Teacher Lesson Plan

Standard: **A-APR.A.1: Perform arithmetic operations on polynomials**. Understand that polynomials form a system analogous to the integers; namely, they are closed under the operations of addition, subtraction, and multiplication. Add, subtract, and multiply polynomials.

Student Learning Outcomes (SLOs):

- Tier 1
  - #1 – The student can explain the concept of a monomial and provide evidence to support their explanation.
  - #2 – The student can explain the concept of a polynomial and provide evidence to support their explanation.
- Tier 2
  - #15 – The student can multiply polynomials

Lesson Objectives:

1. The student will connect the standard algorithm for multi-digit multiplication with the distributive property by applying their understanding of collecting like terms. (Problems #3-10)
2. The student will begin to make conjectures about procedures for evaluating expressions of the form (a + b)(c + d) using the distributive property where a, b, c, and d are numerical values. Students will then test their conjectures. (Problems #11-34)
3. The student will abstract this process using algebraic expressions instead of purely numerical expressions. (Problems #35-58)
4. The student will multiply polynomials fluently. (Problems #59-80)

Lesson Activities:

Bellringer: Complete problems #1-2 individually.

Lesson Objective #1: Problems #3-10 – Think-Pair-Share

Lesson Objective #2: a. Problems #11-16 – Think-Pair-Share
b. Problems #17-26 – Collaborative Groups
c. Problems #27-34 – Think-Pair-Share

Lesson Objective #3: a. Problems #35-38 – Think-Pair-Share
b. Problems #39-58 – Collaborative Groups

Lesson Objective #4: Problems #59-80 – Collaborative Groups

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While students work, I will circulate to observe their work. I will make notes about student approaches that uncover the intended mathematical ideas, to facilitate whole-class discussion.

Notes for whole-class discussion (Problems #3-10)

Student(s)	Problem Number & Work to share

Notes for whole-class discussion (Problems #11-16)

Student(s)	Problem Number & Work to share

Notes for whole-class discussion (Problems #35-38)

Student(s)	Problem Number & Work to share

Lesson Summary and Wrap up:

In the summary the teacher will use the student work from Lesson Objectives 1, 2a, and 3a to revisit the pathway from the standard algorithm for multiplication, to like terms, to the distributive property, to multiplying polynomials.

Sample questions during the lesson summary:

1. How did you use the distributive property today?
2. How is multiplying polynomials similar to multiplying two-digit whole numbers? How is it different? How does <student>'s work show the similarity? How does <student>'s work show the difference?