

HCSD Proposed Math Pathways 2021-2022

Board of Trustees Meeting
May 12, 2021

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Introductions

Department Teachers

Megan Blake (6)

Melissa Li (6)

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Perry Kittredge (8)

Johnny Lau (8)

Administration

Maria Brady

Dave Miller

Matthew Lindner

Louann Carlomagno

Math Mission/Vision Statement

Utilizing all aspects of the HCSD Essential Outcomes, the Crocker Math Department is committed to supporting the development of strong mathematical foundations, complex problem solving skills, and a lifelong love of mathematics for all students.

To do this, the department engages students in learning that is rooted in essential skills, lessons that are connected to the world and allow students to go deep in their mathematical understanding, and learning that builds on concepts from unit to unit and from year to year.

The mathematics classroom focuses on collaboration, diverse thought and problem solving techniques, and ensuring that students see mathematics as an essential part of their everyday lives and the world around them.

Objectives We Would Like to Achieve

More enriched curriculum by offering heterogeneous math course in Sixth Grade

Allows for subsequent course-appropriate placement by Crocker math teachers that understand the math curriculum and know students' academic abilities

Prioritizes students to acclimate to Crocker and the middle school environment

Objectives We Would Like to Achieve (cont'd)

All students to build a strong foundation as Sixth Graders as a whole child

All students develop a growth mindset and see themselves as mathematicians capable of succeeding in advanced mathematics

Time to explore topics/standards deeply to promote **mathematical mindset** and **conceptual thinking**

Terminology

Accelerated

moving at an accelerated pace through curriculum

studying more than one year of curriculum in one school year

Advanced

studying curriculum that is advanced of the grade level standards

Compressed

differentiating curriculum to omit previously studied topics, reduce redundancy, and merge related topics into existing units of study

in a compressed structure, no topics are eliminated from the curriculum

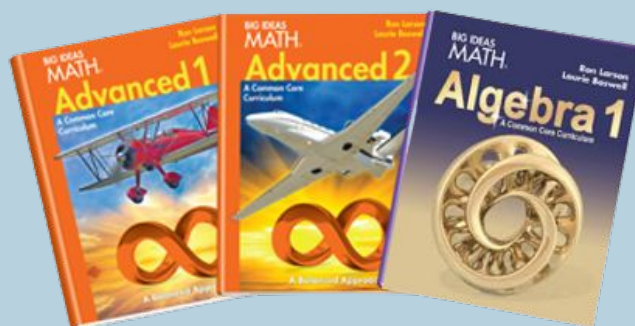
Structure, Pathways, and Endpoints

Where we are...

Grade Level Pathway



Accelerated Pathway



	6th Grade	7th Grade	8th Grade
Grade-Level Path	Common Core 6	Common Core 7	Common Core 8
Accelerated Path	Accelerated Common Core 6 (Advanced 1)	Accelerated Common Core 7 (Advanced 2)	HS Algebra 1

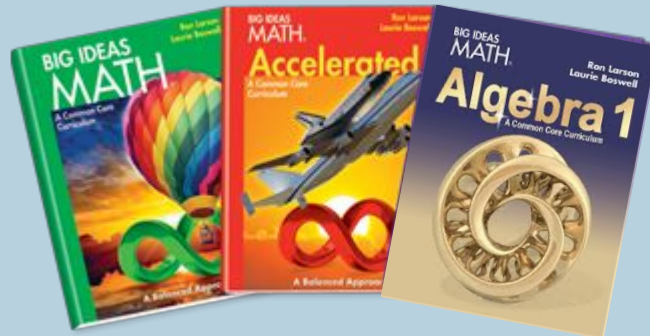
Structure, Pathways, and Endpoints (cont'd)

Where we want to be...

Grade Level Pathway



Compressed Pathway



	6th Grade	7th Grade	8th Grade
Grade-Level Path	Common Core 6	Common Core 7	Common Core 8
Compressed Path	Common Core 6	Compressed Common Core 7/8	HS Algebra 1

Structure, Pathways, and Endpoints (cont'd)

Summary of both pathways

Current:

	6th Grade	7th Grade	8th Grade
Grade-Level Path	Common Core 6	Common Core 7	Common Core 8
Accelerated Path	Accelerated Common Core 6 (Advanced 1)	Accelerated Common Core 7 (Advanced 2)	HS Algebra 1

Proposed:

	6th Grade	7th Grade	8th Grade
Grade-Level Path	Common Core 6	Common Core 7	Common Core 8
Compressed Path	Common Core 6	Compressed Common Core 7/8	HS Algebra 1

Math 7 Accelerated (Current) and Math 7 Compressed (Proposed)

Content That Would Remain Unchanged

7th Grade Standards

Equations

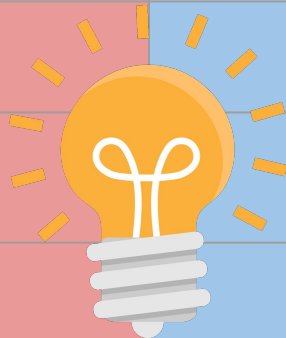
Inequalities

Surface Area & Volume

Circles & Area

Constructions & Scale Drawings

Probability & Statistics



8th Grade Standards

Exponents & Scientific Notation

Volume & Similar Solids

Angles & Triangles

Transformations

**Real Numbers and
the Pythagorean Theorem**

Content Changes in the Math 7 Accelerated to Math 7 Compressed Tracks

7th Grade Standards

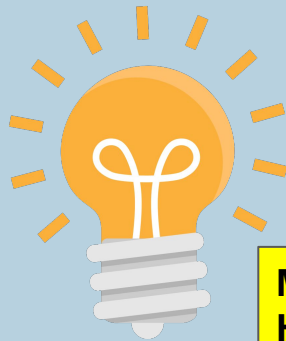
Integers

Rational Numbers

Ratios and Proportions

Percents

**Added from
ACC 6**



**Moved to
HS
Algebra 1**

8th Grade Standards

**Systems of Linear
Equations**

Functions

**Data Analysis and
Displays**

Content Adjustments

	Grade-Level Path			(Current) Accelerated Path			(Proposed) Compressed Path		
	CC6	CC7	CC8	6-Accel	7-Accel	8-HSAIgebra1	CC6	7-Compressed	8-HSAIgebra1
Ch 01-05	X			X			X		
Ch 06-10	X			X			X		
Ch 01-05		X		X				3/5	2/5 (embedded)
Ch 06-10		X			X			3/5	2/5 (embedded)
Ch 01-05			X		X			X	
Ch 06-10			X		X			X	
Ch 01-05						X			X
Ch 06-11						X			X
Total Chapters	10	10	10	15	15	11	10	16	11

Legend:

Big Ideas Math Course 1

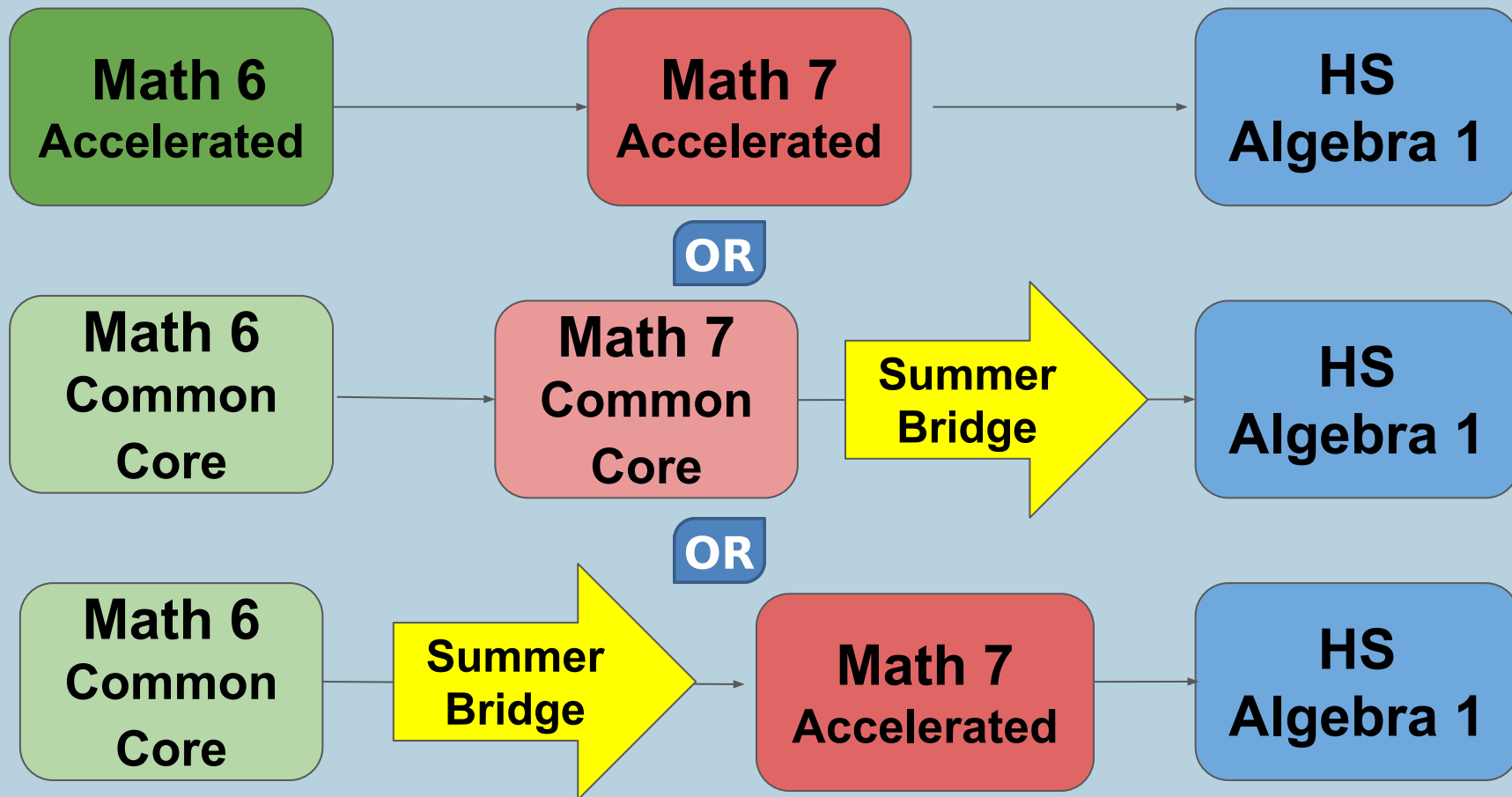
Big Ideas Math Course 2

Big Ideas Math Course 3

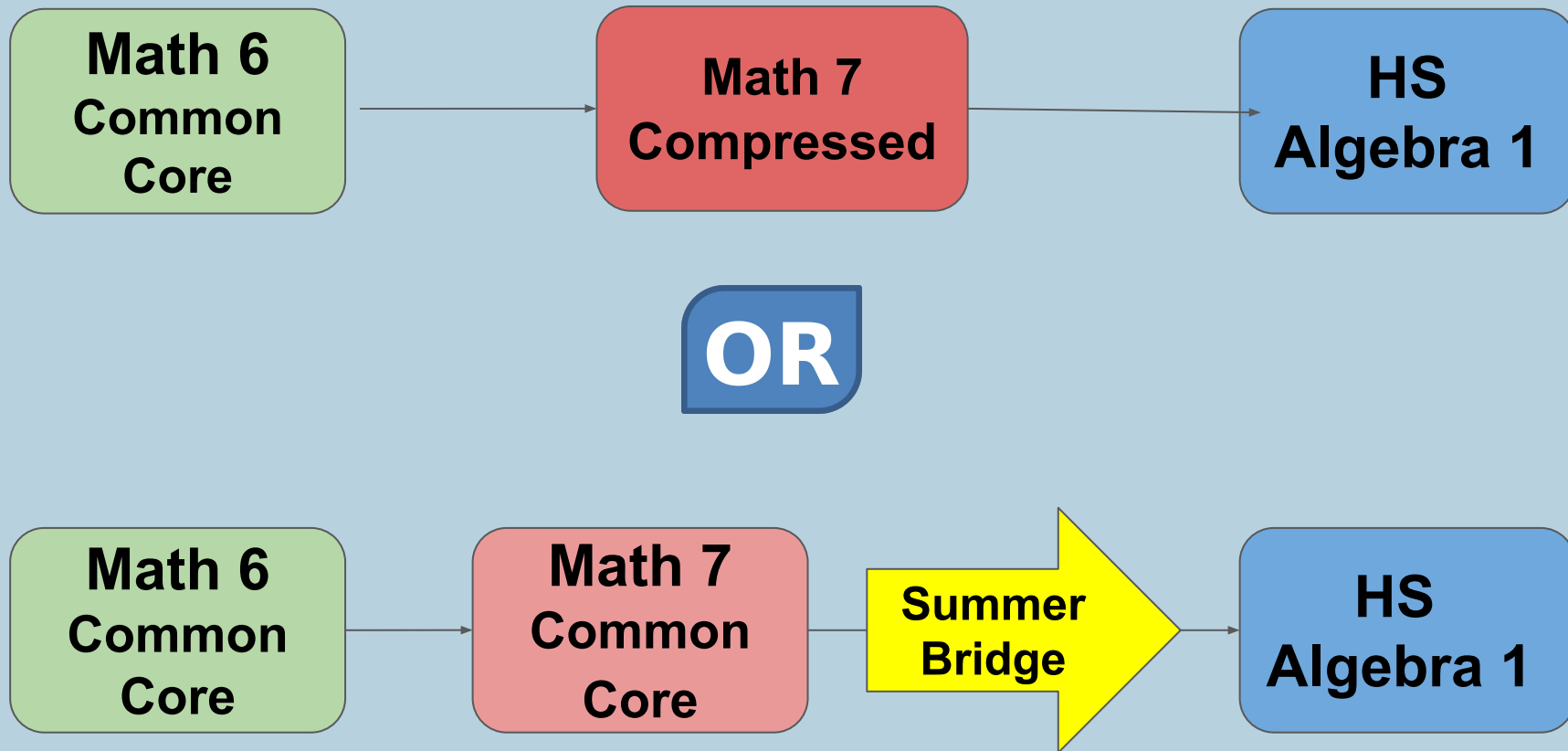
Big Ideas Math HS Algebra 1

Compressed Pathway: differentiating curriculum to omit previously studied topics, reduce redundancy, and merge related topics into existing units of study. In a compressed structure, no topics are eliminated from the curriculum.

Current Pathways to HS Algebra 1 in Grade 8



Proposed Pathways to HS Algebra 1 in Grade 8 (cont'd)



Proposed Pathways to HS Algebra 1 in Grade 8 (cont'd)

How will this proposed new pathway impact Crocker's current Sixth and Seventh Graders?

It will not.

Current Sixth and Seventh Graders will remain in their current pathways as outlined below:

	6th Grade	7th Grade	8th Grade
Grade-Level Path	Common Core 6	Common Core 7	Common Core 8
Accelerated Path	Accelerated Common Core 6 (Advanced 1)	Accelerated Common Core 7 (Advanced 2)	HS Algebra 1

Instructional and Assessment Supports

- Columbia University Study - high-level heterogeneous grouping increased achievement for all students
- Jo Boaler's research
 - Mathematical Mindsets
 - Classroom Instruction and Professional Development
 - Mathematics Tasks and Complex Instruction
- Silicon Valley Math Initiative
- Brain Plasticity - depth of understanding and building connections
- 2021 DRAFT Mathematics Framework - [Introduction](#)
- Multiple Assessment Measures

Class: CC6

Unit: Fractions and Decimals

Number of Days: 18

Sample Unit

7	8	9	10	11
No School	*Folder Check	*Tangram Writing Assignment	*Notes 2.1	Fractions Fly Swatter Game
	*Notes 1.6 Extension	HW: Math Cookies Worksheet	HW: 2.1 worksheet	
	2 more			
14	15	16	17	18
*Notes 2.2	*Notes 2.3	Fractions Review	Chapter 2 Quiz	Fractions Stations
HW: 2.2 Worksheet	HW: 2.3 Worksheet	HW: Text pg. 77	HW: Text pg. 75 #27-37 (odd)	
21	22	23	24	25
*Notes 2.4	*Notes 2.5	*Review 2.4 and 2.5	*Notes 2.6	Review 2.6
HW: 2.4 Worksheet	HW: 2.5 Worksheet	HW: Text pg. 90 #52-60 (even)	HW: 2.6 Worksheet	
28	29	30	31	Nov 1
Chapter 2 Stations	Chapter 2 Test Review	Chapter 2 Test	Chapter 2 Performance Task	No Class
HW: Text pg. 104 (all) & pg. 43 #10-16(e)	HW: Text pg. 96 #28 - 32 (even) AND Tex			

Sample Unit (cont'd)

Class: ACC6

Unit: Fractions and Decimals

Number of Days: 11

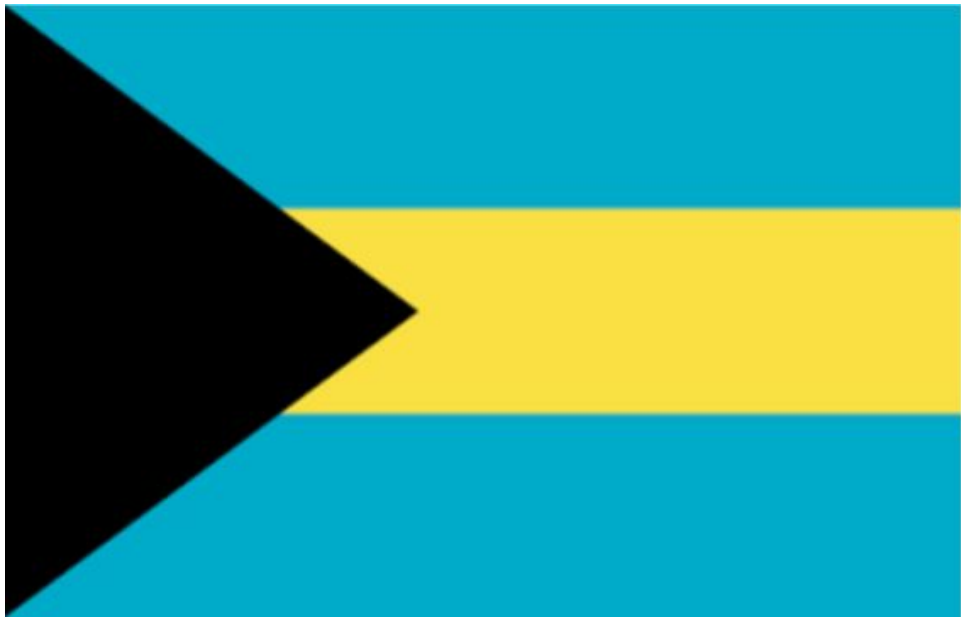
MON 30	TUE Oct 1	WED 2	THU 3	FRI 4
*Notes 1.6 Extension	*Notes 2.1	*Notes 2.2	*Notes 2.3	Quiz 1.6E - 2.3
HW: 1.6 E Worksheet	HW: 2.1 Worksheet	HW: 2.2 Worksheet	HW: 2.3 Worksheet	
7	8	9	10	11
No School	*Notes 2.4	*Notes 2.6	*Review Game	Chapter 2 Review
	*Notes 2.5	HW: 2.5 Worksheet	HW: 2.6 Worksheet	
	HW: 2.4 Worksheet			
14	15	16	17	18
Chapter 2 Performance Task	Chapter 2 Test	*Notes 11.2	*Notes 11.3	Integer Review
HW: Text pg. 104 #1-12 and #17-19 Boni	HW: Finish Fraction Recipe Problem - du	HW: 11.2 Worksheet	HW: 11.3 Worksheet	

A heterogeneous class would allow for an additional 7 days of learning in this unit.

How would you making use of the extra days in a heterogenous class?

- **Low Floor/High Ceiling Activities** - math problems have multiple entry points so they are accessible to all students, but they can also be solved at higher levels.
- **Introduce “How to Write in Mathematics”** - Most students have not written a paragraph relating to math before.
- **Teacher SWAP** - Novice Student Practice and Reinforce with one teacher while Proficient Students Use Application or Go Deeper with the other teacher.
- **Rotating Stations** - Including Games, Error Analysis , Practice, and Differentiation.
- **Real Life Applications** - Apply learned material to problems and projects.

What fraction of the flag is each color? Be as precise as possible.
Annotate the flag to show your thinking.



Justify your reasoning:

Blue:

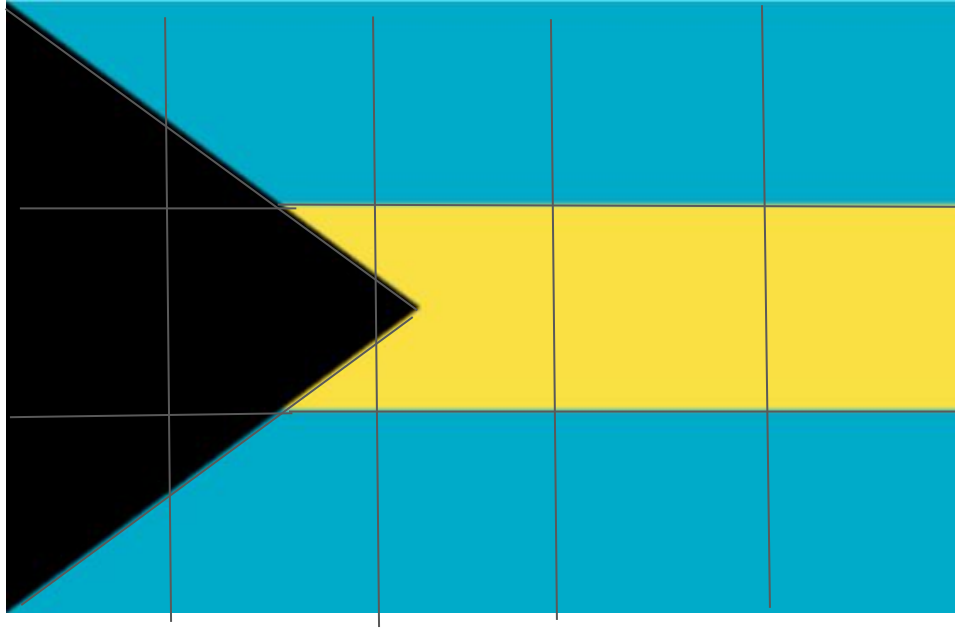
Yellow:

Black:

Name(s):

Flag Fraction Talk

Annotate the flag to show your thinking.



Justify your reasoning:

Blue: 50% Blue

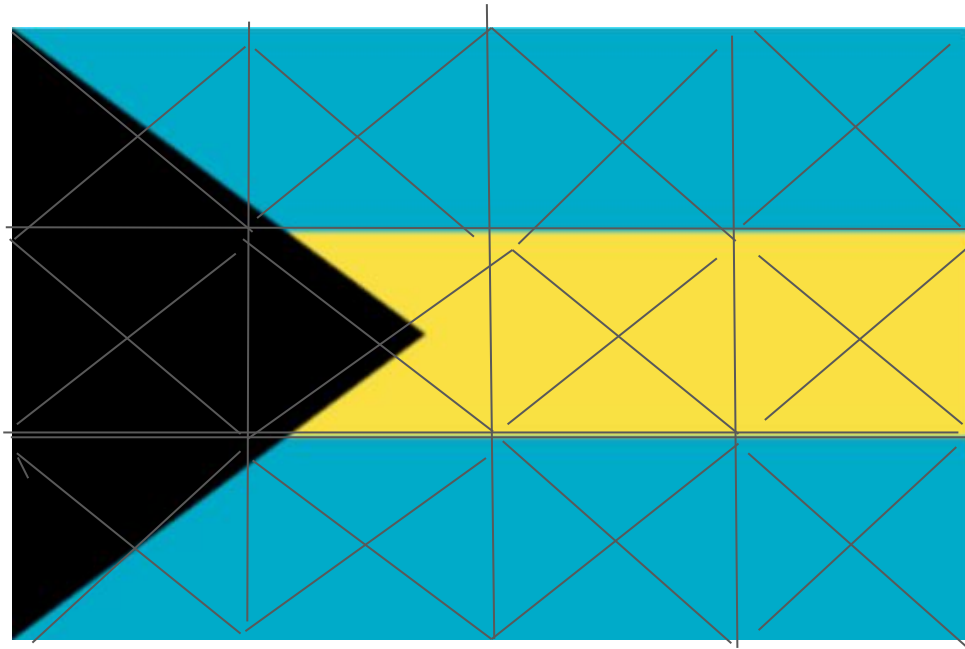
Yellow: 15% Yellow

Black: 35% Black

Name(s): Student A, B, C, D

Flag Fraction Talk

Annotate the flag to show your thinking.



Justify your reasoning:

Blue: $28/48$

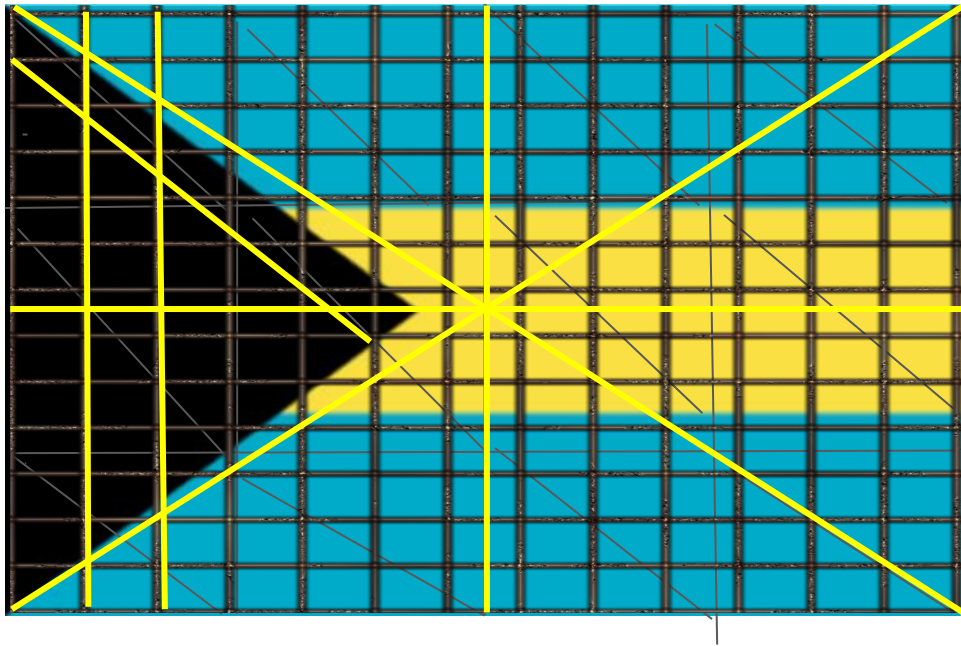
Yellow: $11/48$

Black: $9/48$

Names: Student E, F, G

Flag Fraction Talk

Annotate the flag to show your thinking.



Justify your reasoning:

Blue: $92/169$ blue

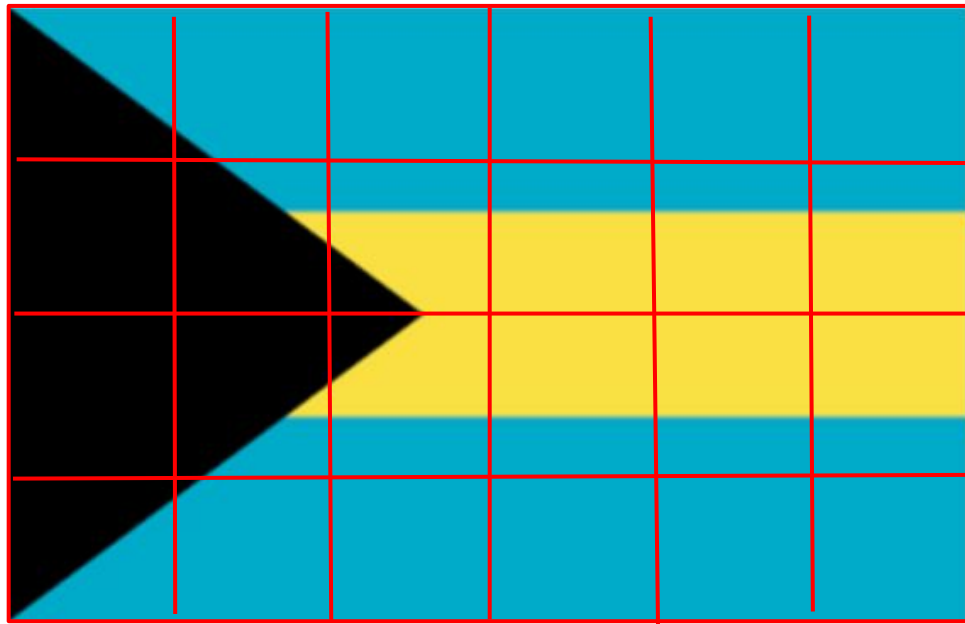
Yellow: $41/169$ yellow

Black: 36 black

Name(s): Student H, I, J, K

Flag Fraction Talk

Annotate the flag to show your thinking.



Justify your reasoning:

I know blue is $15\frac{2}{3}$ out of 24 because we

Blue: $15\frac{2}{3}$ out of 24 because we made a graph, counted approximately how many blue squares are on one side and multiplied that by 2 since there a 2 sides.

Yellow: 5

Black: 5

Name(s): Student L, M, N

PART ONE - CREATE A PICTURE:

Visit: <https://toytheater.com/pattern-blocks/>

Create a picture on your using the yellow, red, blue, and green pattern blocks. You must use at least one of each color.

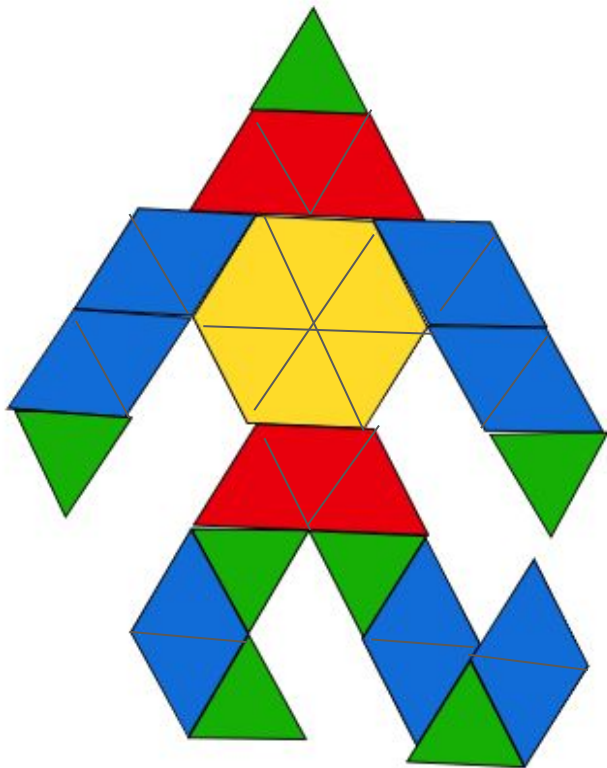
DO NOT USE THE ORANGE OR TAN COLORED BLOCKS.

Take a screenshot of your pattern block creation and copy and paste it onto the next slide. Crop out the extra and enlarge the picture to fit the slide. Then annotate the creation using the line tool. You should end up taking each of the shapes and cutting them into equivalent triangles.

PART TWO: WRITE A PARAGRAPH

Answer the question, “What fraction of the pattern is red? Explain how you found your answer.” Write your paragraph on the following slide, below are the directions for easy editing. Use the following criteria to help you:

1. Compose a paragraph with a minimum of 4 sentences.
2. Use academic vocabulary, including: **numerator**, **denominator**, **fraction**, **reduce/simplify**, **triangles**, **divisible**, **part**, and **whole/total**. Highlight each word as you use it. You need to have every color in your paragraph for full credit.
3. Use the grammar rules as you would in English class including proper punctuation and capitalization.



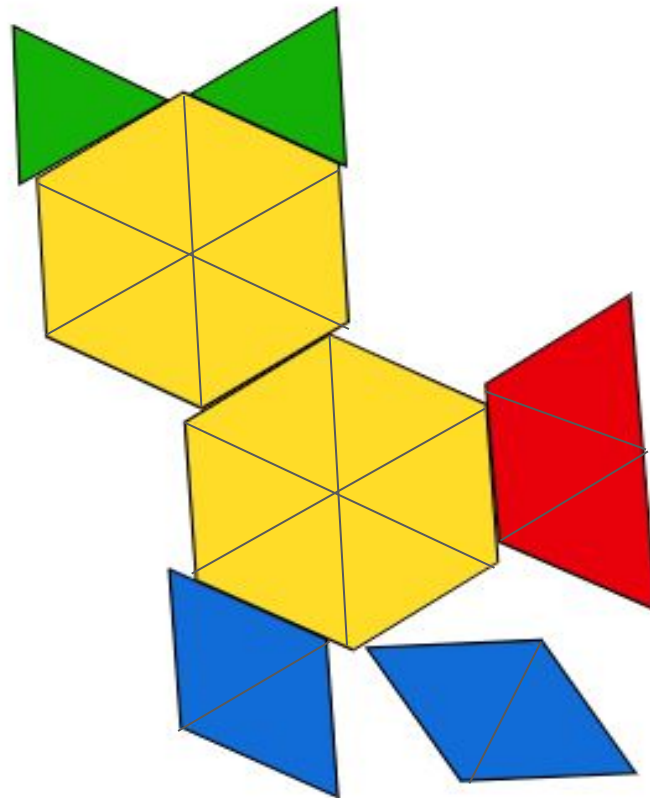
33 triangles

Title: the man

WHAT FRACTION OF THE PATTERN IS RED? EXPLAIN HOW YOU FOUND YOUR ANSWER.

The first thing i did to find what **fraction** is red is first seeing how many **triangles** i would have. My drawing had 33 triangles, since there are 31 triangles i know to put 33 as my **denominator**. The next thing i must do is find the **numerator**, in order to find the numerator i counted how many triangles are red. I counted 6 which means the Fraction is $\frac{6}{33}$. Another step that i should do is see if my fraction is in its simplest form, I can see if it is **Simplified** all the way by seeing if 6 and 33 can both be divided by a certain number [they both have to be **divisible** by the same number]. 6 and 33 can both be divided by 3, so i divide both of them and get $\frac{2}{11}$. Since the picture is 1 **whole**, and the red takes up to **parts**. It means that $\frac{2}{11}$ of the picture is every other color besides red [and tan]

21 total triangles



WHAT FRACTION OF THE PATTERN IS RED? EXPLAIN HOW YOU FOUND YOUR ANSWER.

When I cut my shape I came up with a total of 21 equilateral triangles. I noticed that 3 triangles go into one trapezoid. If there are 21 triangles in my shape then the red part of my shape is $\frac{3}{21}$. This fraction can be reduced to $\frac{1}{7}$ because both the numerator and the denominator are divisible by 3.

The Trail Mix Project

Step One: Make a Trail Mix Recipe that would be your ideal combination ingredients.

Step Two: Find the ingredients at Costco or Amazon. The key is to buy in bulk because you want to make as many servings as possible.. Take a screenshot of each ingredient and paste it here.

Step Three: Use math to find the total number of cups each package contains. Take a photo of your math and paste it here.

Step Four: Find out how many full batches of your trail mix you can make. Explain how you know.

Step Five: Calculate the cost of one batch of your trail mix. Take a photo of your math and paste it here.

In Summary

- Currently, advanced students are in the Accelerated Pathway, which starts in 6th grade -- students learn all of the sixth grade content and half of the seventh grade content in Grade 6. Students learn the rest of the seventh grade content and all of the eighth grade content in Grade 7.
- In the proposed Compressed Pathway, advanced students start acceleration in the 7th grade -- all students learn the 6th grade content heterogeneously. Then in 7th grade, they learn all of the seventh grade content and the eighth grade content necessary for and not subsumed by H.S. Algebra 1 in the eighth grade.
 - This will allow **all** 6th graders to access a deeper, more engaged understanding of mathematics in general (same breadth, more depth).

In Summary (cont'd)

- The proposed Compressed Pathway will also allow Crocker teachers to better and formally assess students' ability for the HS Algebra pathway in seventh and eighth grade.
- The proposed Compressed Pathway will also provide an equitable opportunity for students to demonstrate their readiness for advancement via multiple measures during their sixth grade year, rather than fifth grade, therefore potentially capturing more students for advancement than before.
- Although redundancy will be reduced, no topics will be omitted or compromised from the curriculum from the current Accelerated Pathway to the proposed Compressed Pathway.
- All students in the Compressed Pathway will take HS Algebra 1 in eighth grade as they do currently. This remains unchanged.

Questions?