HS Algebra Tiles Virtual Event: Area Model

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Welcome

Algebra Tile Virtual Session

As you join:

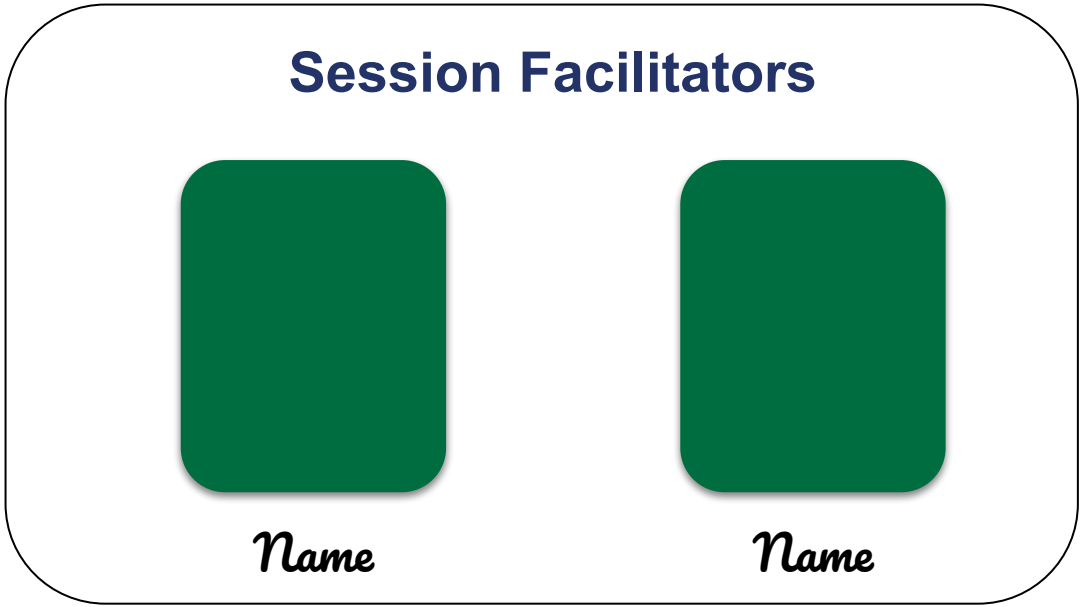
- Feel free to test your microphone, then please mute yourself.
- In the Public Chat, share your location, school, and which course you teach in the public chat.

CPM

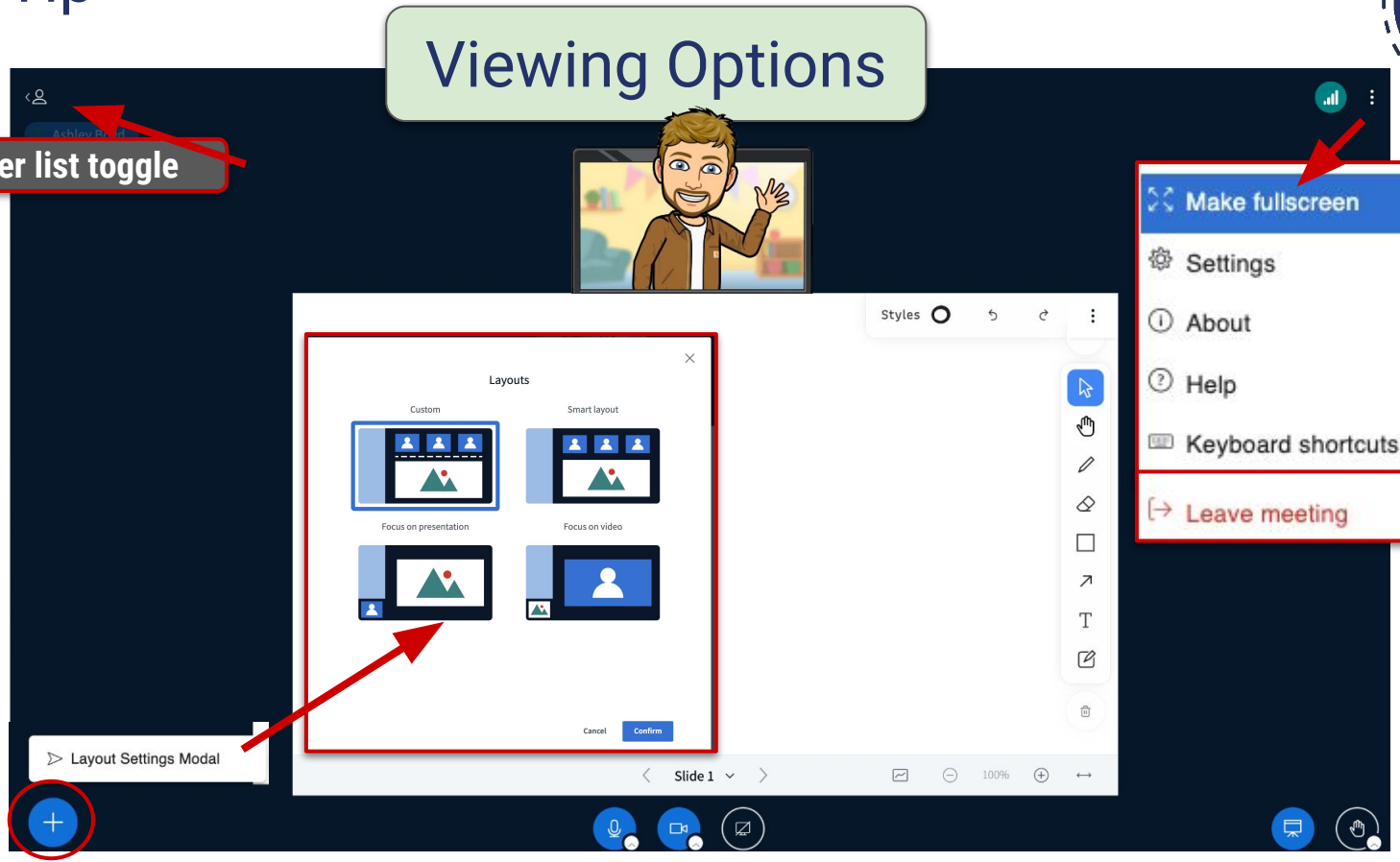
More Math For More People

Opening

Algebra Tile Virtual Learning Event



Tech Tip


Viewing Options
User list toggle
Make fullscreen
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Keyboard shortcuts
Leave meeting
Styles
Layouts
Custom
Smart layout
Focus on presentation
Focus on video
Cancel
Confirm
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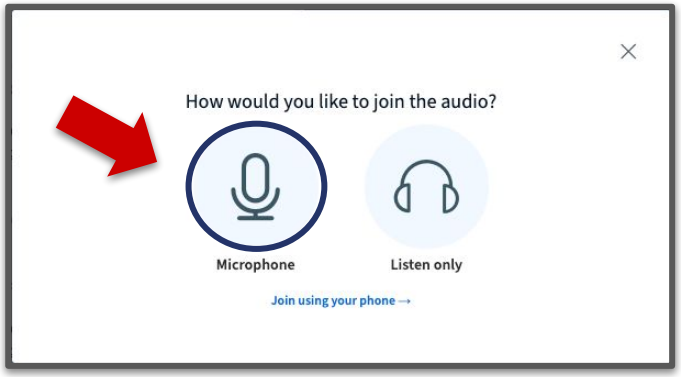
Slide 1
100%

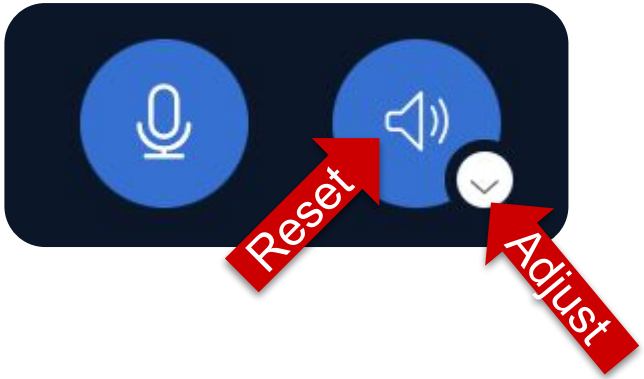
Tech Tip

Audio



Join with microphone

Troubleshooting

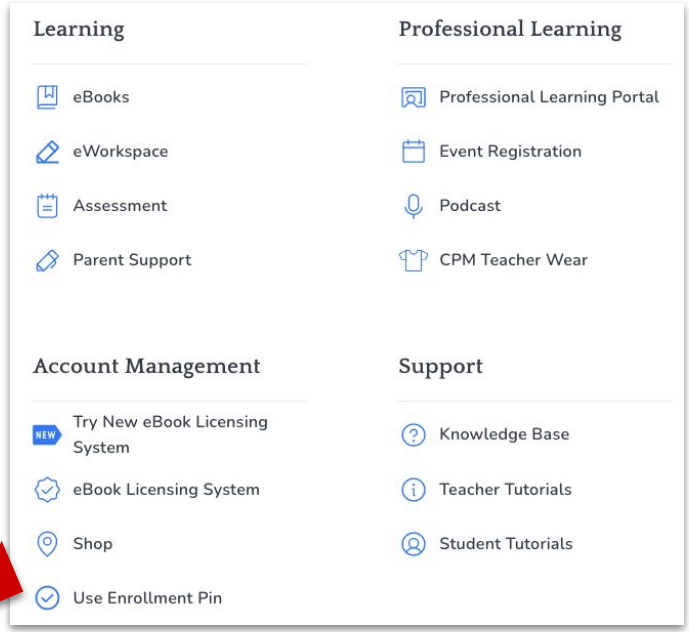


Use options below presentation to troubleshoot audio issues.

eBook

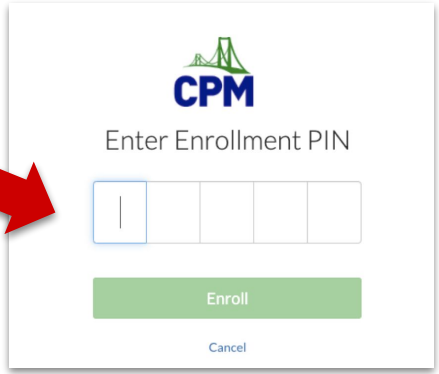
Enrollment steps

1st **my.cpm.org**



2nd

3rd



Steps to enroll in eBook:

1. Go to [my.cpm.org](my.cpm.org)
2. Click “Use Enrollment Pin” under Account Management
3. Enter the enrollment pin **(In public chat)**

Opening

Outcomes

Participants will:

Become familiar with algebra tiles.

Use the area model to multiply and factor polynomials, complete the square and divide polynomials.

Learn how to transition from concrete (manipulatives) to abstract (symbolic notation).

Opening

Agenda

+ Opening
+ Algebra Tiles - What are they?
+ Combining Like Terms

+ Multiplying and factoring polynomials
+ Completing the Square
+ Polynomial Division
+ Closure

Opening

CPM's Equity Principles

The goal of teaching is to help all students transition from dependent to independent learners.

Relationships are of vital importance.

Student uniqueness is an asset, not a deficit.

Reflection is a crucial part of growth.

Welcome

Working Agreements

Be willing to take **risks.**

Have a **visionary** mindset.

Stay **engaged.**

Explore and reflect on our **beliefs.**

Give **grace** to others and ourselves.

Change takes time, effort, and support!

Algebra Tiles - What are they?

Teacher

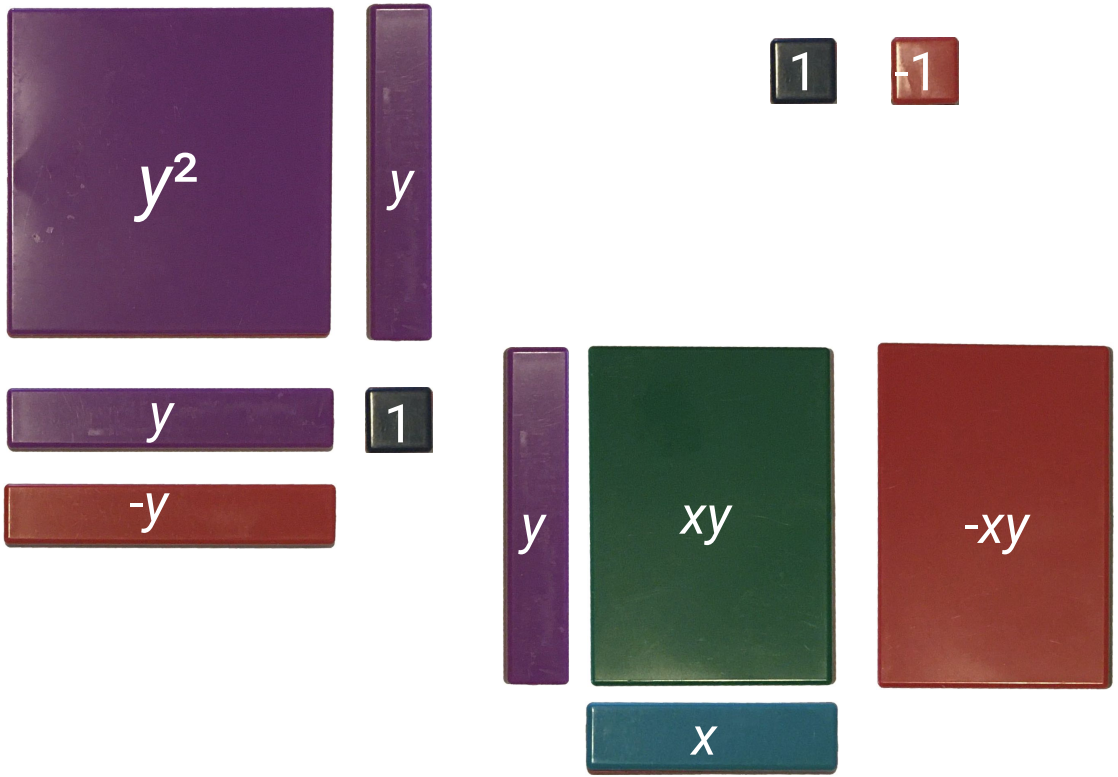
Icebreaker

What do you notice?

What do you wonder?

Algebra Tiles - What are They?

Naming of the Tiles

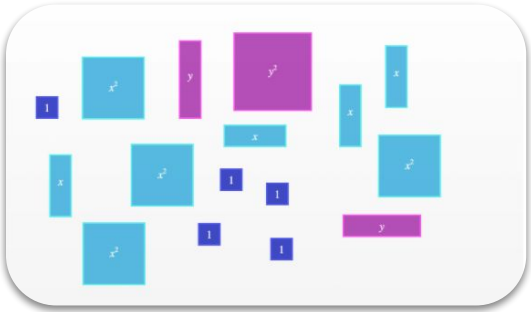


Algebraic Expressions

Explore: Combining Like Terms

Teacher

1. Please open Lesson 4.3.1 in **Core Connections 2.**
    a. Click on eBook tab
    b. Click on CC2
    c. Click on Chapter 4
    d. Click on Lesson 4.3.1



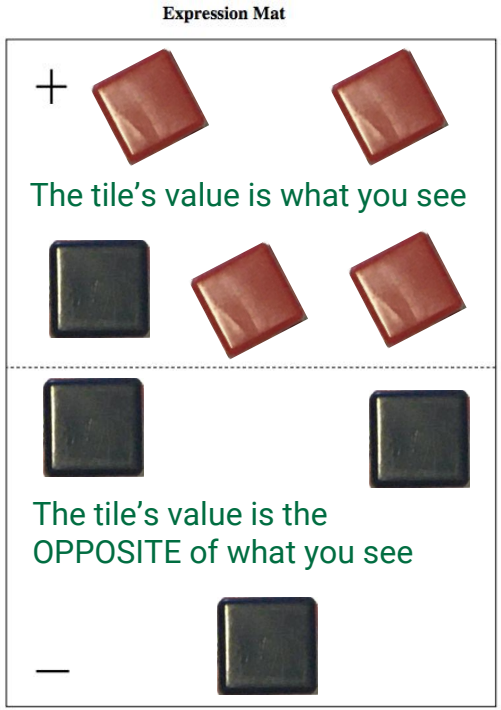
Expression Mats

Building with Opposite Space

Teacher

One expression mat, **two** regions

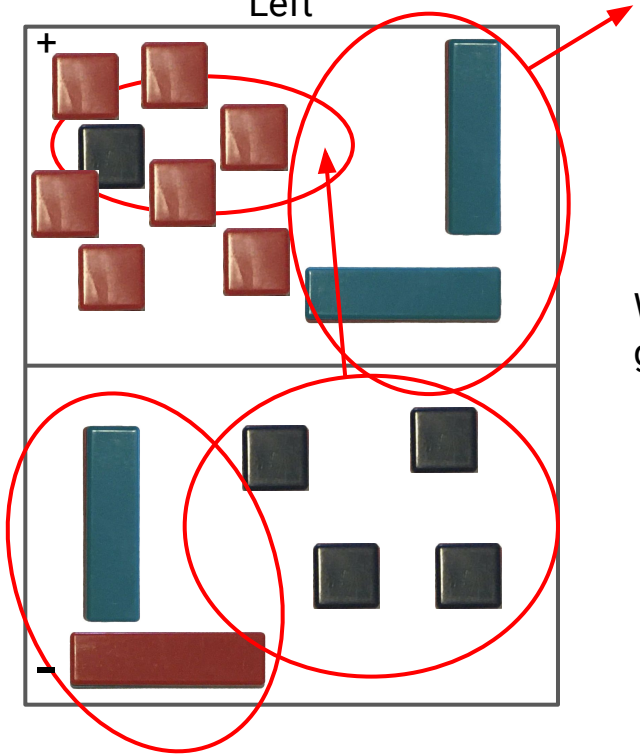
Value -3 can be shown many different ways



Comparison Mats

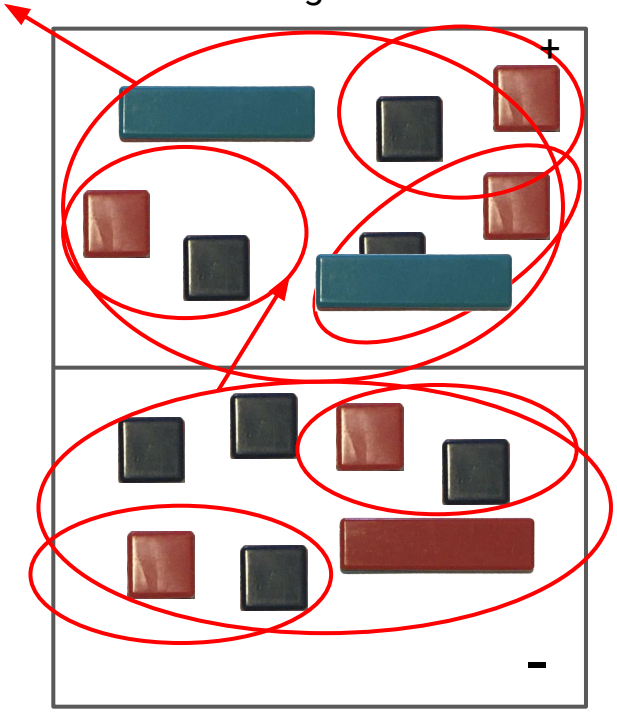
Which is Greater?

Left



Which is greater?

Right



Equation Mats

Solving Equations

$x - 2 + 1 - (-2x + 1) = 5 - (-x + 1)$

Teacher

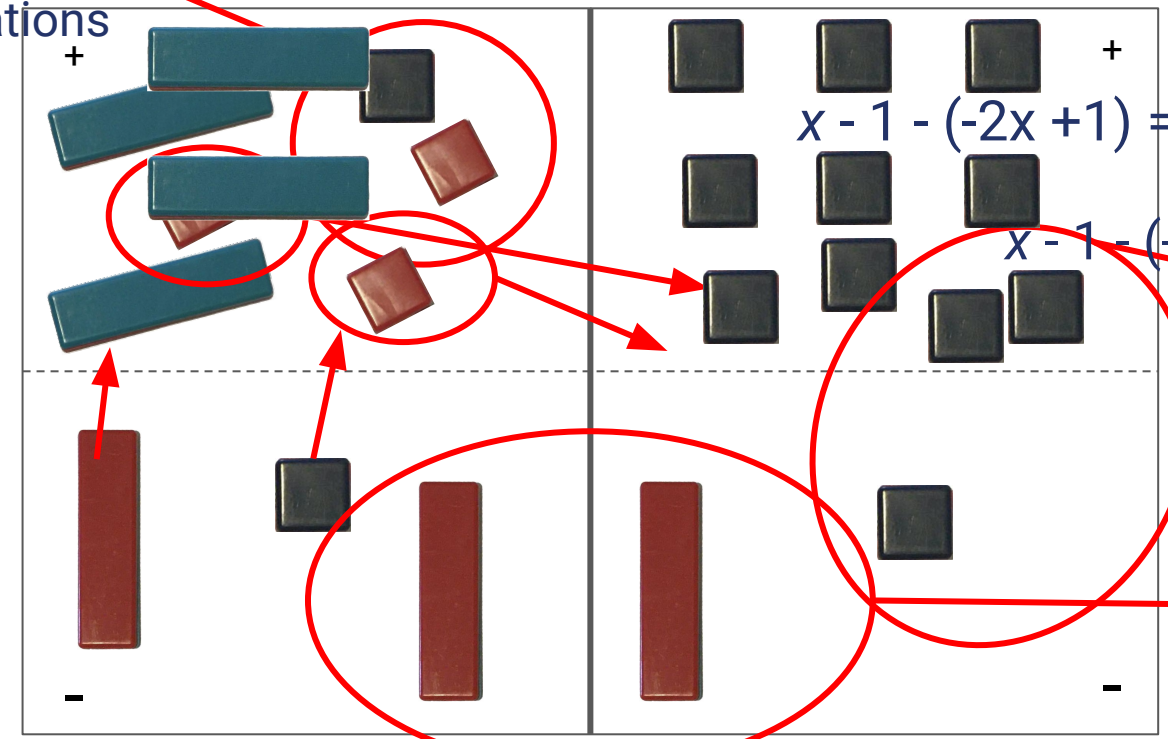
Zero Pairs

Removing Equal amounts

Flip

Flip again

Divide into equal amounts



$x - 1 - (-2x + 1) = 5 - (-x + 1)$

$x - 1 - (-x + 1) = 4$

$2x - 2 = 4$

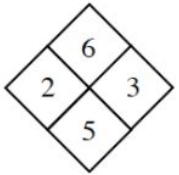
$2x = 6$

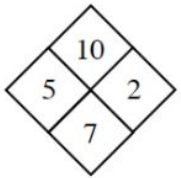
$x = 3$

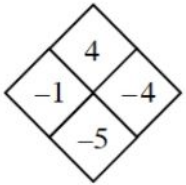
Multiplying and Factoring

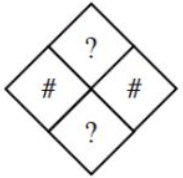
Diamond Problems

Look for a pattern in the first three diamonds below. How could you find the missing numbers (?) if you know the two numbers (#).

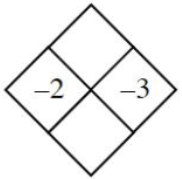


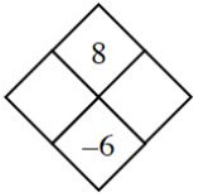






Use the pattern you discovered to complete each diamond problem below.



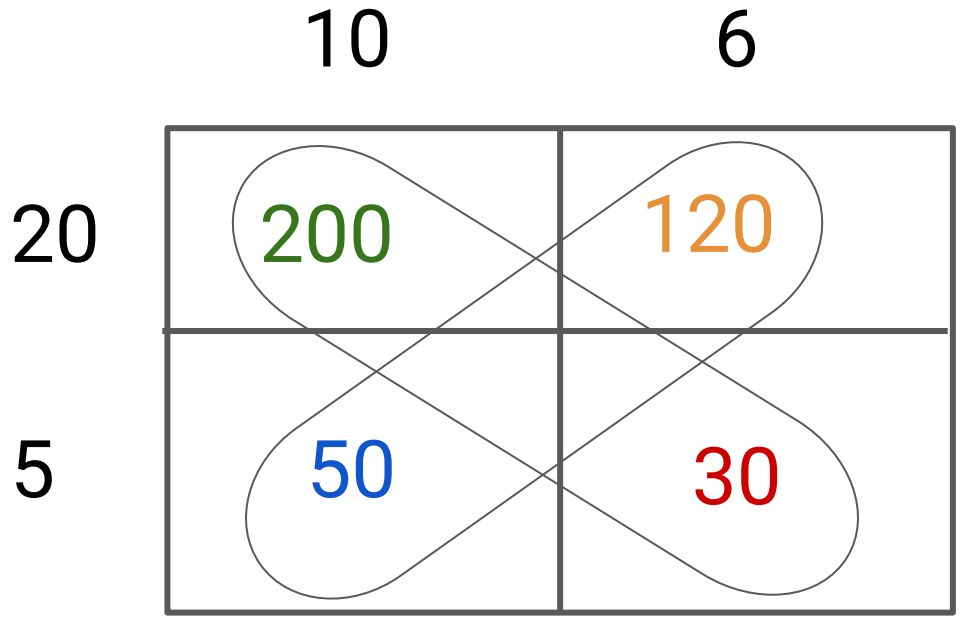


Multiplying and Factoring

Multiplying Using the Area Model

Teacher

16 x 25

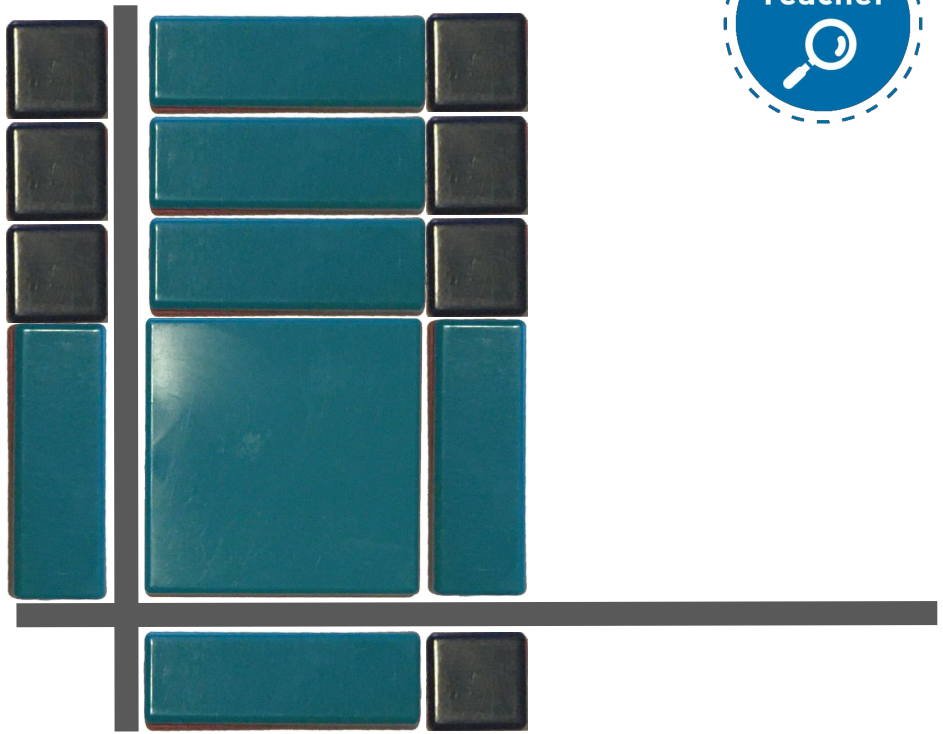


200
120
50
+30
400

Multiplying and Factoring

Multiplying Using the Area Model

Multiply $(x + 1)(x + 3)$ using the tiles.



Write the solution as (a product) = (a sum)

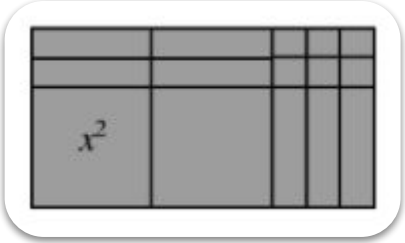
$(x^2 + 4x + 3) = (x + 1)(x + 3)$

Multiplying and Factoring

Practice

Teacher

1. Click on the Google Slide link posted in the chat.
2. Set your status to a thumbs up once you have opened the link.

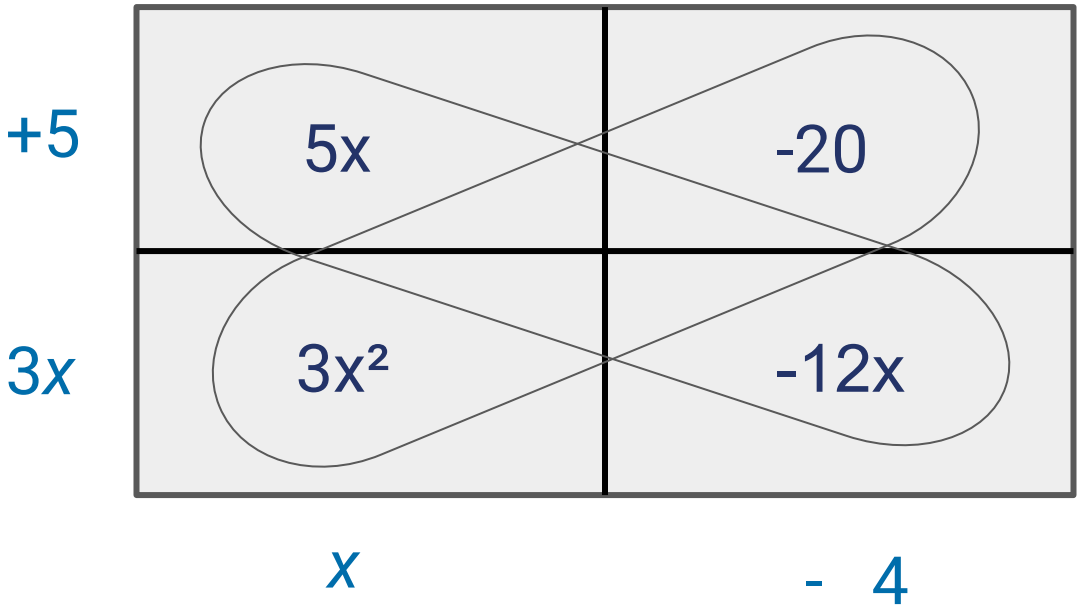


Multiplying and Factoring

Transitioning to Generic Rectangles

Teacher

$(3x + 5)(x - 4) = 3x^2 - 7x - 20$



Screen Break

Teacher

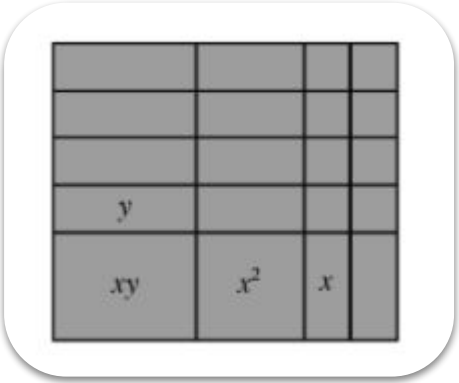
Take a 5 min break

Multiplying and Factoring

Factoring Using Algebra Tiles

Teacher

1. Click on the Google Slide link posted in the chat.
2. Set your status to a thumbs up once you have opened the link.

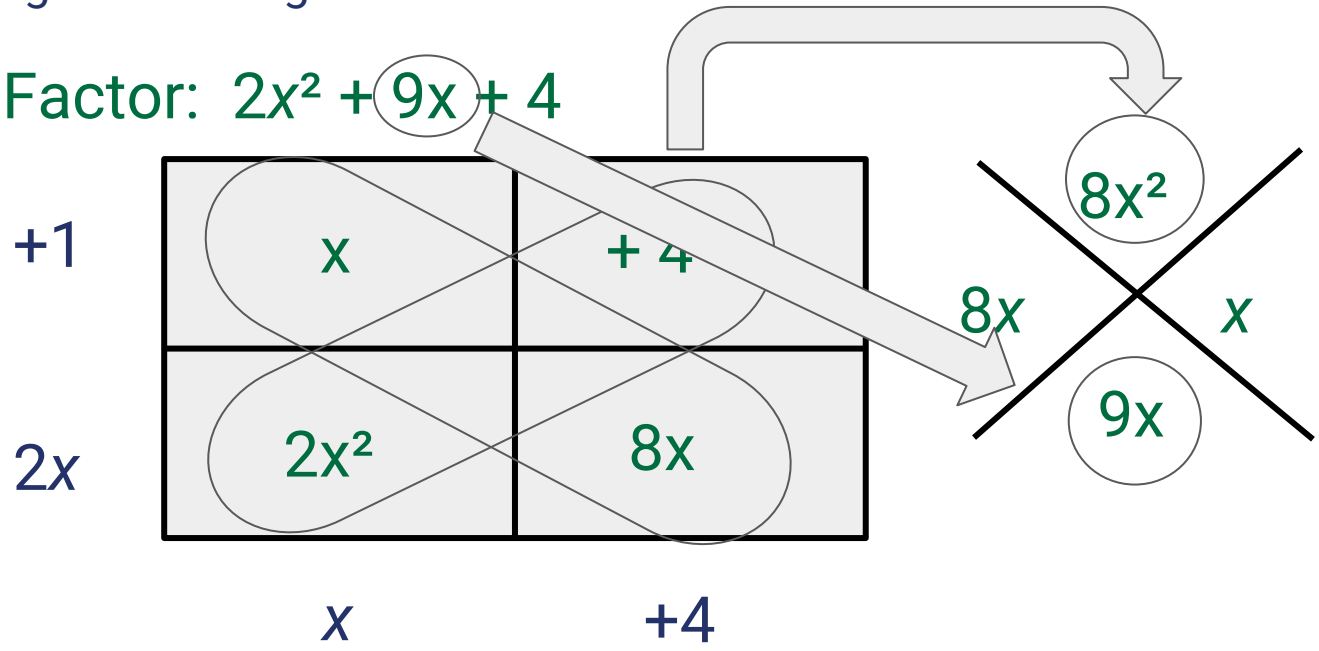


Multiplying and Factoring

Factoring Without Algebra Tiles

Teacher

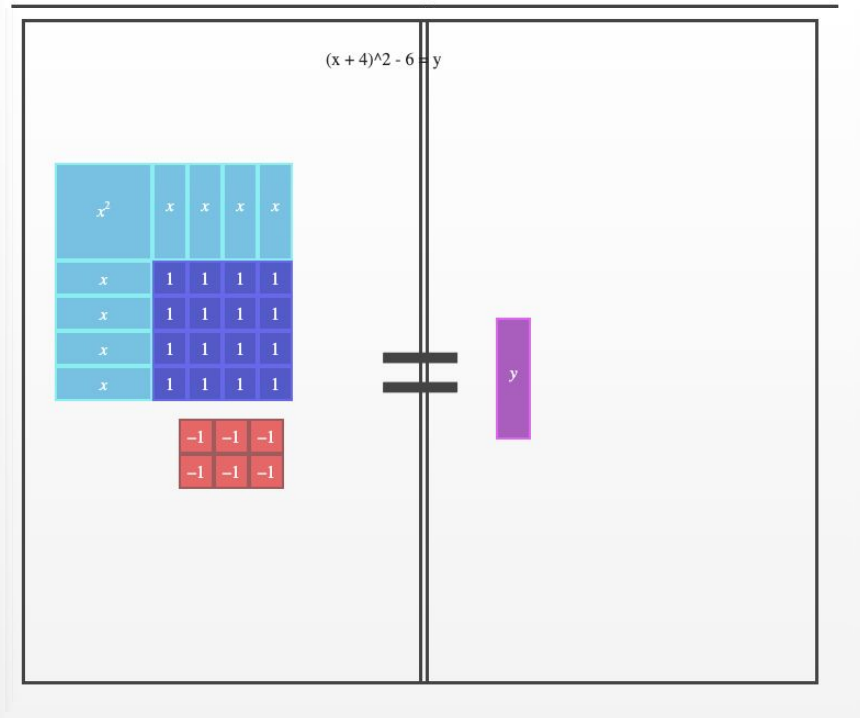
Factor: $2x^2 + 9x + 4$



Answer: $2x^2 + 9x + 4 = (2x + 1)(x + 4)$

Completing the Square

Completing the Square



$x^2 + 8x + 10 = y$

$(x^2 + 8x + 10)$ **+ 6** $= y$ **+ 6**

$(x^2 + 8x + 16) = y + 6$

$(x + 4)^2 = y + 6$

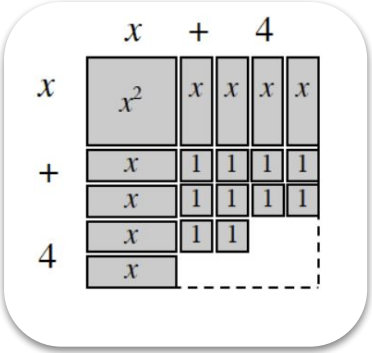
$(x + 4)^2 - 6 = y$

Completing the Square

Practice

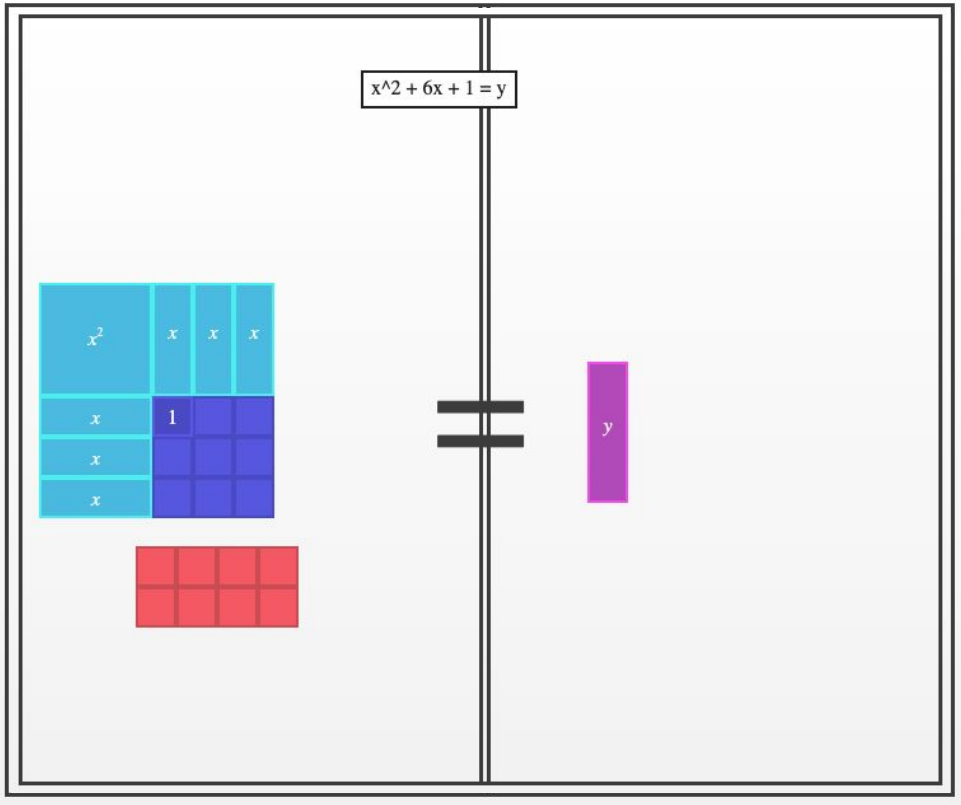
Teacher

1. Click on the link posted in the Public Chat.
2. You will have 5 minutes to practice a Completing the Square problem.
3. This will be completed individually.



Completing the Square

How did you do?



$x^2 + 6x + 1 = y$

$(x^2 + 6x + 1)$ **+ 8** $= y$ **+ 8**

$(x^2 + 6x + 9) = y + 8$

$(x + 3)^2 = y + 8$

$(x + 3)^2 - 8 = y$

Polynomial Division

1. Please open Lesson 3.1.4 in **Precalculus.**
    a. Click on eBook tab
    b. Click on Precalculus
    c. Click on Chapter 3
    d. Click on Lesson 3.1.4

Using an **area model**:

	x^3	$-4x^2$	$-8x$	$+2$	Remainder
x	x^4	$-4x^3$	$-8x^2$	$+2x$	3
-2	$-2x^3$	$+8x^2$	$+16x$	-4	
x^4	$-6x^3$	$+0x^2$	$+18x$	-1	

Answer: $x^3 - 4x^2 - 8x + 2 + \frac{3}{x-2}$

Polynomial Division

Debrief

Teacher

$$\frac{6x^3 + 7x^2 - 16x + 10}{2x + 5} = (2x + 5)\ (____?____) = 6x^3 + 7x^2 - 16x + 10$$

x	$3x^2$	$-4x$	2	
$2x$	$6x^3$	$-8x^2$	$4x$	0
5	$15x^2$	$-20x$	$+10$	

$6x^3$ $+7x^2$ $-16x$ $+10$

Solution: $3x^2 - 4x + 2$

Closure

Outcomes

Participants will:

Become familiar with algebra tiles.

Use the area model to multiply and factor polynomials, complete the square and divide polynomials.

Learn how to transition from concrete (manipulatives) to abstract (symbolic notation).

Closure

Yarn Challenge
What is your Chocolate Personality?
A-B-C That's Me!
Shaded
Picture 1
Picture 2
Picture 3
Phil
Katie C
Ashley
Jas
Sam
Carlos
Patrick

Closure

- **Parking Lot**
- **Attendance & Feedback**

Either scan the QR code

OR

Enter passcode in the portal

XXXXXX

PUT QR Code HERE

Text Font: Roboto

Title Font Size: 24

Subtitle Font Size: 18

Color coding:

- **Teacher Lens**: 006DAB
- **Learning Log**: 006DAB
- **Student Lens**: 41AD49
- **Housekeeping**: 233368
- **Content Module**: 006D41
- **Thread**: 006D41

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Note: Drop zones of icons on layouts are not moveable.

HOUSEKEEPING

ANCHOR PAGE

WELCOME

PUZZLE

TEAM GOAL

TEACHER LENS

LEARNING LOG

THREAD

CONTENT MODULE

MATH GOAL

STUDENT LENS

EQUITY LENS

ASSESSMENT

PRODUCTIVE STRUGGLE

RESEARCH PILLARS

MSP

COLLABORATIVE LEARNING

PBL

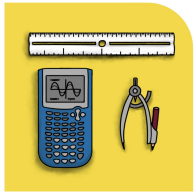
STUDY TEAMS

LEARNING TARGET

TASK CARD

TEAM ROLES ALL

RESOURCE MANAGER



TASK MANAGER

REPORTER RECORDER

FACILITATOR

IMPLEMENTATION ACTION PLAN

TEAM ROOMS

IMPLEMENTATION PROGRESS TOOL

STTS