

Unit 2: Solving Equations

Algebra Prep

14 meetings

Revised May 2022

Essential Questions

- How can an understanding of the number properties help you solve equations that can represent real-world situations?
- How can you analyze, model, and solve mathematical situations using algebraic equations?

Enduring Understandings with Unit Goals

EU 1: Properties of real numbers, properties of equality, and inverse operations can be used to solve equations in one variable.

- Apply the distributive property to evaluate expressions.
- Evaluate and simplify expressions by combining like terms.
- Utilize inverse operations to solve one- and two-step equations.

EU 2: There is a precise order to solving multi-step equations.

- Apply the five steps to solving multi-step equations to isolate a variable.

Standards

Common Core State Standards:

- **8.EE.C.7:** Solve linear equations in one variable.
- **8.EE.C.7. A:** Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
- **8.EE.C.7. B:** Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

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.

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Unit Content Overview

1. Solving One- and Two-Step Equations

- Solve a one- and two-step equation
- Solve equations with two terms in the numerator
- Write equations to solve word problems
- Vocabulary: additive inverse property, additive identity property, addition equality property, coefficient, consecutive number, consecutive even number, consecutive odd number, constant, cross-multiplication, descending order, distributive property, division equality property, isolate the variable, leading coefficient, leading term, like terms, lowest common multiple (lcm), multiplicative identity property, multiplicative inverse property, multiplication equality property, one solution, place value, proportion, rational number, simplest form, substitution property, subtraction equality property, symmetric property, term, variable

2. Solving Multi-Step Equations (including variables on both sides)

- Determine if an equation has one solution, no solution or infinitely many solutions.
- Solve equations that require combining like terms
- Solve an equation using the distributive property
- Solve an equation that contains fractions
- Solve an equation that contains decimals
- Create equations to solve word problems
- Vocabulary: additive inverse property, additive identity property, addition equality property, coefficient, consecutive number, consecutive even number, consecutive odd number, constant, cross-multiplication, descending order, distributive property, division equality property, isolate the variable, leading coefficient, leading term, like terms, lowest common multiple (lcm), multiplicative identity property, multiplicative inverse property, multiplication equality property, one solution, place value, proportion, rational number, simplest form, substitution property, subtraction equality property, symmetric property, term, variable

Interdisciplinary Connection:

- Language Arts - Word Problems
- Science – Word Problems

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Daily Learning Objectives with *TWPS* Activities

Students will be able to...

- Solve and explain one - and two - step equations in one variable***
 - *Do Now–Parts of an Algebraic expression (revisited)*
 - *Do Now–Distribution Property*
 - *Do Now–Cross-multiplication*
- Translate real-world problems into one- and two-step equations
 - *Do Now–Error Analysis: Distributive Property*
- Apply inverse operations in the correct order to solve multi-step equations in one variable**
 - *Do Now–Replacement Set*
 - *Do Now–Word Problem*
- Solve and justify equations that have one solution, no solution, or infinitely many solutions. **
 - *Do Now- Error Analysis: Two Step Equations*

Instructional Strategies/Differentiated Instruction

- Whole-group instruction
- Creating authentic connections for students
- Rephrasing and restatement of information and concepts
- Guided notes
- Student-led instruction
- Small group instruction
- Independent problem-solving
- Collaborative problem-solving
- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Manipulatives
- Homework

EL DIFFERENTIATED INSTRUCTION:

- Word Walls with visuals
- TWPS (Think, Write, Pair, Share)
- Pre-reading strategies
- Culturally responsive teaching
- Explicit Modeling
- Key Vocabulary
- Graphic Organizers
- Strategic Grouping
- Non-verbal Assessments

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Assessments

FORMATIVE ASSESSMENTS:

- Warm-ups (SBAC)
- Accountable Talk Discussions
- Daily Think-Write-Pair Share (TWPS)
- Daily Do Now
- Warm-ups (SBAC prep)
- ABCD Cards
- Whiteboards
- Mid-class check-ins
- Exit Slips
- Student-led instruction
- Homework

SUMMATIVE ASSESSMENTS:

- Edulastic Quiz 1 – EU 1
- FIAB - Analyze and Solve Linear Equations EU 1, EU 2
- Performance Task – Cell Phone

Unit Task

Unit Task Name: Cell Phone

Description: Students will use information learned in this unit about how there are properties that can be used to simplify mathematical expressions (EU 1), how inverse operations can be used to solve linear equations (EU 2), and how there is a precise order to solving multi-step equations (EU 3) in order to complete a set of tasks specific to cell phone usage. Students will be investigating cell phones and their features. They will be asked to write and solve a series of problems as well as review and apply the algebraic terms and concepts learned in this unit.

Evaluation: Summative Assessment and Future Rubric in 2021-2022 school year

Unit Resources

- Flipped Google Classroom Videos
- Worksheets
- Calculator
- Laptops
- SBAC Prep Online

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- [Edulastic](#)
- [Kahn Academy](#)
- [Match Fishtank](#)
- [Map.Mathshell.org](#)
- [Online resources](#)