

# Unit 2: Polynomials And Factoring

Content Area: **Mathematics**  
Course(s): **Algebra 8**  
Time Period: **October**  
Length: **4 weeks**  
Status: **Published**

## **Transfer**

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### **Big Idea: Polynomials & Factoring**

## **Enduring Understandings**

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You can represent algebraic expressions in many ways. When you add, subtract, multiply, divide and factor polynomials, you replace one expression with an equivalent expression.

The properties of real numbers are the basis of the laws of algebra. You can apply properties of real numbers, such as the Distributive Property, to polynomials

## **Essential Questions**

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In what scenarios can polynomial and rational functions be used to model real-life processes?

How are the properties of real numbers related to polynomials?

## **Critical Knowledge and Skills**

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## **Vocabulary**

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### **Vocabulary**

Binomial, Degree of a Monomial, Degree of a Polynomial, Difference of Two Squares, Exponent, Factoring by Grouping, Monomial, Perfect-Square Trinomial, Polynomial, Standard Form of a Polynomial, Trinomial

## **Learning Objectives**

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Classify, add, and subtract polynomials (A.APR.1)

Multiply powers with the same base (N.RN.1)

Multiply a monomial by a polynomial (A.APR.1)

Factor a monomial from a polynomial (A.SSE.1.b)

Multiply two binomials or a binomial by a trinomial (A.APR.1)

Apply polynomials to area, surface area, and volume, including cylinders, cones, and spheres (8.G.9)

Find the square of a binomial and to find the product of a sum and difference (A.APR.1)

Factor trinomials of the form  $x^2 + bx + c$  (A.SSE.1.a)

Factor trinomials of the form  $ax^2 + bx + c$  (A.SSE.1.a)

Factor perfect square trinomials and the differences of two squares (A.SSE.1.a)

Factor higher-degree polynomials by grouping (A.SSE.1.a)

## **Resources**

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[Illuminations Distributing & Factoring Using Area](#)

[TED Ed: Locker Riddle](#)

[Factoring Math Game](#)

[Khan Academy: Polynomials](#)

[Khan Academy: Factorization](#)

## **Standards**

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RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively and with reason.

CRP11. Use technology to enhance productivity.

9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.

9.1.8.C.5 Calculate the cost of borrowing various amounts of money using different types of credit (e.g., credit cards, installment loans, mortgages).

9.1.8.D.3 Differentiate among various investment options.

9.1.8.E.6 Compare the value of goods or services from different sellers when purchasing large quantities and small quantities.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.

8.2.8.C.8 Develop a proposal for a chosen solution that include models (physical, graphical or mathematical) to communicate the solution to peers.

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| MA.8.G.C      | Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.  |
| MA.8.G.C.9    | Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.   |
| MA.K-12.1     | Make sense of problems and persevere in solving them.  |
| MA.K-12.2     | Reason abstractly and quantitatively.  |
| MA.K-12.3     | Construct viable arguments and critique the reasoning of others.   |
| MA.K-12.4     | Model with mathematics.  |
| MA.K-12.7     | Look for and make use of structure.  |
| MA.K-12.8     | Look for and express regularity in repeated reasoning.   |
| MA.N-RN.A     | Extend the properties of exponents to rational exponents.  |
| MA.N-RN.A.1   | Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. |
| MA.A-APR.A.1  | 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.         |
| MA.A-SSE.A    | Interpret the structure of expressions   |
| MA.A-SSE.A.1a | Interpret parts of an expression, such as terms, factors, and coefficients.  |
| MA.A-SSE.A.1b | Interpret complicated expressions by viewing one or more of their parts as a single entity.  |