# Unit 3 - Expressions and Equations

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

## Unit Overview

Apply and extend previous understandings of arithmetic to algebraic expressions. Reason about and solve one-variable equations and inequalities. Represent and analyze quantitative relationships between dependent and independent variables. Modules 5,6,&7.

## Enduring Understandings

Two expressions are equal when they have the same numerical value.
One-variable equations and inequalities can be solved using inverse operations.
Combining like-terms and factoring can be used to simplify expressions and to write equivalent expressions.

Variables are used to represent an unknown number in an expression or equation.

There is an order of operations for solving numerical expressions.

Exponents are repeated multiplication of the base.

The properties of operations can be applied to generate equivalent expressions

Parts of equations are: sum, difference, product, quotient, variable, coefficient, and constant.

## Essential Questions

What does it mean for two expressions to be equivalent?
What are some strategies used to determine if two numbers or expressions are equal?
How can we use algebraic expressions to analyze or solve problems?
What is the relationship between independent and dependent variables?

## Learning Objectives

Write and evaluate numerical expressions involving whole-number exponents.

Write expressions that record operations with numbers and with letters standing for numbers.

Identify parts of an expression using mathematical terms.

Evaluate expressions at specific values of their variables, including expressions that arise from formulas used in real-world problems.

Apply the properties of operations to generate equivalent expressions.

Identify when two expressions are equivalent.

Solving an equation or inequality is a process which uses substitution to determine whether a given number in a specified set makes the equation or inequality true.

Use variables to represent numbers and write expressions when solving a real-world or mathematical problem.

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.

Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in real-world or mathematical problems.

Use variables to represent two quantities in a real-world problem that change in relationship to one another.

## Standards: Content

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|---|---|
| 6.EE | Expressions and Equations |
| 6.EE.A | Apply and extend previous understandings of arithmetic to algebraic expressions |
| 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 | Reason about and solve one-variable equations and inequalities |
| 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 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 |

| | |
|---|---|
| | □ + □ = □ and □□ = □ for cases in which □, □ and □ are all nonnegative rational numbers. |
| 6.EE.B.8 | Write an inequality of the form □ > □ or □ < □ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form □ > □ or □ < □ have infinitely many solutions; represent solutions of such inequalities on number line diagrams. |
| 6.EE.C | Represent and analyze quantitative relationships between dependent and independent variables |
| 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. |

## Standards: Interdisciplinary

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| 9.1.8.FI.1 | Identify the factors to consider when selecting various financial service providers. |
| 8.2.8.ITH.1 | Explain how the development and use of technology influences economic, political, social, and cultural issues. |

## Assessment Evidence

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| Formative | Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Games, Exit Slips, Pre-Assessments, Math Message – Warm up, Questioning, Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips, Pre-Assessments |
| Summative | LinkIt Benchmark Assessments, Tests, Pre-Assessments, Quizzes, Written Responses |
| Alternative & Benchmark | Alternative – Reteaching, One on One Conferencing, Learning Centers, Levels Homework, Higher Order Thinking Problems, Additional leveled practice<br>Benchmark - LinkIt Benchmark Assessments, Totowa TPA |
| Assessment Evidence Resource | |

## Instructional Resources

Smartboard, Computers, iPads, websites and digital interactives/models, multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Assorted Manipulatives, Khan Academy, Crosswalk Coach for the Common Core Standards, Ready Common Core Mathematics Instruction and Practice, Common Core Coach, Calculators, Reveal Math Resources.

Instructional Resource List

## Curricular Mandates

*Below are the curricular requirements as defined in NJ Administrative Code and Statute*

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| | Amistad | | Diversity, Equity, and Inclusion |
| | Holocaust | | LGBT and Disabilities (Grades 6-12) |
| | Climate Change | | Asian American & Pacific Islander |

## Social Emotional Learning (SEL) Competencies

*NJ Social and Emotional Learning Competencies & Sub-Competencies*

| | | | |
|---|---|---|---|
| | Self-Awareness | X | Relationship Skills |
| X | Responsible Decision-Making | | Social Awareness |
| X | Self-Management | | |

## 21st Century Skills & Themes

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| | Global and Cultural Awareness | X | Technology Literacy | | Planning and Budgeting |
| X | Creativity and Innovation | | Financial Institutions | | Risk Management and Insurance |
| X | Information and Media Literacy | | Digital Citizenship | | Economic and Government Influences |
| | Critical Thinking and Problem Solving | | Credit Profile | | Career Awareness and Planning |
| | Civic Financial Responsibility | | Financial Psychology | | |