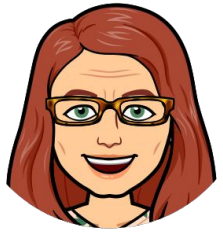


Introductions



Marlene Collins, NBCT		Linda Lichter Sumita, NBCT
14 Year Veteran		14 Year Veteran
North Palos School District 117 in Palos Park, IL		Chicago Public Schools
Math and Science Team Leader		Middle School Math Teacher
70% of the students in my district speak a language other than English		81% Asian students with 31% considered Limited English

Goals

(Learning Intentions)

1. To share strategies that support language development and math achievement

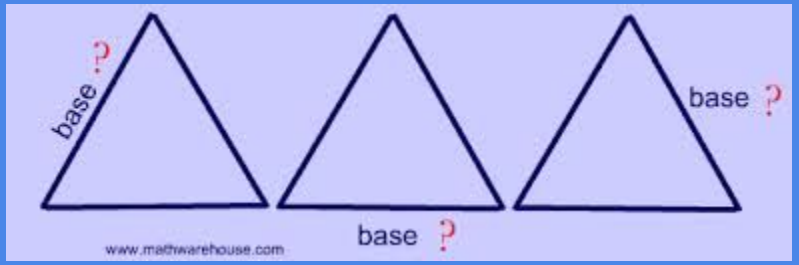
2. To share the importance and rationale for including these strategies

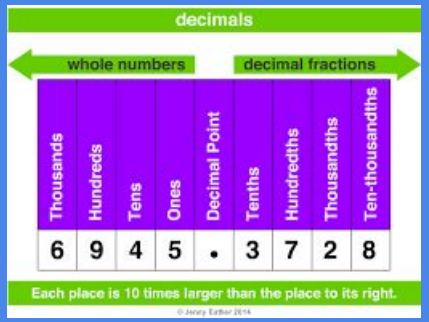
Let's Get Started!

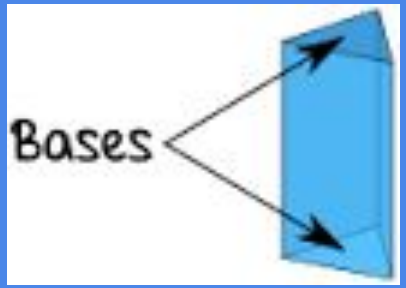
Really--Base?

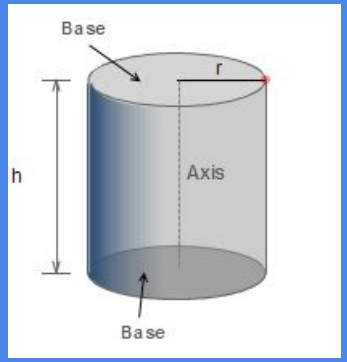
- The basis of
- My headquarters
- Really vile
- Acid vs. base (pH)
- That thing that ballplayers run to
- And don't forget bass guitar

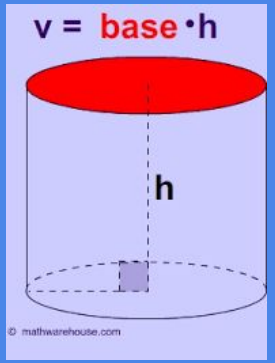
But I'm Talking Math!

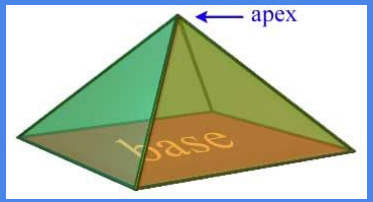

base ?
base ?
base ?
www.mathwarehouse.com

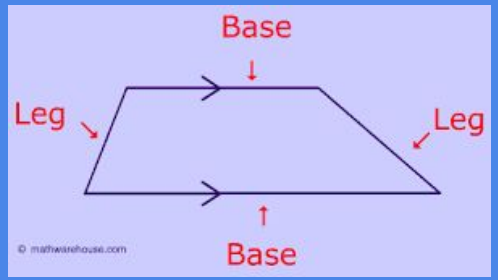

decimals
whole numbers
decimal fractions
Thousands
Hundreds
Tens
Ones
Decimal Point
Tenths
Hundredths
Thousandths
Ten-thousandths
6 9 4 5 . 3 7 2 8
Each place is 10 times larger than the place to its right.

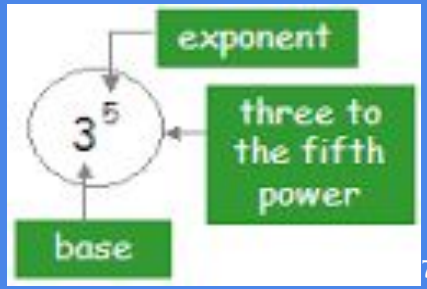

Bases


Base
r
h
Axis
Base


v = base • h
h
© mathwarehouse.com


apex
base


Base
Leg
Leg
Base
© mathwarehouse.com


exponent
3 5
three to the fifth power
base

Imagine...

- Being a student whose first language is not English
- You've transitioned out of your bilingual classroom or it's your first year in an American school
- Your teacher does not speak your language

Vocabulary Strategies

Math Yappers

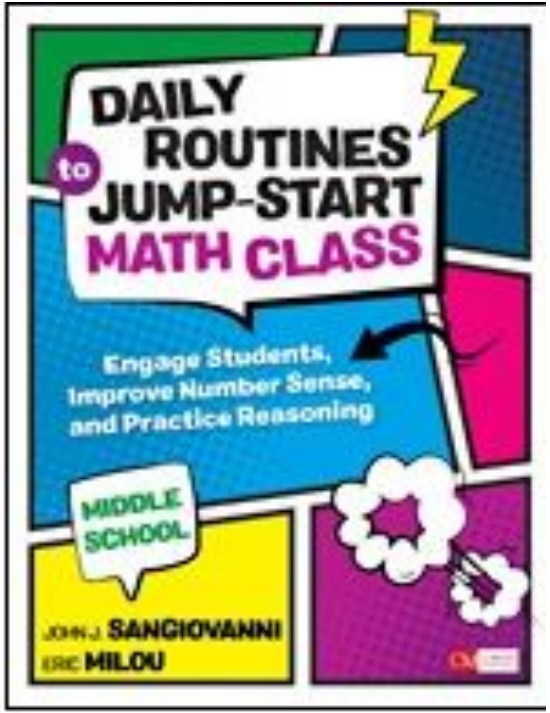
1. Area
2. Perimeter
3. Square

Math Yappers

1. Expression
2. Factor
3. Median

A Lively Classroom

Math Yappers

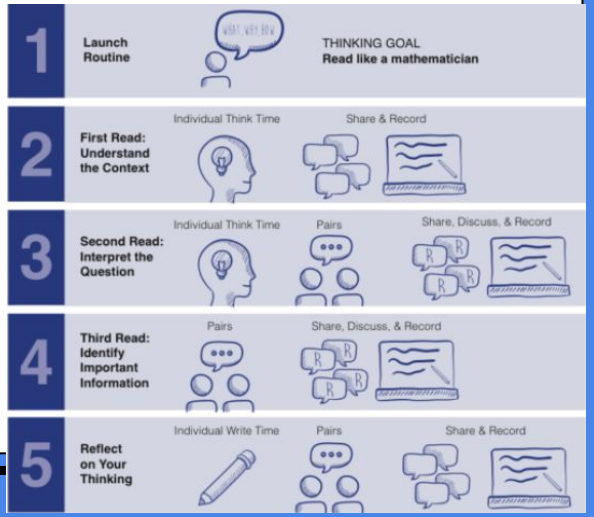


Reading Strategies

Three Reads Strategy (my variation!)

Let *a* = any rational number. Is the absolute value of *a* different if *a* is a positive number or a negative number?

Explain.



Collaborative Strategies

Sage 'N Scribe

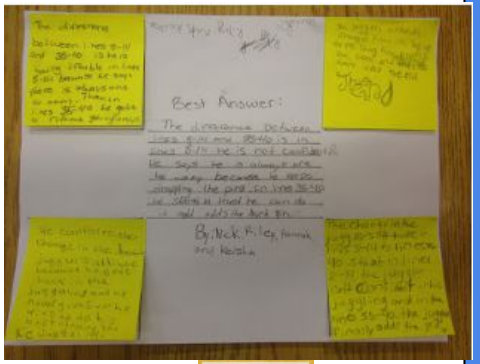
In pairs, Person A is the Sage; Person B is the Scribe.

- The Sage gives the Scribe step-by-step instructions how to perform a task or solve a problem.
- The Scribe records the Sage's **solution** step-by-step in writing/typing, coaching if necessary
- The roles reverse and the Sage becomes the Scribe
  And the Scribe becomes the Sage.

Collaborative Problem Solving

- Students solve the problem independently.
- Students collaborate with a partner or group to create the best solution to the problem.

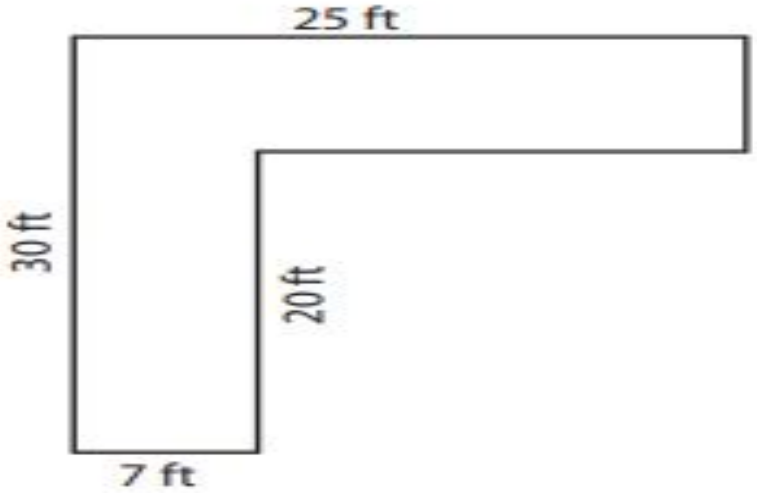
Benefits: Students get to first work independently to clarify their own understanding then share their understandings with other to determine a complete solution.



SHOWDOWN

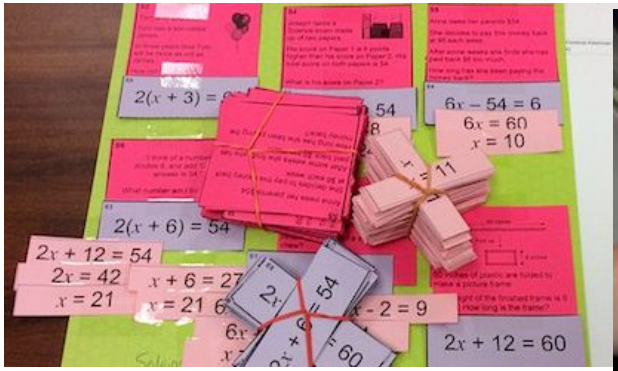
What are the length and width of a rectangle with an area of 24 square feet and a perimeter of 22 feet?

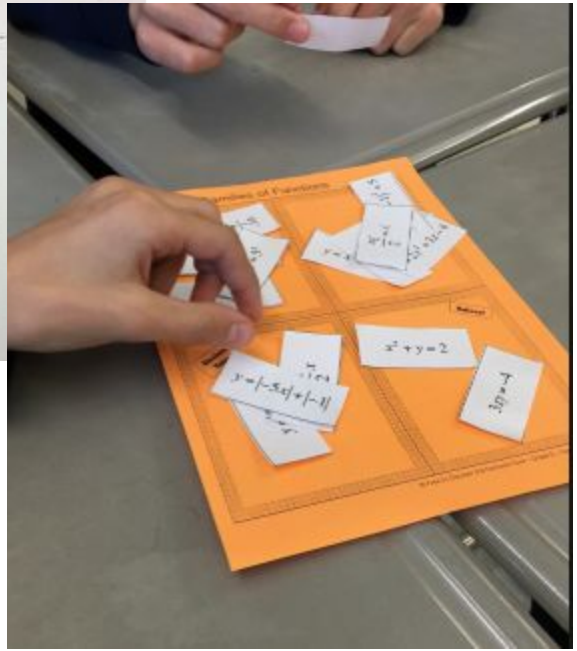
SHOWDOWN



Area = _____

Card Sorts



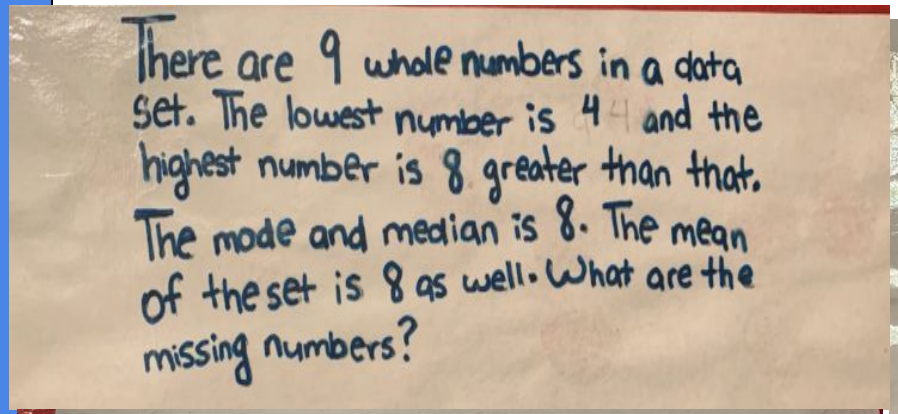


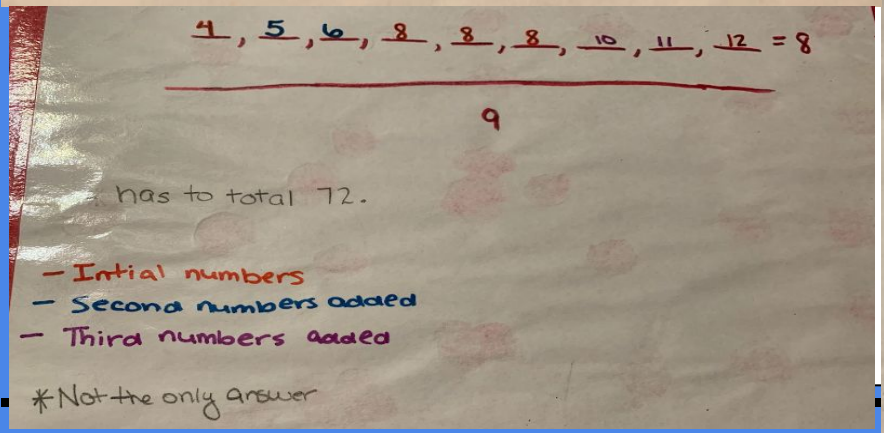
Benefits of Card Sorts

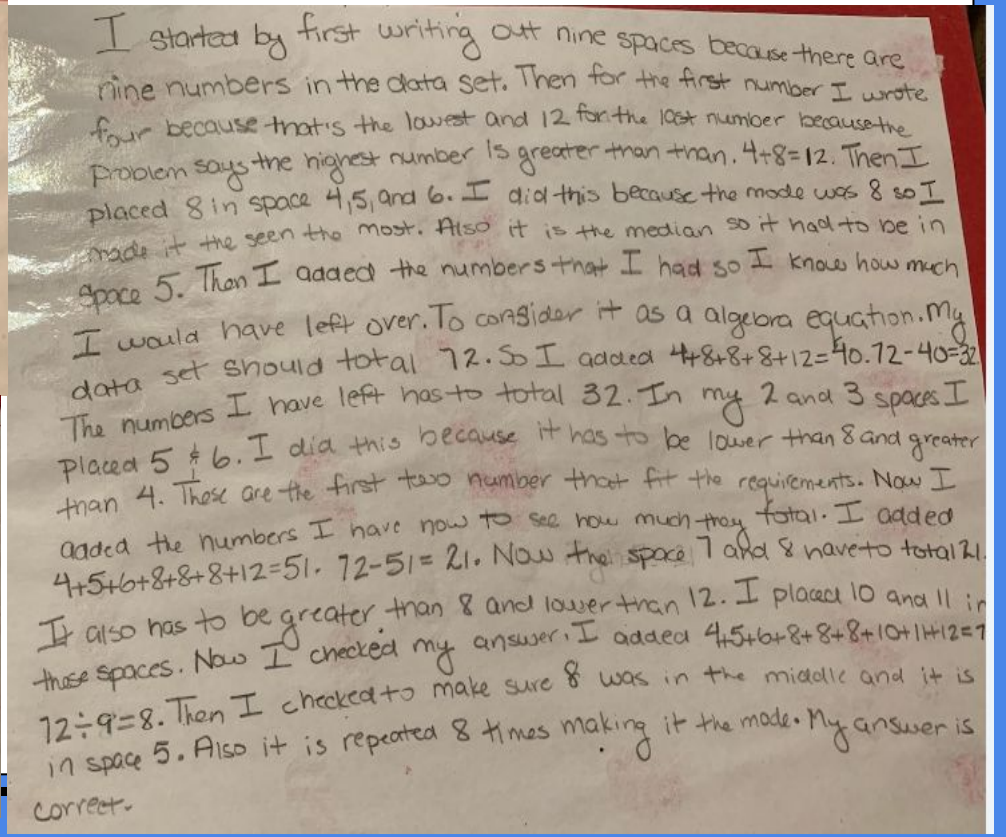
1. Promote discourse
2. Requires categorization/ higher order thinking skills
3. Allows students relate various representations

Writing

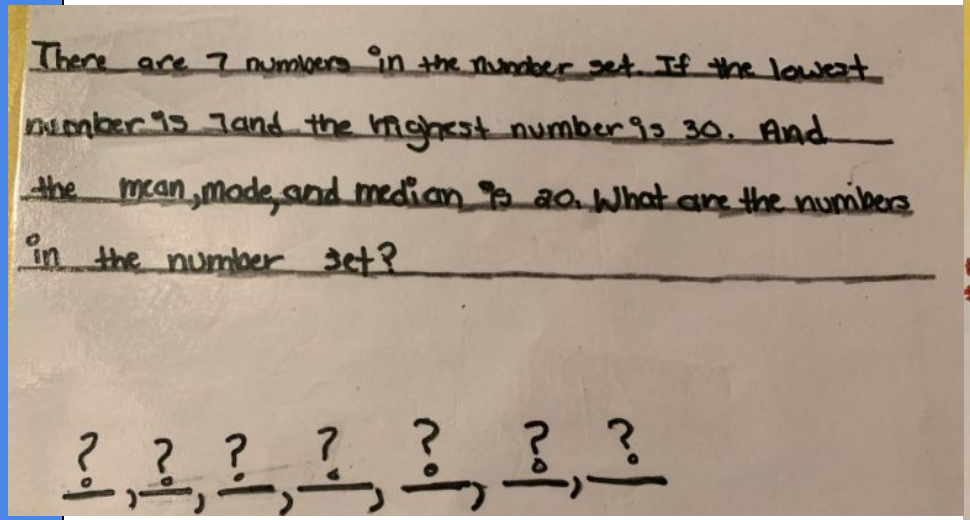
Student Created Problems

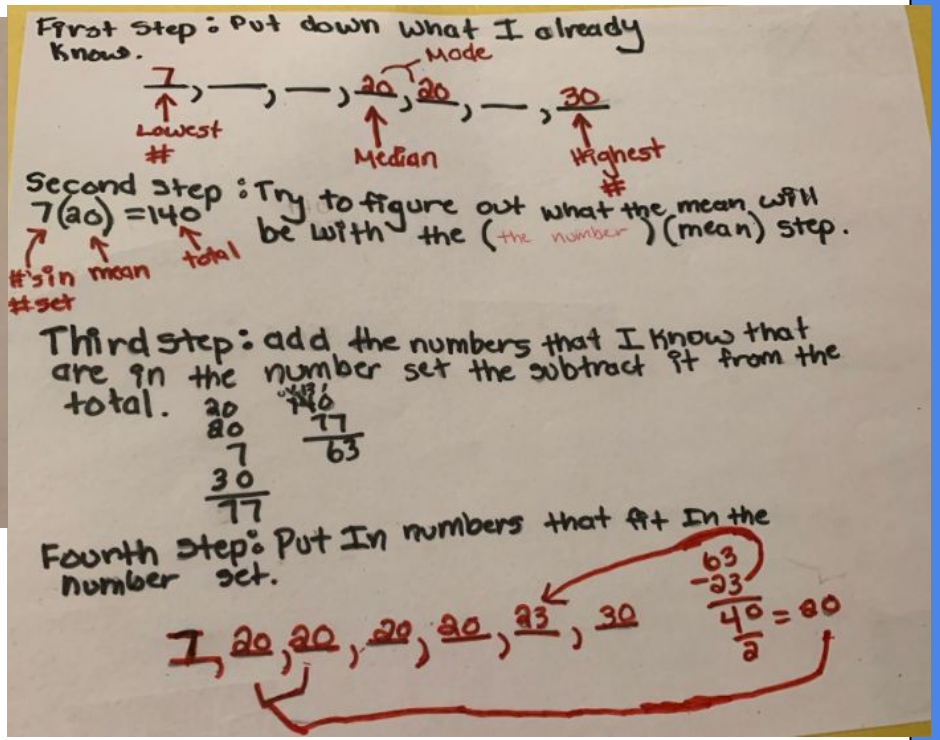




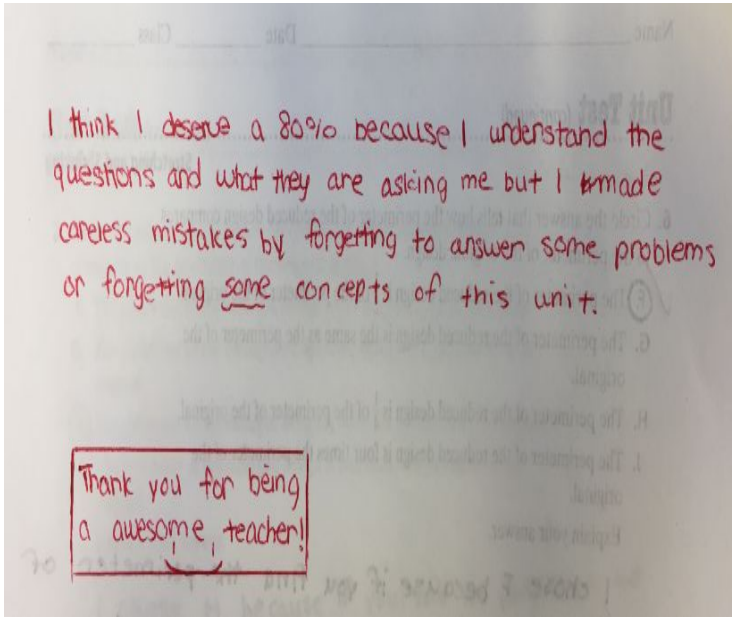


Student Created Problems

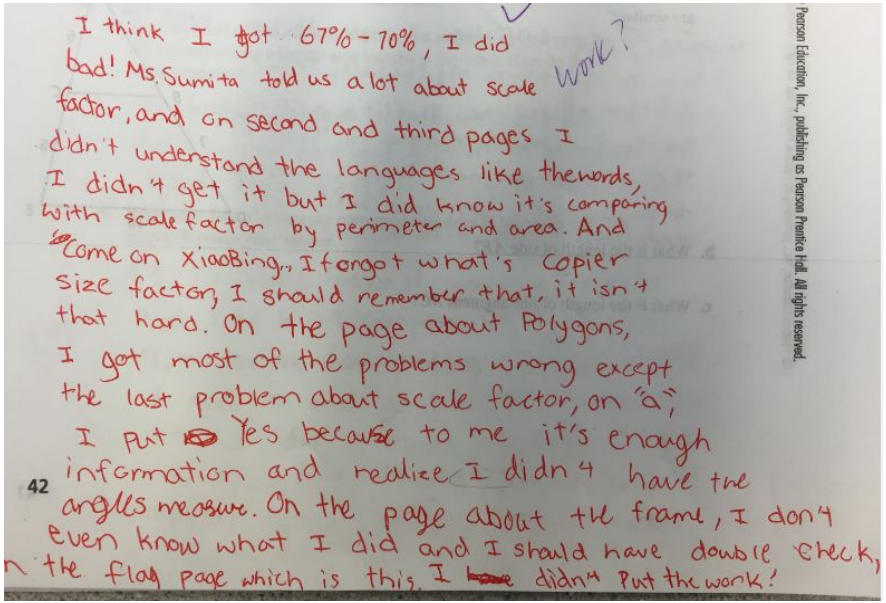




Student Reflection and Metacognition


I think I deserve a 80% because I understand the questions and what they are asking me but I ~~m~~made careless mistakes by forgetting to answer some problems or forgetting some concepts of this unit.

Thank you for being a awesome, teacher!


I think I got 67% - 70%, I did bad! Ms. Sumita told us a lot about scale factor, and on second and third pages I didn't understand the languages like the words, I didn't get it but I did know it's comparing with scale factor by perimeter and area. And Come on XiaoBing., I forgot what's copier size factor, I should remember that, it isn't that hard. On the page about Polygons, I got most of the problems wrong except the last problem about scale factor, on "a", I put ~~No~~ Yes because to me it's enough information and realize I didn't have the angles measure. On the page about the frame, I don't even know what I did and I should have double check, on the flag page which is this, I ~~have~~ didn't put the work!

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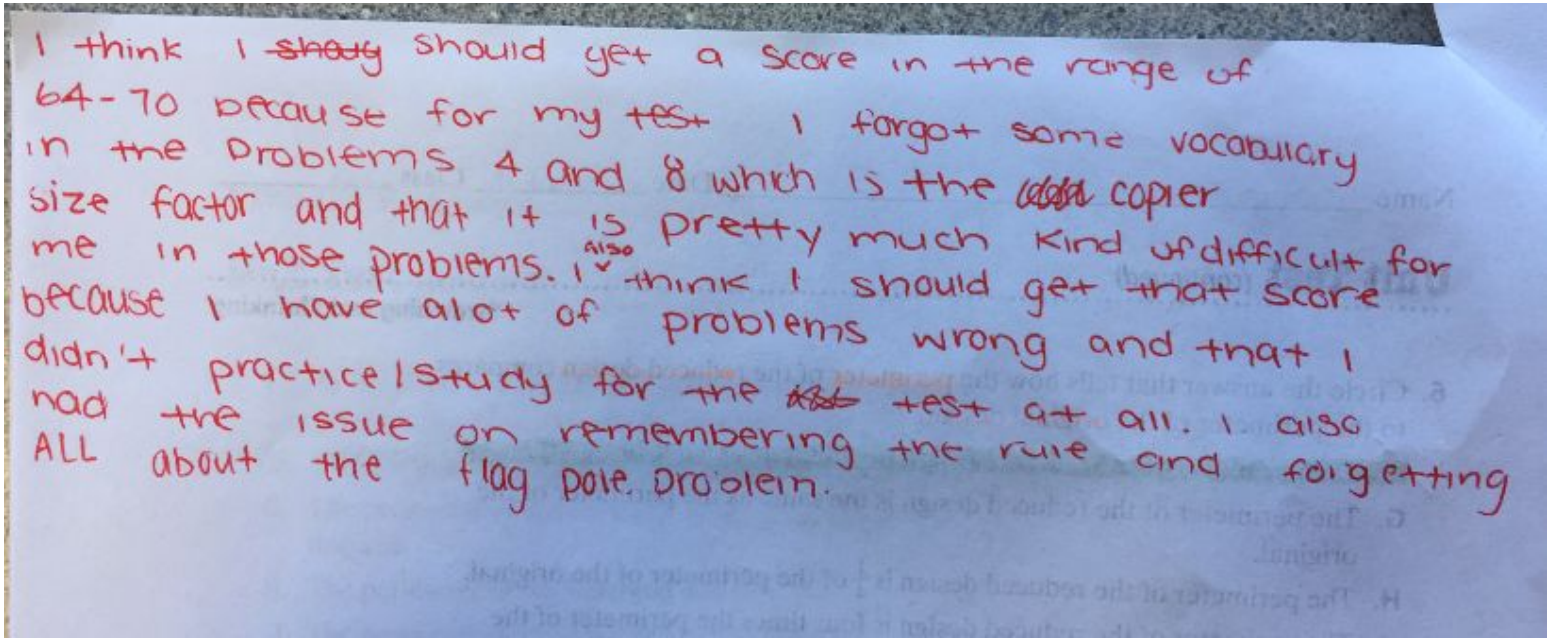
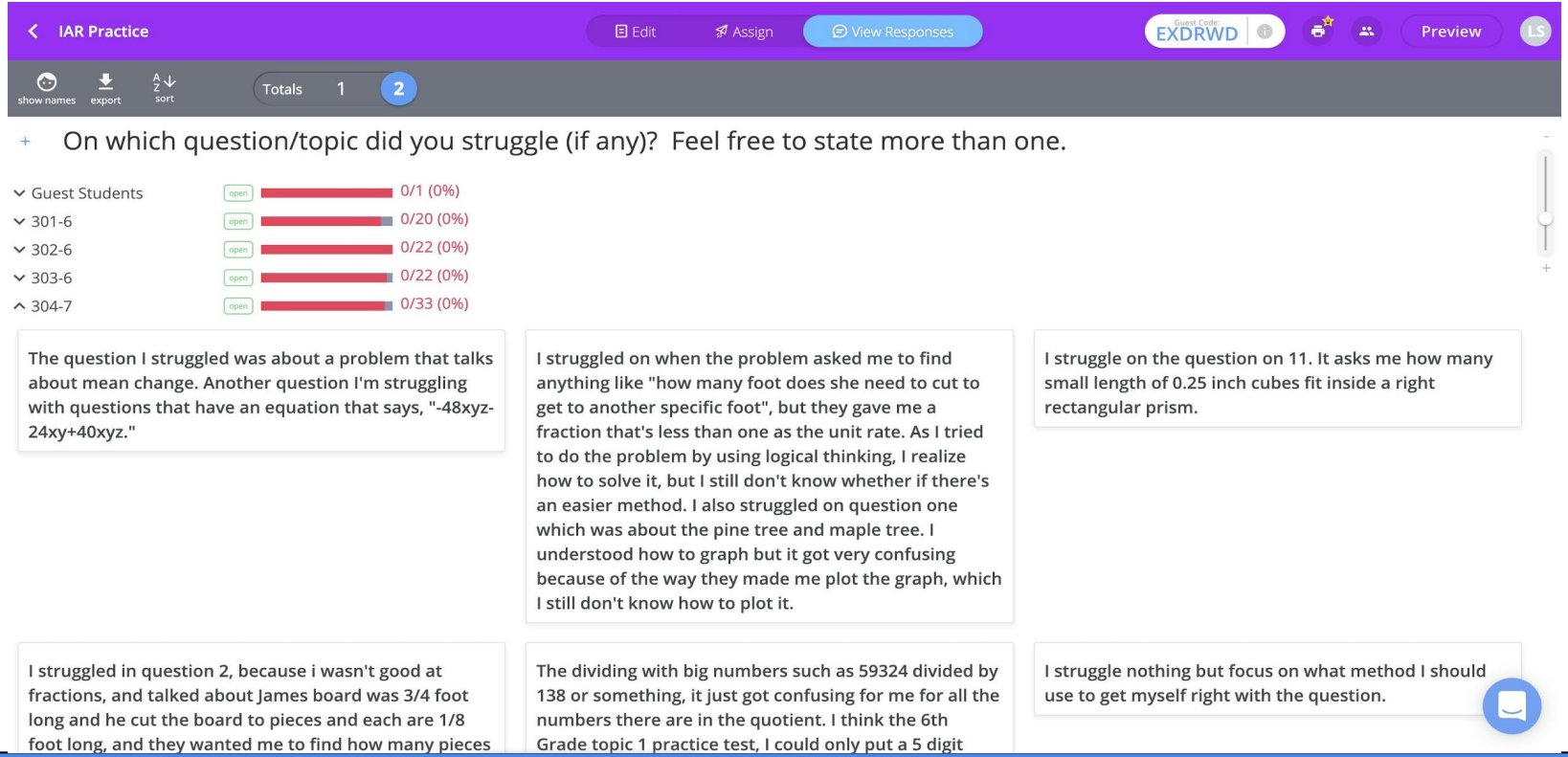
Student Reflection and Metacognition



I think I ~~shouldy~~ should get a score in the range of 64-70 because for my ~~test~~ I forgot some vocabulary in the Problems 4 and 8 which is the ~~color~~ copier size factor and that it is pretty much kind of difficult for me in those problems. I also think I should get that score because I have alot of problems wrong and that I didn't practice/study for the ~~test~~ test at all. I also had the issue on remembering the rule and forgetting ALL about the flag pole problem.

Technology

Formative/Padlet



Formative/Padlet

I struggle on question number three and question number six in 5th-grade Unit 3, because of all the language that they use on the question. All those words make the question hard not the math just I need to understand the questions.

I think is question number 1, and 11, because I don't very understand how to do it, it asks me if it has how many mystery books and how many nonfiction books, also it gave me some number which was 2,3,4,6 and I select 6 on mystery books and 3 on nonfiction books. Question number 11 is the fraction question it confuses me because it is about the area of a cube, I don't very understand how to calculate it so I confuse of it.

Formative/Padlet

nothing it is just that usually people put the formula in lowercase

Big B is area of base in geometry while little b is not the base and is something else like variable?

Desmos--Polygraph

How Polygraph Works:

1. Practice

Each student plays a practice round against the computer to learn how the game works.

2. Play

Next, students are paired with a classmate to play polygraph with mathematical cards. One person chooses a card; their partner asks yes/no questions in order to narrow a field of cards down to one.

3. Reflect

Between rounds, students answer questions that focus their attention on vocabulary and strategy.

Desmos--Polygraph

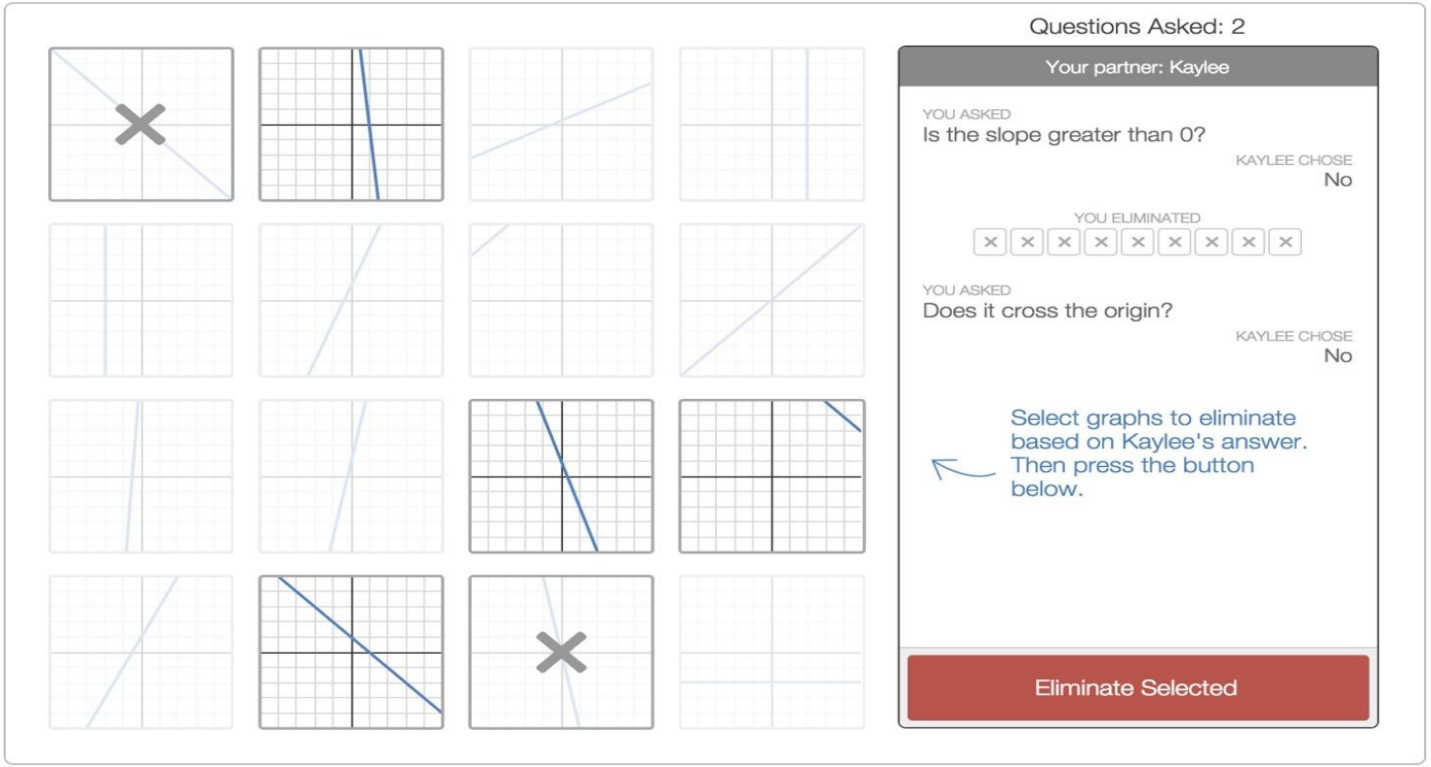
Hey, students!

Go to student.desmos.com

and type in:

D8S9BF

Desmos


Questions Asked: 2
Your partner: Kaylee
YOU ASKED
Is the slope greater than 0?
KAYLEE CHOSE
No
YOU ELIMINATED
YOU ASKED
Does it cross the origin?
KAYLEE CHOSE
No
Select graphs to eliminate based on Kaylee's answer. Then press the button below.
Eliminate Selected

Games

Games

- Promote **Math** Talk.
- Develop Strategic Thinking.
- Provide an Alternative Way to Review.
- Encourage Cooperative Learning.
- Increase Student Engagement and Motivation. ...

General Strategies

Avoid Cold Calls

- Don't call on one student. Instead ask the question of all students allowing a turn and talk. This allows students to rehearse their speak and clarify their understanding before you direct the question to a single student.

- Use technology to allow all students to answer.
  Padlet (written language)
  Flipgrid (oral language)
  GoFormative (written language)

Student Suggestions

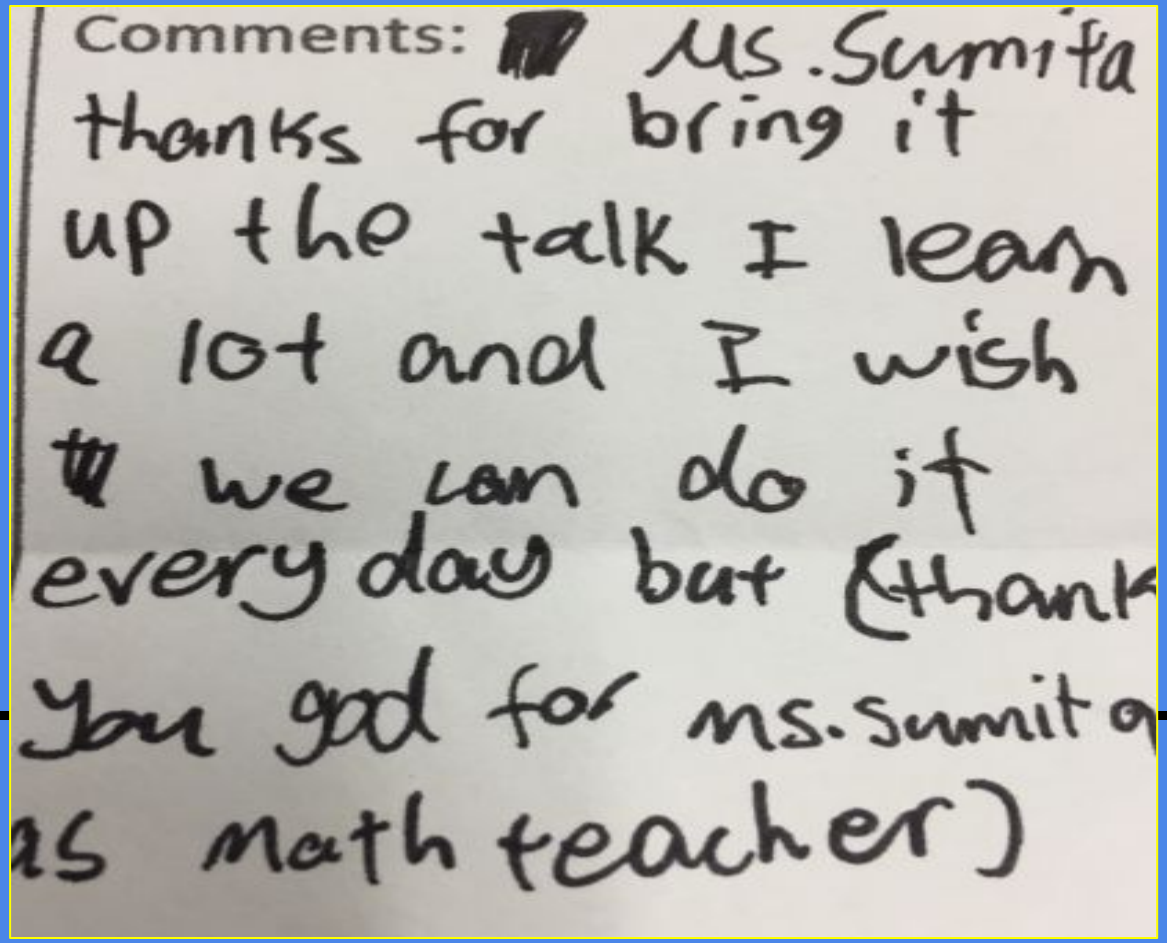
- Support Sense Making
- Optimize Output
- Cultivate Conversation
- Maximize linguistic and meta-awareness

Use Vocabulary Anchor Charts

- Using anchor charts makes the vocabulary readily accessible for the students.

Questions


SAVE A GROWTH MINDSET!
I'm Not Good At This...
I Give Up
I'm On The Right Track!!
This Is Too Hard
It's Good Enough
What Am I Missing?
I'm Awesome At This!!
I'll Use Some of the Strategies I've Learned
This May Take Some Time and Effort
Is This Really My Best Work?
November 28, 2017
Thank You



Get them talking!