

Unit 1A: (Pre-Unit) - Equations and Inequalities

Content Area: **Mathematics**
Course(s): **Algebra 1**
Time Period: **4 weeks**
Length: **4 Weeks**
Status: **Published**

Unit Overview

This unit continues the study of solving equations and inequalities. Students will focus on writing equations in equivalent forms to solve problems; creating equations and inequalities that describe numbers or relationships; understanding solving equations and inequalities as a process of reasoning and explain reasoning; and solving equations and inequalities in one variable.

Transfer

Students will be able to independently use their learning to...

- Relate algebraic terminology to real life problems/applications.
- Apply knowledge of equations and inequalities to solve real life problems.
- Apply content to future mathematical classes after high school.

Meaning

Understandings

Students will understand that...

- Real-world phenomena can be represented efficiently in algebra by using symbols and operations. These symbols may represent unknown quantities which may or may not vary.
- Equations and inequalities can be transformed into equivalent forms so that solutions can be found.
- Critical vocabulary will be utilized throughout this course as well as in the field of mathematics
- The solutions to equations and inequalities can be interpreted according to the given situation

Essential Questions

Students will keep considering...

- How can mathematical ideas be represented in multiple ways and why can that be important?
- What is the most efficient use of mathematical processes to solve problems?
- How do equations/inequalities help us solve problems?
- How do equations/inequalities affect the way we think about solutions?
- How can critical vocabulary terms be used to better enhance the understanding of mathematics?

Application of Knowledge and Skill

Students will know...

Students will know...

- How to create equations and inequalities
- How to solve equations and inequalities
- How to solve literal equations
- How to solve absolute value equations and inequalities

Students will be skilled at...

Students will be skilled at...

- Writing equations and inequalities
- Solving equations and inequalities
- Manipulating literal equations
- Solving absolute value equations and inequalities

Academic Vocabulary

expression

equation

solution of an equation

inequality

variable

distributive property

coefficient

constant

absolute value

linear equation

literal equation

Learning Goal 1

- Create equations in one variable and use them to solve problems

MA.A-CED.A

Create equations that describe numbers or relationships

MA.A-CED.A.1

Create equations and inequalities in one variable and use them to solve problems.

Target 1 - Multi-Step Equations

- SWBAT solve equations in one variable that contain more than one operation (DOK: 2 - Comprehension)

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-12.6

Attend to precision.

MA.K-12.7

Look for and make use of structure.

MA.K-12.8

Look for and express regularity in repeated reasoning.

MA.A-CED.A.1

Create equations and inequalities in one variable and use them to solve problems.

MA.A-REI.A.1

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

MA.A-REI.B.3

Solve linear equations and inequalities in one variable, including equations with

coefficients represented by letters.

Target 2 - Literal Equations

- SWBAT solve literal equations (DOK: 4 - Knowledge Utilization)

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-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.
MA.A-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Target 3 - Absolute Value Equations

- SWBAT solve absolute value equations (DOK: 4 - Knowledge Utilization)

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-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.A-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Target 4 - Real World Applications

- SWBAT create and use single variable equations to model real world situations. (DOK: 4- Knowledge Utilization)

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.4	Model with mathematics.
MA.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems.

Learning Goal 2

- Create inequalities in one variable and use them to solve problems

MA.A-CED.A

Create equations that describe numbers or relationships

MA.A-CED.A.1

Create equations and inequalities in one variable and use them to solve problems.

Target 1 - Multi-Step Inequalities

- SWBAT solve and graph inequalities in one variable that contain more than one operation (DOK: 3 - Analysis)

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-12.6

Attend to precision.

MA.K-12.7

Look for and make use of structure.

MA.K-12.8

Look for and express regularity in repeated reasoning.

MA.A-CED.A.1

Create equations and inequalities in one variable and use them to solve problems.

MA.A-REI.B.3

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Target 2 - Absolute Value Inequalities

- SWBAT solve absolute value inequalities (DOK: 4 - Knowledge Utilization)

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

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MA.K-12.5

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MA.A-REI.B.3

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Target 3 - Real World Applications

- SWBAT create and use single variable inequalities to model real world situations. (DOK: 4 - Knowledge Utilization)

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Make sense of problems and persevere in solving them.

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MA.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems.

Formative Assessment and Performance Opportunities

- Academic games
- Classroom discussions
- Classwork
- Closures
- Do Nows
- Group work
- Homework
- Stations
- Student/Teacher Discussions
- Think-pair-share

Summative Assessment

- Performance Task
- Pre-Unit Exam
- Test/Quiz

21st Century Life and Careers and Technology

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP3	Attend to personal health and financial well-being.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CAEP.9.2.12.C.2	Modify Personalized Student Learning Plans to support declared career goals.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
TECH.8.1.12.E.CS4	Process data and report results.
TECH.8.2.12.A.CS3	The relationships among technologies and the connections between technology and other fields of study.
TECH.8.2.12.D.6	Synthesize data, analyze trends and draw conclusions regarding the effect of a technology on the individual, society, or the environment and publish conclusions.

Accommodations and Modifications

- 504 Accommodations
- Common Core Workbook Reference 1-5 (Solving Equations with Variables on Both Sides)
- Common Core Workbook Reference 1-6 (Solving for a Variable)
- Common Core Workbook Reference 1-7 (Solving Absolute Value Equations)
- Common Core Workbook Reference 2-1 (Graphing and Writing Inequalities)
- Common Core Workbook Reference 2-2 (Solving Inequalities by Adding or Subtracting)
- Common Core Workbook Reference 2-3 (Solving Inequalities by Multiplying or Dividing)
- Common Core Workbook Reference 2-5 (Solving Inequalities with Variables on Both Sides)
- Common Core Workbook Reference 2-6 (Solving Compound Inequalities)
- Common Core Workbook Reference 2-7 (Solving Absolute Value Inequalities)
- Grouping
- IEPs
- small group questions

Unit Resources

- Explorations in Core Math for Common Core: Algebra 1 (Holt McDougal)
- Illustrative Mathematics
- Khan Academy
- Kuta Software
- PARCC/NJSLA released questions

Interdisciplinary Connections

Real world applications involving budgeting for a business or family (MA.9-12.A-CED.A.1)

PFL.9.1.12.D.9

Relate savings and investment results to achievement of financial goals.