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standards-based math curriculum for grades 6-algebra 1



Math curriculum designed to meet students' needs and empower teachers.

Grade Level Curriculum: student-friendly guided notes, hands-on activities, teaching slides (coming August 2023), and teacher planning resources

Supplemental Digital Components: digital activities, teaching slides, Google Form™ assessments

Student Video Library: professional quality videos aligned to student handouts

### equations and inequalities unit

# algebra 1 ccss planning guide

A MANEUVERING THE MIDDLE® RESOURCE

#### what is it?

This resource has been designed to model the process presented in the math training, "A Step-by-Step Plan for Unfinished Learning". Please use the information provided to jump start your planning for the school year.

### how does it work?

A planning guide has been included for each of the key topics in Unit 1: Equations and Inequalities. Each guide will help you prepare for formative assessment opportunities, common student misconceptions, instructional strategies you can use to reach your students and suggestions for utilizing activities to best support your students' needs.

PAGE	TOPIC	RESOURCE
5	Simplifying Expressions	Planning Guide
7	Solving Equations and Inequalities	Planning Guide
9	Simplifying Expressions	Maze Activity
14	Solving Equations	Scavenger Hunt Activity

#### learn more about All Access

The hands-on activities included are a brief sample of one element of our All Access membership. All Access is math curriculum designed to meet students' needs and empower teachers. You can find out more by clicking the link below.

#### maneuveringthemiddle.com/math-curriculum

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## simplifying expressions

goal	prior skills	related materials
Students should be able to simplify expressions by combining like terms and using the distributive property.	In previous grades, students identified and combined like terms.	<ul> <li>Unit 1, Student Handout 1</li> <li>Unit 1, Student Handout 2</li> </ul>
identifying like terms	simplifying by combining like terms	simplifying by distributing

	laeimym	g interreting	simplifying by co		sinpinying a	y alstriballig
formative assessments	TEPMS           -3c and 5c <sup>2</sup> $\frac{1}{4}$ and 20           8.5x and 8.5y           100p and -p           student handout 1	LIKE OB ONFIKES	-x + 6y - 9 student handout 1 $-4\frac{1}{2}x + 15$ student handout 1	$x - 2y - 4y$ $+ \frac{7}{2}x - 23$	$\frac{3}{4}$ ( 16m student handout 2 14 - 6( student handout 2	– 5) – <u>3</u> 3x – 1.5)
non misconceptions	Students may identify variable but different terms (ex. 1) or terms coefficient as like terr <u>example 1</u> -3c and 5c <sup>2</sup>	y terms with the same exponents as like s with the same ms (ex. 2). example 2 8.5x and 8.5y	Students may not inclu term (ex. 1) or may use combine like terms bee experience solving equ example 1 5x + 12 – 8x 13x + 12	ude the sign in front of a e inverse operations to cause of previous lations (ex. 2). example 2 $\frac{14y + 3 + 9y}{-9y - 9y}$ $\frac{-9y - 9y}{5y + 3}$	Students may only distinside parentheses (examply integer rules with $ \underbrace{\text{example 1}}_{-5(2x - 3)} \\ -10x - 3 $	tribute to the first term . 1) or may incorrectly n multiplication (ex. 2) example 2 -5(2x - 3) -10x - 15
comr				-, -		

## simplifying expressions

	identifying like terms	simplifying by combining like terms	simplifying by distributing
gies	<b>model it:</b> allow students time to explore the idea of like and unlike terms with a concrete example such as algebra tiles	<b>organize it:</b> encourage students to color code like terms or put a unique shape around like terms as a first step	<b>picture it:</b> use an area model or the box method to demonstrate the distributive property
instructional strate	x <sup>2</sup> -x <sup>2</sup> x -1 1	organize it: encourage students to highlight or underline the coefficient of variable terms before combining to avoid errors such as forgetting the sign or thinking that a stand- alone variable has a coefficient value of 1 3x - 12 + x + 19	$6(2x - 4) \longrightarrow 6 \qquad 12x \qquad -24$
extra practice and resources	Write a term of your choice on the board. Then, allow students to generate their own examples and non-examples of like terms with the term you provided. Consider allowing students to use dry erase boards to show their responses.	<ul> <li>Simplifying Expressions Maze Activities*</li> <li>Consider the differences in the maze activities meets the needs of your students:</li> <li>Maze #1: The first maze in the activity proposed but does not include the distributive proposed of the distributive proposed of the second maze includes expression of the second ma</li></ul>	to differentiate and choose the maze that best ractices simplifying expressions with 3-4 terms perty. pressions that require both distributing and

\*Simplifying Expressions Maze Activities are included in this PDF on pages 9-13.

### solving equations and inequalities •

	<b>goal</b> Students should be able to solve linear multi-step equations and inequalities with variables on both sides.	In previous grades equations with vari	<b>skills</b> s, students solved ables on both side.	related materials Unit 1, Student Handouts 3-8
	solving multi-step equations ar	nd inequalities	solving e with v	quations and inequalities variables on both sides
formative assessments	-(2x + 5) + 14 = 22 student handout 3 -2x + 6(x - 8) + 10 < 2 student handout 6		5 student he <del>3</del> <del>7</del> (−2 student he	$5(k + 14) = \frac{1}{5}(20k - 80)$ andout 4 21 + 14x) < 18x + 10.5 + x andout 7
	Students may combine a like term with the co parentheses before distributing (ex. 1) or make	onstant in front of the ke errors when	Students may use incorregulations with rationals	rect inverse operations when solving , especially when the coefficient is a fraction

equations with rationals, especially when the coefficient is a fraction (ex. 1), or may struggle to remember when to flip the inequality symbol (ex. 2).

otions	distributing, especially with integ	gers (ex. 2).	(ex. 1), or may struggle to remember symbol (ex. 2).	er when to flip the inequality
Jcel	example 1	example 2	example 1	example 2
common miscor	$\frac{2+4}{6}(5-3x) = 100$ $\frac{6}{5}(5-3x) = 100$	-(-3 <sub>x</sub> + 12) – 8 > 18 3 <sub>x</sub> + 12 – 8 > 18	$-18 = \frac{1}{2}x$ $-9 = x$	2.5x ≥ -12.5 x ≤ -5
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## solving equations and inequalities =

	solving multi-step equations and inequalities	solving equations and inequalities with variables on both sides
instructional strategies	<ul> <li>rephrase it: instead of only instructing students to "solve" an equation, considering asking "which value makes the equation true" to reinforce the goal in solving as well as the fact that students can check their solutions after solving</li> <li>organize it: encourage students to pause and become familiar with the equation before jumping in to solve; model the habit of looking for opportunities to "clean up" one side of the equation by combining like terms and distributing first</li> </ul>	<ul> <li>model it: use algebra tiles as a concrete way to introduce solving basic equations with variables on both sides before moving on to more complicated equations</li> <li>organize it: draw a line through the equal sign to separate the two sides of the equation</li> <li>rephrase it: have students summarize real-world equation and inequality situations with words before using variables and symbols</li> </ul>
extra practice and resources	<ul> <li>Solving Multi-Step Equations Solve and Color*</li> <li>This activity may be especially beneficial for struggling students as it allows practice with the following skills: <ul> <li>Solving two-step equations (A, B, F, H, I, L, N, P)</li> <li>Solving equations involving the distributive property (D, G, K, O)</li> <li>Solving equations involving combining like terms (C, E, J, M)</li> </ul> </li> </ul>	<ul> <li>Solving Equations Scavenger Hunt**</li> <li>Consider using the scavenger hunt in two different ways. First, as a traditional scavenger hunt to promote movement and collaboration. Secondly, as a set of cards that can be scaffolded in a small group setting. The skills practiced on each card included in the scavenger hunt are listed below: <ul> <li>Variables on one side of the equation (Card A)</li> <li>Variables on both sides (Cards C and J)</li> <li>Variables on both sides and combining like terms (Card H)</li> <li>Variables on both sides and distributing (Cards B, D, E, F, G, I)</li> </ul> </li> </ul>

\*Solving Multi-Step Equations Solve and Color is included as a part of the Algebra 1 All Access Membership. \*\*Solving Equations Scavenger Hunt is included in this PDF on pages 14-23.

# **SIMPLIFYING EXPRESSIONS** maze activity

Students will be able to simplify expressions by combining like terms with and without distributing.



A.5A\* Students will solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides

\*While simplifying expressions is not stated in the standard, it is a prerequisite skill to solving multi-step linear equations in which simplifying and combining like terms is necessary

**Ideas for Implementation:** This activity assesses a student's ability to simplify expressions. There are two different mazes included:

- 1. Maze #1 practices combining like terms without distributing
- 2. Maze #2 practices combining like terms with distributing

### Instructions:

- 1. Print and copy a maze (or both mazes) for each student.
- 2. Students will solve each problem. The correct answers will lead them correctly to the finish.

**Notes:** I normally have students shade the path with a highlighter or colored pencils for easy grading. This activity is best used as an individual assessment and is great for early finishers.









# SOLVING EQUATIONS scavenger hunt

Students will be able to solve one variable equations, including those with the distributive property and variables on both sides.



A.5A solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides



A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

**Ideas for Implementation:** Math scavenger hunts are an awesome way to get students out of their seats and working. They're also super easy to prep and facilitate for the teacher! Students love being able to get up and move around the classroom and are more engaged than with a worksheet.

#### Directions:

- 1. Print each problem page on card stock and laminate if possible.
- 2. Post the pages around the room/hall/library.
- 3. Students receive a recording sheet to show their work in the appropriate box.
- 4. Students begin at any letter and work that problem. They then look for the solution at the top right of another card. Once the solution is found, students work the problem on the card.
- 5. Students continue until they end up at the card where they began.

### Teacher Tips:

- 1. If you have a class set of clip boards or dry erase boards, it will be easier for students to write.
- 2. This activity works best in pairs or groups of three so that students can discuss with one another.





$$X = -.8$$
What value of x makes the following  
equation true?  

$$\frac{2}{3}(x - 9) = \frac{1}{3}x + 19$$
What value of x makes the following equation.  

$$X = 6$$
Find the solution to the following equation.  

$$5.6x + 18 - 1.3x = .9(x - .4)$$



$$\begin{array}{l} \textbf{X} = -\textbf{13} \\ \textbf{X} = -\textbf{13} \\ \textbf{What value of x makes the following equation true?} \\ \frac{3}{4}(x-16) = \frac{5}{4}(2x-32) \\ \textbf{W} \\ \textbf{X} = \textbf{4.2} \\ \textbf{W} \\ \textbf{X} = \textbf{4.2} \\ \textbf{K} \\ \textbf{K} \\ \textbf{K} = \textbf{4.2} \\ \textbf{K} \\$$

# SOLVING EQUATIONS SCAVENGER HUNT

Show all your work in the appropriate box below.

Α		₿	
Solution:	_Next Card:	Solution:	_Next Card:
С		D	
Solution:	_Next Card:	Solution:	_Next Card:

-		•	
0.1.1.		0.1.1.	
Solution:	_ Next Cara:	Solution:	_ Next Cara:
G		Ц	
<b>C</b>			
- · · ·			
Solution:	_Next Card:	Solution:	_Next Card:
Т		J	
<b>±</b>		U	
Solution:	_ Next Card:	Solution:	_Next Card:

Date \_\_\_\_\_ Pd \_\_\_\_\_

# SOLVING EQUATIONS SCAVENGER HUNT

Show all your work in the appropriate box below.

Α		₽	
Solution: <u>x = 6</u>	Next Card:F	Solution: <u>x = 13</u> Next Card:	H
С		D	

