Simplifying Algebraic Expressions

Strand: Patterns, Functions, and Algebra

Topic: Simplify algebraic expressions in one variable.

Primary SOL: 8.14 The student will

          b) simplify algebraic expressions in one variable

Related SOL: 8.17

Materials

- Simplifying Algebraic Expressions Grouping Cards (attached)
- Algebraic Expressions (attached)
- Simplifying Algebraic Expressions Exploration Sheet (attached)
- Scissors
- Glue

Vocabulary

algebraic expression, coefficient, constant, distributive property, like terms, simplify, term, variable (earlier grades)

Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Have the Simplifying Algebraic Expressions Grouping Cards cut out before class. Pass the cards out so that each student gets one term.
2. Have students find their like terms.
3. Distribute the Simplifying Algebraic Expressions Explorations Sheet.
4. Have students record their team members' names and terms.
5. Then, have students create an algebraic expression using their cards. Have students simplify the expression they made.
6. Have the groups share the algebraic expressions before and after they have been simplified.
7. Have students remain in these groups to complete the Simplifying Algebraic Expressions Explorations Sheet.
8. Students will need scissors and glue to complete the activity.

Assessment

- **Questions**
  - What properties do you apply while simplifying expressions?
  - What differentiates an expression from an equation? What is the difference between simplifying an expression and solving an expression?

- **Journal/writing prompts**
  - Explain what it means to combine like terms. Provide examples with your explanation.

- Create an expression for your partner to simplify. Identify the properties your partner used to simplify your expression.

- **Other Assessments (include informal assessment ideas)**
  - Practice simplifying the expressions given throughout the activity, as a class on dry-erase boards or on an electronic device. Have students simplify and share.
  - Have groups share the expression they found the most difficult to simplify and explain why, to the class.

Extensions and Connections (for all students)

- Have students apply the concept of simplifying expressions with equations.
- Review the properties of real numbers and identify which properties are often applied when simplifying algebraic expressions.

Strategies for Differentiation

- Allow students to work independently or in smaller pairs.
- Use the Algebraic Expressions Grouping Cards methodically to create leveled groups.
- Create additional sorting cards with varied levels of difficulty.
- Challenge your students who master the concept quickly to apply the distributive property and the concept of combining like terms to create and solve multistep equations.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

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Simplifying Algebraic Expressions Grouping Cards

Print on card stock and cut out.

$-8x$	$2x$	$-3x$	$-x$
$-2y$	$-\dfrac{1}{2}y$	$-20y$	$-y$
$5z$	$-6z$	$-2z$	$-z$
$9m$	$-2m$	$-5m$	$-m$
-2	4	-6	-3
$-3z$	$5z$	$-3z$	$-z$

Algebraic Expressions

1.	$-8q$	$12q$	-13	$9q$	2	$-8q$
2.	$-10x$	$-2y$	4	$3y$	-10	$-4y$
3.	$5m$	4	$-m$	$-9m$	$\dfrac{3}{5}$	$-15m$
4.	$-8b$	$10b$	$-5b$	11	$3b$	-20
5.	$-4w$	$3z$	-12	$19w$	$-8w$	$10z$

Simplifying Algebraic Expressions Exploration

Name _____ **Date** _____

Team Members:

Name	Term

Use your team members' cards to create and simplify an algebraic expression.

Expression created: _____

Simplified: _____

Directions:
1. Cut out the expressions given.
2. Group your like terms and combine.
3. Record the simplified algebraic expressions.

Sample expression: $-7y + 4 - 13 + 9y - 8y + 2$

Cut and paste here:

$-7y$	$+9y$	$-8y$	$+4$	-13	$+2$

Simplify and paste here:

$$-6y - 7$$

1. Expression: $-8q + 12q - 13 + 9q + 2 - 8q$

Cut and paste here:

Simplify here:

2. Expression: $-10x - 2y + 4 + 3y - 10 - 4y$

Cut and paste here:

Simplify here:

3. Expression: $5m + 4 - m - 9m + \frac{3}{5} - 15m$

Cut and paste here:

Simplify here:

4. Expression: $-8b + 10b - 5b + 11 + 3b - 20$

Cut and paste here:

Simplify here:

5. Expression: $-4w + 3z - 12 + 19w - 82 + 10z$

Cut and paste here:

Simplify here:

Assessment Questions:

Simplify the expressions given below.

$-3x + 2w + 5w - 4x - 3 + 9x$	$6s + 2s - 16 - 19s + 18 + 15s$	$22x - 16x + \dfrac{1}{4} - 10x - \dfrac{5}{8} + 10x$

Apply the properties of real numbers to simplify the expressions given below.

$8(-3 + 4w) + 10w - 2$	$10a + 4 + 5(2a - 6a)$	$-\dfrac{1}{2} + (4m + 2) + 8m - 12$

Review the terms below.

16y				
	−8x	2y		−3y
			5x	12x
−2x	5			14
		−8		
y	12	−x	x	9

How many different terms are shown? _____

List the constants shown: _____

Sum them. _____

List the *x* terms shown. _____

Sum them. _____

List the *y* terms shown. _____

Record the simplified algebraic expression based on the terms shown.

_____