

Unit 4: Expressions and Equations

6th Grade Honors Mathematics

22 Class Meetings

Revised May 2026

Essential Questions

- How can you apply the properties of operations to generate equivalent expressions?
- In what ways can you reason and solve one-variable equations and inequalities?

Enduring Understandings with Unit Goals

EU 1: Numerical expressions can be evaluated using the order of operations while algebraic expressions can be used to represent real-world situations where variables represent unknown quantities or quantities that vary.

- Evaluate expressions involving exponents
- Write and evaluate algebraic expressions

EU 2: A solution to an equation or inequality represents the value(s) for the variable that, when substituted in, make the equation or inequality a true statement.

- Solve one-step equations using all operations
- Write, graph, and solve inequalities

EU 3: An equation can be used to model the association between two quantities where one quantity is considered the independent variable and the other quantity is the dependent variable.

- Write and graph ratio situations
- Use tables, graphs, and equations to represent the relationship between quantities

Standards

Common Core State Standards:

- **6.EE.A.1:** Write and evaluate numerical expressions involving whole-number exponents.
- **6.EE.A.2:** Write, read, and evaluate expressions in which letters stand for numbers.
- **6.EE.A.2.A:** Write expressions that record operations with numbers and with letters standing for numbers.
- **6.EE.A.2.B:** Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.
- **6.EE.A.2.C:** Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).
- **6.EE.A.3:** Apply the properties of operations to generate equivalent expressions.
- **6.EE.A.4:** Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).
- **6.EE.B.5:** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to

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determine whether a given number in a specified set makes an equation or inequality true.

- **6.EE.B.6:** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
- **6.EE.B.7:** Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers.
- **6.EE.B.8:** Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
- **6.EE.C.9:** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time

ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community.

Unit Content Overview

- **Numerical Expressions with Exponents**
 - What are exponents
 - Evaluate numerical expressions involving whole number exponents
 - Vocabulary-order of operations, exponents, numerical expression, product
- **Algebraic Expressions**
 - Use variables to write expressions
 - Evaluate expressions
 - Write expressions for verbal statements
 - Vocabulary-variable, term, sum, difference, product, quotient, equivalent
- **Equivalent Expressions**
 - Identify equivalent expressions
 - Distributive property
 - Write algebraic expressions
 - Vocabulary-commutative property, associative property, distributive property, algebraic

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expression, term, variable

- **Equations**
- Define and identify solutions
- Write equations for real-world situations
- Solve one step equations using addition and subtraction
- Solve one step equations using multiplication and division
- Vocabulary-equation, solution, substitution, sum, difference, product, quotient, isolate
- **Inequalities**
- Define and identify solutions
- Write and graph inequalities
- Solve one step inequalities
- Vocabulary- equation, solution, variable, term, substitution, sum, difference, product, quotient
- **Representing Relationships**
- Write equations for and graph ratio situations
- Identify independent and dependent variables
- Represent the relationship between two quantities using tables, graphs, and equations
- Vocabulary- equation, solution, variable, term, substitution, sum, difference, product, quotient, independent variable, dependent variable

Interdisciplinary Connection:

- Language Arts – Reading strategies for solving word problems; vocabulary, CER writing strategies
- Humanities:
 - Unit 1: Many Faces, Many Places
- Science –
 - Unit 1: Weather Patterns
 - Unit 2: Earth and Universe
 - Unit 3: Inside the Earth

Daily Learning Objectives with *TWPS*

Students will be able to...

- Write and evaluate numerical expressions involving whole number exponents
 - *TWPS- SBAC- A student describes a math situation using words: "start with 12. Subtract 5. Then multiply the result by 4." A) Write a numeric expression that represents this situation. B) Explain how the words in the description helped you decide which operations to use and the order in which to write them.*
- Apply the Order of Operations to evaluate given problems and expressions
 - *TWPS- In the expression 5cubed, 5 is the base and 3 is the exponent. Select the statement that provides an equivalent expression for 5 cubed with the correct justification. A) $5 \times 5 \times 5$ because the base tells you the number of times the exponent is used as a factor. B) $5 \times 5 \times 5$*

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because the exponent tells you the number of times the base is used as a factor. C) $3 \times 3 \times 3 \times 3 \times 3$ because the base tells you the number of times the exponent is used as a factor. D) $3 \times 3 \times 3 \times 3 \times 3$ because the exponent tells you the number of times the base is used as a factor.

- Compose expressions that record operations with numbers and variables using mathematical terms.
 - TWPS- Matia claims, "When you square any number, the result is always greater than that number." Matia used the example $3 \text{ squared} = 9$ and 9 is greater than 3. Matia's claim is not correct. Select all the numbers that show Matia's claim is not correct. Explain your Mathematical Thinking. (0, 0.5, 1.5, 5)
- Evaluate algebraic expressions when given a value for the variable.
 - TWPS- SBAC- Colin's lunch account starts with \$100. He spends \$5 on lunch each day. Enter an expression that shows the amount of money in Colin's lunch account after x days. Explain your mathematical thinking.
- Build and evaluate identities for the relationships between addition & subtraction and multiplication & division.
 - TWPS- SBAC- Allison is saving to buy a \$500 bicycle by working during summer vacation. The job pays her \$8 for every 1 hour worked. Allison works exactly 20 hours each week. If she works for 4 weeks and buys the bicycle, how much money will she have left over? Explain your mathematical thinking.
- Create equivalent algebraic expressions using the distributive property to factor and expand expressions
 - TWPS- SBAC: Select all equations that have $n=6$ as a solution. A) $2 + n = 6$ B) $n + 6 = 12$ C) $4 \times n = 24$ D) $n \times 3 = 2$ Explain your mathematical thinking.
- Apply the Associative & Commutative Properties to addition and multiplication to evaluate equivalent expressions
 - TWPS- SBAC practice: Enter the value of $2^3 - 16 \div 2 + 5^2$ Explain your mathematical steps.
- Write equivalent expressions using algebra tiles to simplify expressions.
 - TWPS- Consider this expression: $2(3n + 6z)$ Enter an expression that shows the sum of exactly two terms that is equivalent to $2(3n + 6z)$. Explain your mathematical thinking.
- Calculate solutions to one step equations using addition and subtraction
 - TWPS- SBAC practice: Consider this expression: $7(10a + 3b)$. Enter an expression that shows the sum of exactly two terms that is equivalent to $7(10a + 3b)$. Explain your mathematical thinking.
- Calculate solutions to one step equations using multiplication and division
 - TWPS- Jack pays \$3.50 for lunch each day. He buys lunch for x days. Enter an equation to show the total amount of money, y , in dollars, Jack would spend in x days. Explain your mathematical thinking.
- Solve one step equations using all 4 operations
 - TWPS- Paul could play 16 songs on his guitar. He learns some new songs. Now he can play 23 songs. On the first line, enter an equation to represent the number of new songs, s , that Paul learns. On the second box, enter the number of new songs represented by s in this situation. Explain your mathematical thinking.
- Generate solutions to inequalities

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- *TWPS- Which One Doesn't Belong? (7%, 0.7, seven-tenths, or 7/10) Explain your mathematical reasoning.*
- Model the solutions to one step inequalities on a number line
 - *TWPS- Which one doesn't belong? ($3x=27$, $x-5=9$, $-7+x=2$, or $x/3=3$) Explain your mathematical thinking.*
- Analyze the relationship between the dependent and independent variables using equations, graphs, and tables
 - *TWPS-The total cost to enter an amusement park can be given by the expression $14c + 18a$ where c is the number of children entering the park and a is the number of adults entering the park. Which expression also represents the total cost for c children and a adults to enter the amusement park? A) $1(4c + 8a)$ B) $2(7c + 9a)$ C) $7(2c + 18a)$ D) $9(14c + 2a)$. Explain your mathematical thinking.*

Instructional Strategies/Differentiated Instruction

- Whole group instruction
- Guided notes
- Student-led instruction/discussions
- Independent problem-solving
- Collaborative problem-solving
- Graphic Organizer
- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Homework
- Word walls with visuals
- Small group instruction
- Manipulatives
- Interactive Notebook
- Highlighted directions
- CER (Claim, Evidence, Reason)

EL DIFFERENTIATED INSTRUCTION:

- Word Walls with visuals
- TWPS (Think, Write, Pair, Share)
- Pre-reading strategies
- Culturally responsive teaching

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- Explicit Modeling
- Key Vocabulary
- Graphic Organizers
- Strategic Grouping
- Non-verbal Assessments
- Modified classwork and homework

Assessments

FORMATIVE ASSESSMENTS:

- Warm-ups
- TWPS
- CER
- Whiteboards
- Mid-class check-ins (Fist of 5; Thumbs up/mid/down)
- Exit Slips
- Accountable Talk Discussions
- Student-led instruction
- Classwork
- Homework

SUMMATIVE ASSESSMENTS:

- Quiz - EU 1 (Pear Assessment)
- Quiz - EU 2 (Pear Assessment)
- (Pear Assessment) Unit 4 Summative Assessment
- Performance Task- Acme Bus Company
- IAB- Expressions & Equations
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Unit Task

Unit Task Name: Acme Bus Company

Description:

In this task, students will utilize technology to complete an SBAC style performance task. Students will apply problem solving skills to solve multi-step real-world problems involving variables and rational numbers (EU1, EU2). Students will create and use expressions and equations to determine the best price given specific parameters (EU3). Students will determine the most economical transportation plan and then create their own plan based on their interpretation of the data.

Evaluation: Unit 3 Summative Performance Task Assessment Rubric

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Unit Resources

- Engageny
- Math In Focus
- Math Antics
- Pear Assessment
- Match Fishtank
- Khan Academy
- SBAC Prep Online
- Two Truths and One Lie
- Education.com
- Commoncoresheets.com
- Maneuvering the Middle
- Interactive notebooks
- Individual white boards