Math in the Middle School

April 29, 2019

bit.ly/sas2019math

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Welcome

What do you hope to get out of our time together?

Can you take a few minutes and write down any questions, concerns, or just information you hope to get out of this presentation. We will do our best to address these topics by the end of our time together.



Today's Guiding Questions:

- Why is the SAS math curriculum based on Common Core? What is the Common Core and what is it NOT?
- What does math in the middle school look like? What is Green-Blue-Black?
- What are the math programs at SAS? How are they placed? Can my child switch?
- How can you support your child in middle school math?

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Why is the SAS math curriculum based on Common Core?

- CC Standards build on the best of high-quality math standards from states across the United States.
- CC Standards are internationally benchmarked, drawing on the most important international models for mathematical practice.
- CC Standards maximize consistency in math learning for our transient, multicultural student population.

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What is the Common Core and what is it NOT?

- CC Standards are not curriculum or specific teaching materials. Materials may be written and published based upon the CC Standards.
- CC Standards are not national testing. Although, assessments should assess standards that are taught.
- CC Standards defines a coherent scope and sequence of skills and knowledge. They also provides effective methodology for deepening mathematical learning.

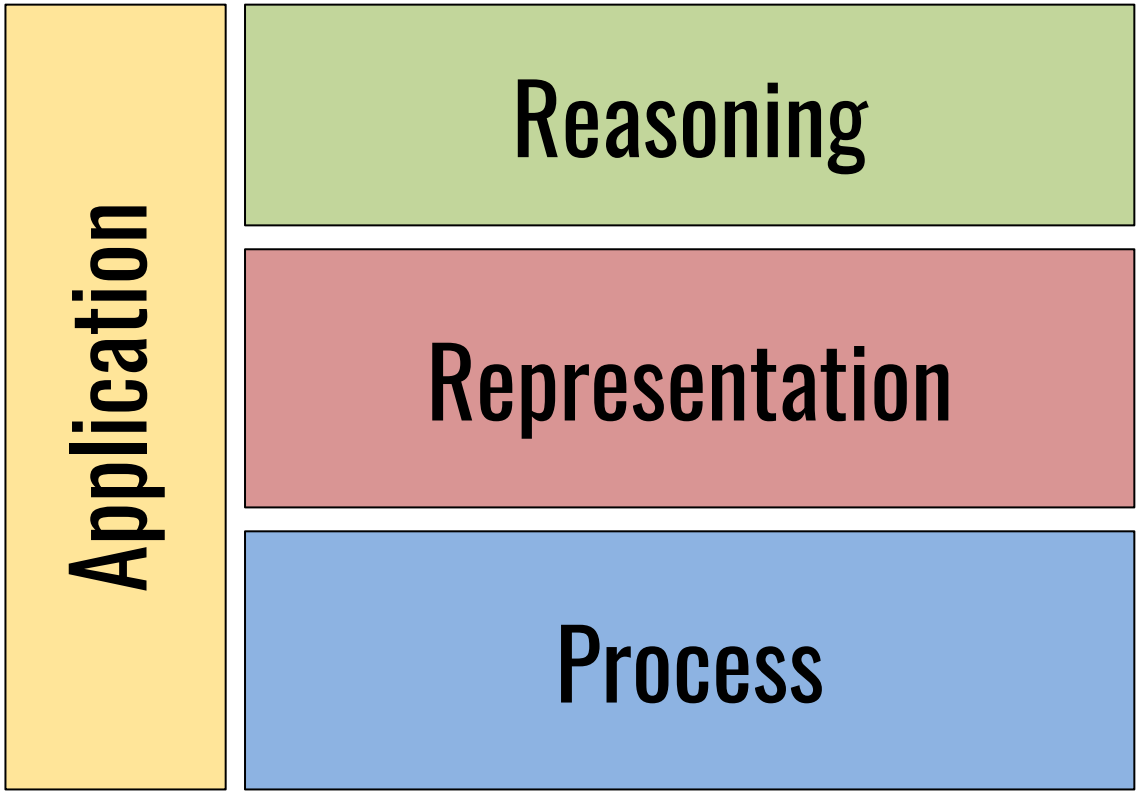
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How are the Math programs aligned at SAS?

Math Practices

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What are the Math Practices?



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Why does the math look differently than it used to?

Traditional Math Focuses On...	Common Core Math Focuses On...
Memorization	Understanding
Answers	Reasons
Compliance	Flexibility
Isolation	Collaboration

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So, what does math look like in the middle school?

Our Ratios and Proportions

NAME _____ DATE _____ PERIOD _____

6-1 Skills Practice

Ratios

Express each ratio as a fraction in simplest form.

1. 8 pencils to 12 pens
2. 42 textbooks to 28 students
3. 27 rooms to 48 windows
4. 15 angel fish to 75 fish
5. 75 cats to 100 dogs
6. 6 aces out of 24 serves
7. 42 flowers to 7 vases
8. 14 boys to 21 girls

Our Kids' Ratios and Proportions



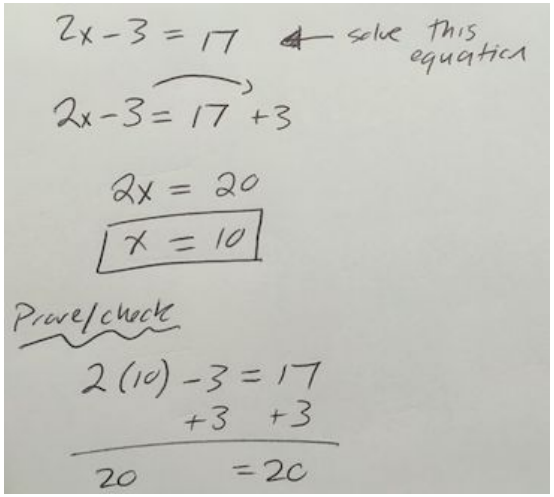
Which drink is the weakest?

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Why do we sometimes insist on doing things "our way"?

Solve the equation $2x - 3 = 17$

How does this work look?



Versus this?

$$2x - 3 = 17$$
$$+3 \quad +3$$
$$\frac{2x}{2} = \frac{20}{2}$$
$$x = 10$$

Prove

$2(10) - 3 = 17$

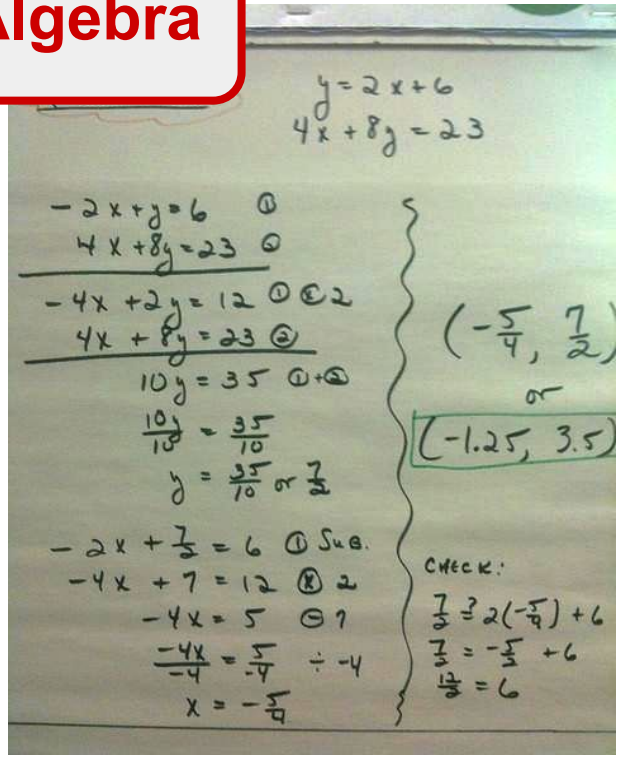
$20 - 3 = 17$

$17 = 17$ ✓

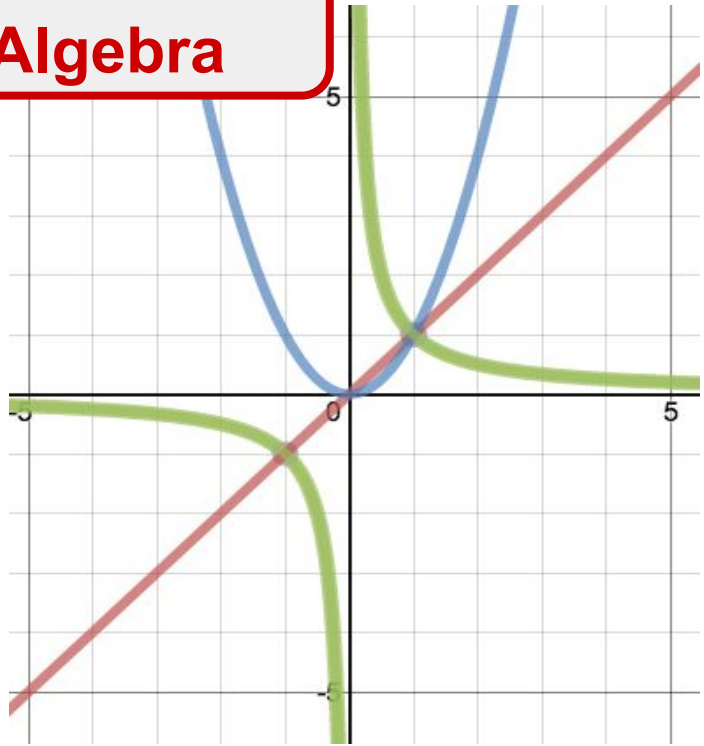
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So, what does math look like in the middle school?

Our Algebra



Our Kids' Algebra



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So, what does math look like in the middle school?
Differentiated Challenge Questions: Green/Blue/Black

Green: Green problem solving tasks are foundational and appropriate for the current grade level. Success depends on understanding and applying required knowledge and skills. Green level problems meet the rigorous course proficiency standards.

Blue: Blue problem solving tasks are advanced and complex. Success depends on extending one's skills in order to recognize and address the added layers of complexity.

Black: Black problem solving tasks are extremely advanced and highly complex. Success depends on creatively applying and extending one's skills, at times in very unfamiliar territory.

Time to try out the green blue black in small groups

At your tables:
See how others are solving the problems

Look for different methods: Ask them to share their way of solving. Push them to explain why that method works, not just the steps

If everyone used the same method, are there alternative methods that you could have used?

Solution Sets

Grade 6

Grade 7

Grade 8

Black

A moving a A bank teller has $10,000 in $20 bills and $50 bills. If the teller has a total of 320 bills, how many of each kind are there? ital was
$70.46. H nearest
integer.

x = \$20 bills
y = \$50 bills

$20x + 50y = 10000$

$x + y = 320 \longrightarrow x = 320 - y$
↙ substitute

$20(320 - y) + 50y = 10000$
$6400 - 20y + 50y = 10000$
$6400 + 30y = 10000$
$-6400 \quad -6400$

$\frac{30y}{30} = \frac{3600}{30}$

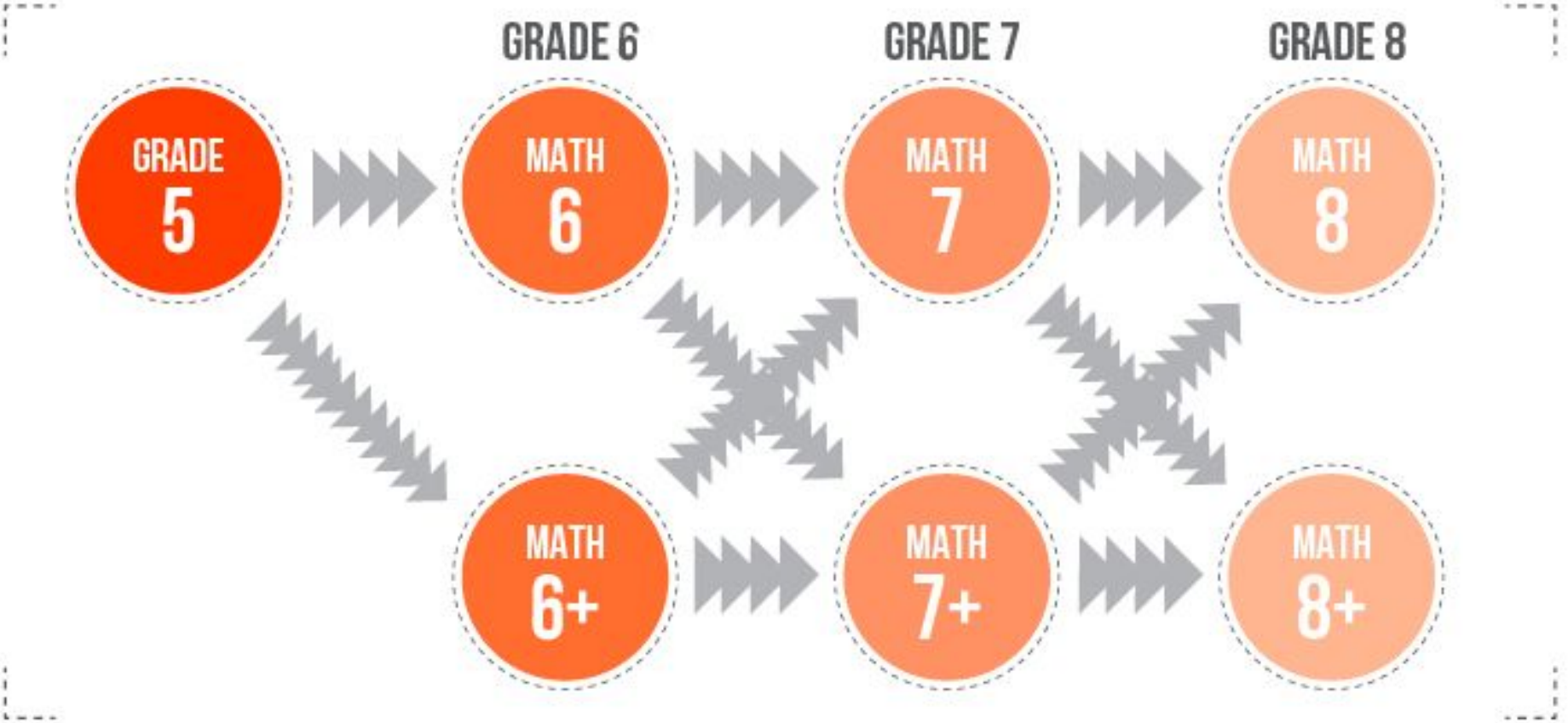
$y = 120$

$x + y = 320$
$x + 120 = 320$
$-120 \quad -120$

$x = 200$

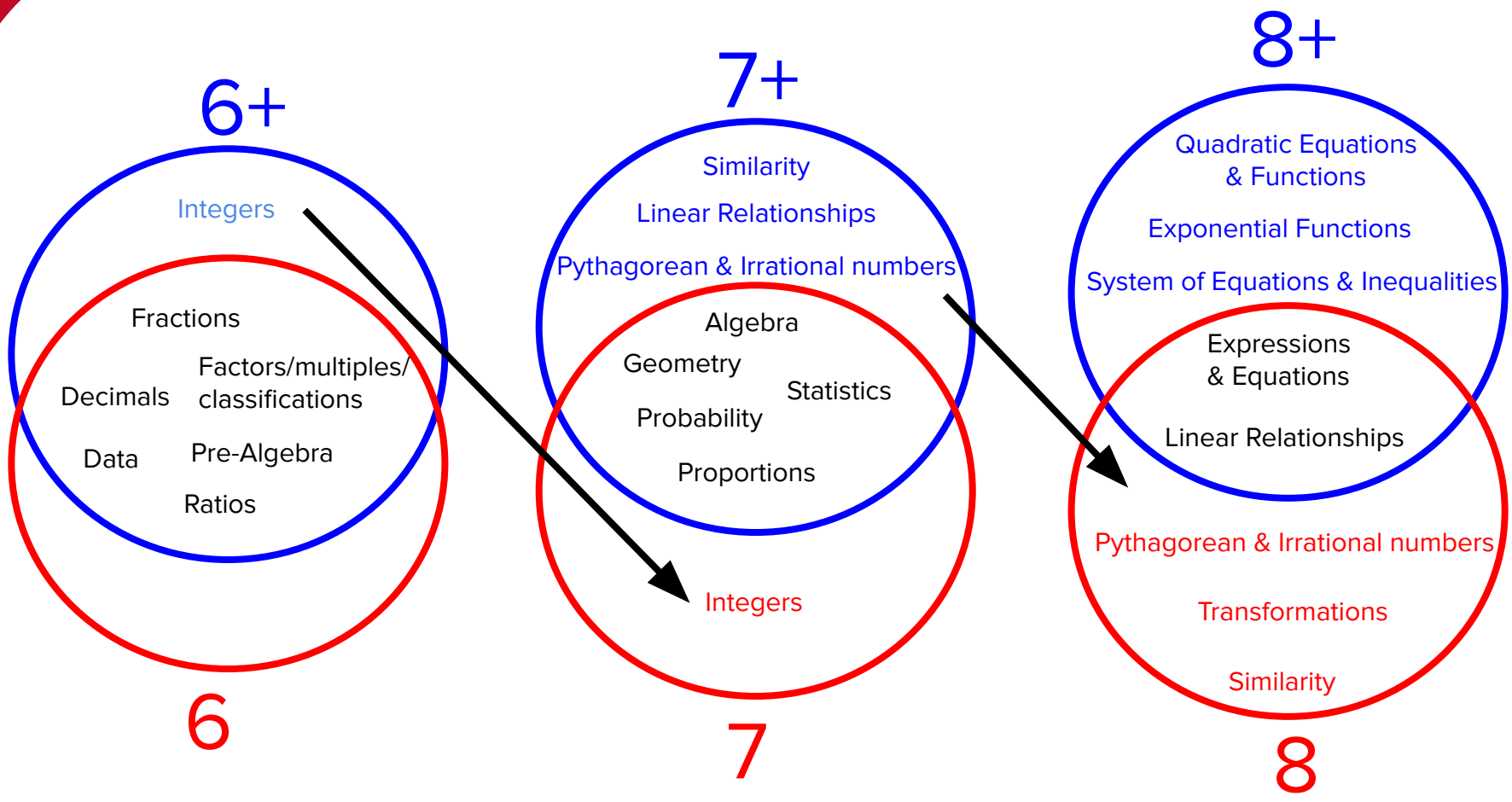
The bank teller has 120 fifty dollar bills and 200 twenty dollar bills

Math Pathways in the MS



Math Pathways: Math 5 to Grade 6

Math 5	**Math 6** **Historically 55%**	Students are placed into Middle School Math based on a number of criteria: • Learning Behaviors: Report Cards and Grade 5 Teacher Feedback • Grade 5 to 6 Diagnostic • Standardized Assessment Data
	Math 6+ **Historically 45%**	Students are placed into Middle School Math based on a number of criteria: • Learning Behaviors: Report Cards and Grade 5 Teacher Feedback • Grade 5 to 6 Diagnostic • Standardized Assessment Data


6+
Integers
Fractions
Factors/multiples/
classifications
Decimals
Data
Pre-Algebra
Ratios
6
7+
Similarity
Linear Relationships
Pythagorean & Irrational numbers
Algebra
Geometry
Statistics
Probability
Proportions
Integers
7
8+
Quadratic Equations
& Functions
Exponential Functions
System of Equations & Inequalities
Expressions
& Equations
Linear Relationships
Pythagorean & Irrational numbers
Transformations
Similarity
8

Math Pathways: Math 6 to Grade 7/7+

Math 6	**Math 7**	Students who have met expectations and have done well but require the pacing of the Math 6 classroom to be most successful. Students who have struggled to meet standards and/or those who require frequent re-testing to meet standards. Students who need additional structure and support in class. Learning behaviors as well as MAP results.
	Math 7+	Students who have met Math 6 standards consistently, and occasionally achieve exemplary on the standards. Students who demonstrate motivation through a pattern of taking on exemplary level challenges in class (attempting ‘blue’ problems) and on assessments. Students who are self-motivated to learn the Grade 7 integers unit independently and/or with support offered from teachers. Learning behaviors as well as MAP results.

Math Pathways: Math 6 to Grade 7/7+

Math 6+	**Math 7**	Students who have struggled to meet standards and/or those who require frequent re-testing to meet standards Students who need additional structure and support in class and would likely be more successful in the pacing of the Math 7 classroom Students who still are still developing fluency in operational and conceptual skills which are essential for success in Math 7+. Learning behaviors as well as MAP results.
	Math 7+	Students who have met Math 6+ standards consistently, and occasionally achieve exemplary on the standards Students who demonstrate motivation through a pattern of taking on exemplary level challenges in class (attempting ‘blue’ problems) and on assessments. Learning behaviors as well as MAP results.

Math Pathways: Math 7 to Grade 8

Math 7	**Math 8**	Students who have struggled to meet standards (typically earning approaching or below on standards) in Math 8 and/or those who have only managed to meet standards through frequent re-testing. Students who need additional structure and support in class or who need a reduced pace of coverage.
	Math 8+	Students who have met Math 8 expectations consistently (earning 4 and 3 grades on standards), without frequent re-tests.

Math Pathways: Math 7+ to Grade 8

Math 7+	**Math 8**	Students who have struggled to meet standards (typically earning approaching or below on standards) in Math 8 and/or those who have only managed to meet standards through frequent re-testing. Students who need additional structure and support in class or who need a reduced pace of coverage.
	Math 8+	Students who have met Math 8 expectations consistently (earning 4 and 3 grades on standards), without frequent re-tests.

Math Pathways: Math 8 to Grade 9

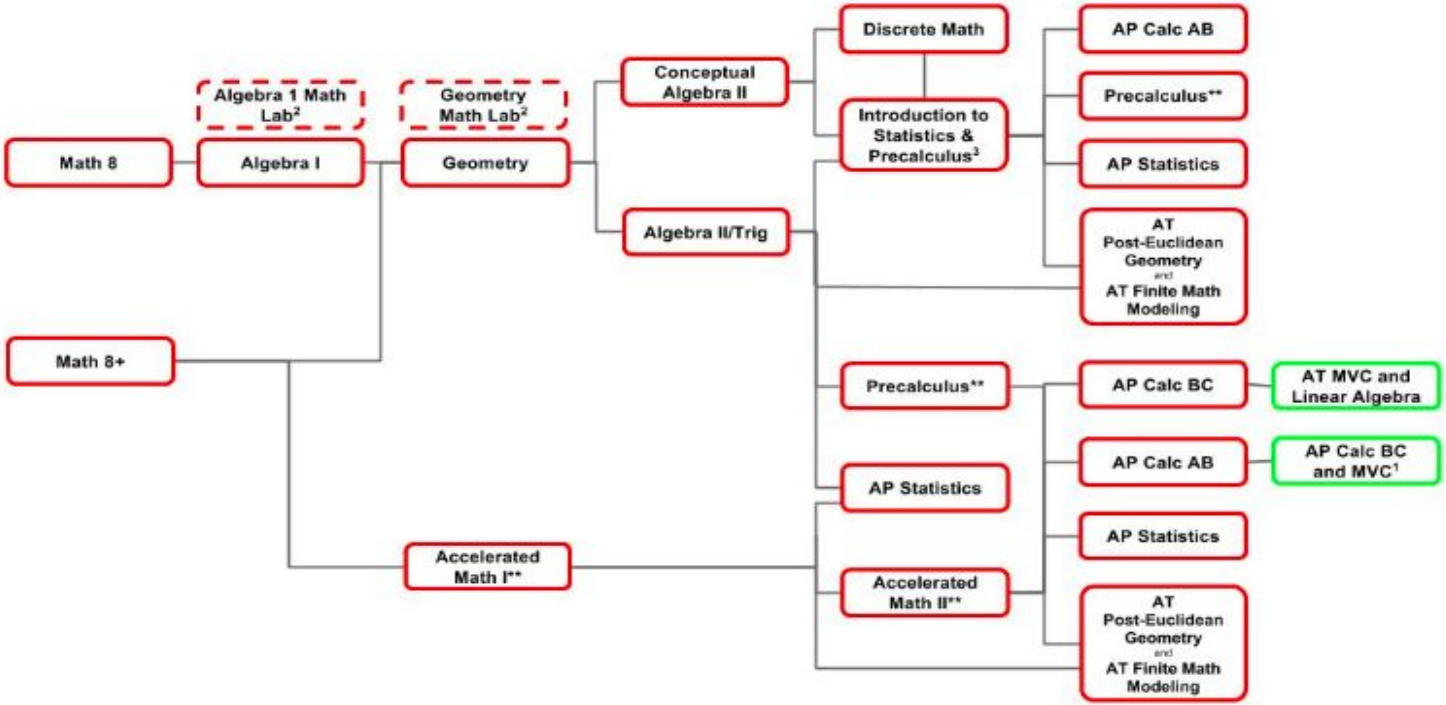
Math 8	**Algebra 1 with Math Lab**	Students who have struggled to meet standards (typically earning approaching or below on standards) in Math 8 and/or those who have only managed to meet standards through frequent re-testing. Students who need additional structure and support in class or who need a reduced pace of coverage.
	Algebra 1	Students who have met Math 8 expectations consistently (earning 4 and 3 grades on standards), without frequent re-tests.

Math Pathways: Math 8+ to Grade 9

Math 8+	**Algebra 1**	Students who have struggled to meet expectations (typically earning approaching grades or below on standards) in Math 8+ and/or those who have only managed to meet expectations through frequent re-testing.
	Geometry (This is the appropriate placement for the large majority of students)	Students who have met Math 8+ expectations consistently (typically earning "Exemplary" and "Meeting" grades on standards), without frequent re-tests. Students who have excelled in Math 8+, consistently producing exemplary work, but have re-tested frequently.
	Accelerated Math 1	Students who have excelled in Math 8+, consistently producing exemplary work (earning "Exemplary" grades on ALL standards), without re-tests, and who have shown a depth of interest and understanding in class discussions. Standardized test scores are also considered.

*** Students aiming for Accelerated Math 1 must attempt Blue and Black Level Questions (Challenge Problems) in a separate spiral notebook.**

Math Pathways: MS to HS



NOTES:

1. AP Calc BC and MVC will be offered for the last time **in its current year long form** in 2018/9
2. Both Algebra 1 and Geometry Math Labs require administrative approval for enrollment
3. FST has been renamed **Introduction to Statistics & Precalculus**

How can you support your child?

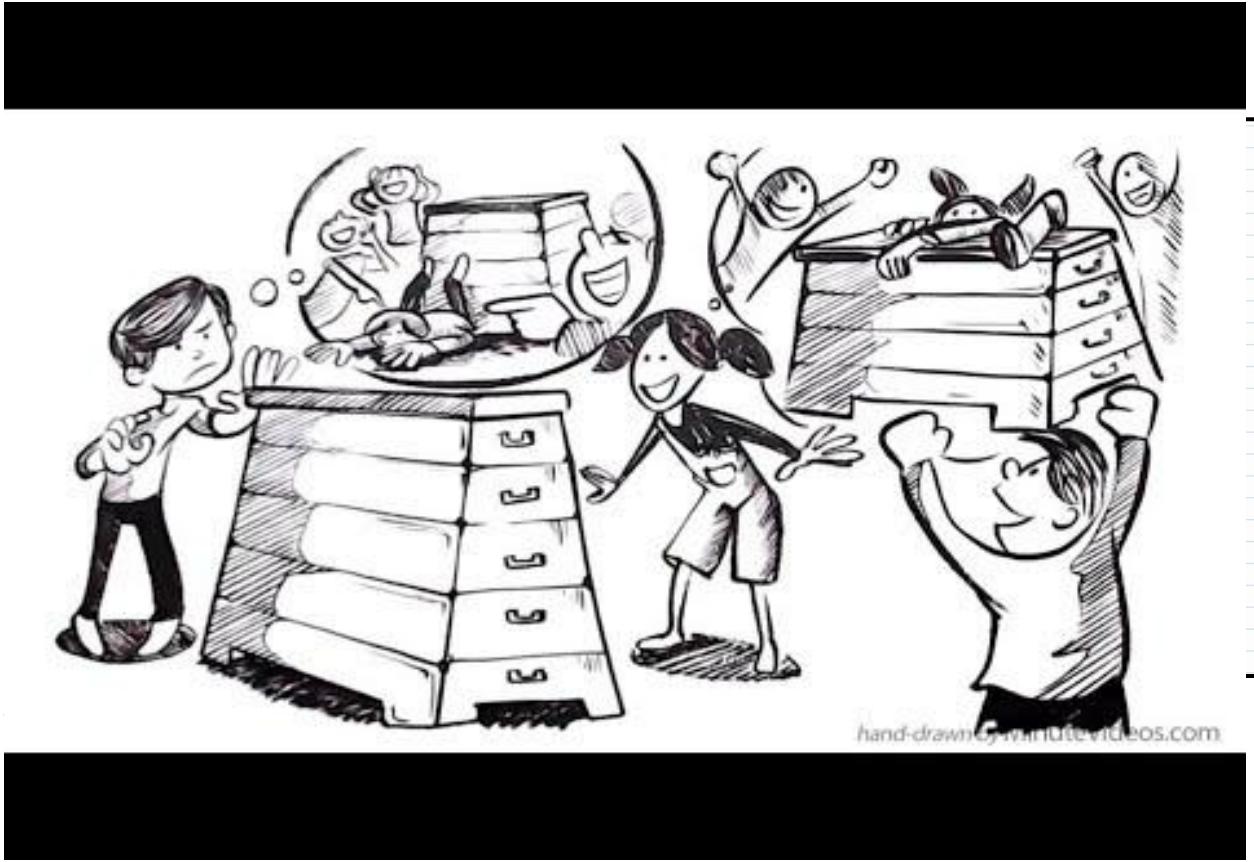


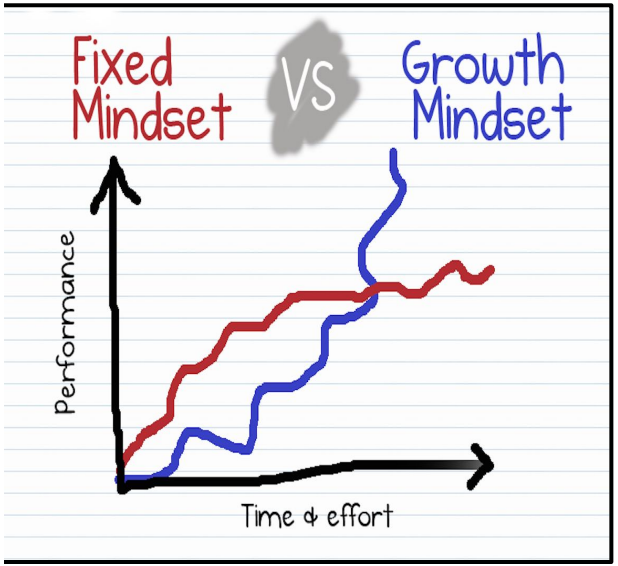
Primary Source: The daily class slide sets for each lesson



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How can you support your child?






FIXED MINDSET
GROWTH MINDSET
• SOMETHING YOU'RE BORN WITH
• FIXED
SKILLS
• COME FROM HARD WORK.
• CAN ALWAYS IMPROVE
• SOMETHING TO AVOID
• COULD REVEAL LACK OF SKILL
• TEND TO GIVE UP EASILY
CHALLENGES
• SHOULD BE EMBRACED
• AN OPPORTUNITY TO GROW.
• MORE PERSISTANT
• UNNECESSARY
• SOMETHING YOU DO WHEN YOU ARE NOT GOOD ENOUGH
EFFORT
• ESSENTIAL
• A PATH TO MASTERY
• GET DEFENSIVE
• TAKE IT PERSONAL
FEEDBACK
• USEFUL
• SOMETHING TO LEARN FROM
• IDENTIFY AREAS TO IMPROVE
• BLAME OTHERS
• GET DISCOURAGED
SETBACKS
• USE AS A WAKE-UP CALL TO WORK HARDER NEXT TIME.

What does a fixed mindset sound like?

- I am no good at math
- I'll never be as good as her
- I am awesome at math

What does a growth mindset sound like?

- ~~I am no good at math~~
  - You need to keep working at it
- ~~I'll never be as good as her~~
  - Ask her how she does it
- ~~I am awesome at math~~
  - You seem to be on the right track

What does a fixed mindset sound like?

- It was a careless error
- It was a trick question
- My teacher doesn’t like me

What does a growth mindset sound like?

- ~~It was a careless error~~
- ~~It was a trick question~~
- ~~My teacher doesn't like me~~

"It's okay to make mistakes, let's see if we can work it out together."

What does a fixed mindset sound like?

- Great job! You are so smart.

- It’s okay, I was never good at math.

What does a growth mindset sound like?

- ~~Great job! You are so smart.~~
  - Great job! You must have worked hard at this.

- ~~It's okay, I was never good at math.~~
  - I had to work hard at math, too.

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