Doing What Works
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Assignment: Simplifying Expressions—*Twin Groves Middle School, Illinois*
Lesson Plan: Simplifying Expressions
Objective – Students will simplify expressions by combining like terms.

Procedure – **Opener:** Review distributive property 3(x + 2) –2(x – 4) –(5x + 3) –(4 – 2x) 3x (x + 5)

Vocabulary: Discuss what an expression is and when we write them. Discuss parts of expression – coefficient, terms, like terms, constant

Prior Knowledge: Display both a simplified expression and one that is not simplified to see if they can see a difference. Discuss why you want to simplify.

Sample Problems: Go through sample problems, showing on board and then give students one to try on their white board, send students to board in front of room. Problems should build up in difficulty. Discuss proper answer form.
- one like variable
    - 8a + 2a 9p – 5p
- two different variables
    - 4x + 8y – 6x + 2y
- different variables and constants (be sure to include terms with coefficient of 1 and -1 in both the problem and in answers)
    - 8c – 7a + 3 – 2c + 6a
- distribute and simplify
    - 5(2x + 6) – 8x
- multiple distributive and simplify
    - 6(2x – 3) – 5(3x + 6) + 7x
- same base variable, different exponents
    - 8 + 4x + 3x2 – x + 5x3 – x2 + 2x3 – 1
- if time allows application with perimeter
- Find the perimeter of a rectangle with the length of 3x – 5 and the width of x + 3

Helpful hints for struggling students
- use different colors to highlight like terms
- circle or box off like terms

Generate set of rules with student: - scan problem distribute combine like terms - order answer descending powers alphabetical constant term last

Pass out worksheet to do in pairs. Discuss pair answers

Pass out practice worksheet.

Simplifying Expressions – Problem Worksheet
1. 4x + 7x
2. 9y – 12y
3. 3x + 7y – x – 4y
4. 8r – 3q + q – 7r + 5q
5. 5f – 4 - 3d + 2 – 8f – 6 + d
6. –7k + 8m - 2 + 6k + 2 – 6m
7. 4 (3n + 5) – 10n
8. k + 2 – 3(6k – 5)
9. 8(3x + 4) + 5(7x – 8) + 2x
10. –2(5x – 4) – 3(2x + 8) – 7x
11. 5x + 6x2 + 9x + 7x3 – 3x2
12. 4x(x + 6) + 7x – 3(x – 5) + 6x2
**13. –x + 4x(7 – 3x) + 3x(2x + 4) – (4 – 2x) + 5
**14. Find the perimeter of a rectangle with the length of 2y – 4 and the width of x + 3.

** Challenge problems

Simplifying Expressions – Homework
1. 11x + 7x
2. 15y – 20 y
3. 7x + 5y – x – 2y
4. 9x – 4m + m – 6x + 5m
5. 8e – 6 -2c + 4 – 10e – 5 + c
6. –8x + 7m – 5 + 7x + 3 – 3m
7. 5(2x + 7) – 8x
8. n + 4 – 5(3n – 6)
9. 3(7x + 6) + 4(9x – 3) + 4x
10. –3 (7x – 6) – 5(4x + 7) – 9x
11. 4x + 7x2 + 3x + 9x3 – 4x2
12. 5x (x + 7) + 8x – 4 (x – 3) + 5x2
13. Write an expression that needs to be simplified and then simplify it.

Activity: Create a universally designed version of the above lesson

UDL Planning	My ideas
Representation- adaptations in materials (e.g., adapt for sensory impairments)	

Expression- how will student show learning (e.g., use of assistive technology; alternative project)	
Engagement- how will student participate in the activity	