Unit 2: Equations & Angle Relationships

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

UNIT RATIONALE

The purpose of this unit is to provide students with the necessary skills to represent and analyze mathematical situations in order to solve real-world problems and predict unknown quantities in situations that can be represented with one variable. Learning how to apply the skills of writing and solving equations will help students to find missing measures in given geometric situations involving angles and sides of geometric figures.

ESSENTIAL QUESTIONS

-How can we use inductive reasoning to discover rules in mathematics?

-How can we use mathematical properties to reduce an expression to its simplest form?

-Why is it important to create a variety of equations to solve real-world problems?

-How can understanding angle relationships help us to find missing measures?

STANDARDS

NEW JERSEY STUDENT LEARNING STANDARDS: CONTENT AREA

New Jersey (NJSLS) - Grade 8 - Mathematics (2020)

MA.8.EE	Expressions and Equations
MA.8.EE.C.7	Solve linear equations in one variable.
MA.8.EE.C.7a	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 the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
MA.8.EE.C.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like

terms.

New Jersey (NJSLS) - K-12 - Math Practice Standards (2020)

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.

NEW JERSEY STUDENT LEARNING STANDARDS: CAREER READINESS, LIFE LITERACIES AND KEY SKILLS

TECH.9.4.8.TL.1	Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.
TECH.9.4.8.TL.3	Select appropriate tools to organize and present information digitally.
TECH.9.4.8.TL.5	Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.
TECH.9.4.8.TL.6	Collaborate to develop and publish work that provides perspectives on a real-world problem.

NEW JERSEY STUDENT LEARNING STANDARDS: COMPUTER SCIENCE AND DESIGN THINKING

CS.6-8.8.2.8.ED.2	Identify the steps in the design process that could be used to solve a problem.

PRE-ASSESSMENTS

One step equations review from 7th grade can be given as a pre-assessment.

One-Step_Equations_Worksheet.pdf

INSTRUCTIONAL PLAN

MODULE 1

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to solve one step equations that we can build skills that we will use to solve multi-step equations and also to solve real-world problems that can be modeled by equations.
Student Learning Strategies	-Peardeck Lesson on One Step Equations -IXL Lessons Y.1 through Y.7
Success Criteria	I can solve a one step equation by using inverse operations. I can check my solution to a one step equation by substitution. I can model an equation to represent a real-world problem.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

[Solving Equations Using Addition & Subtraction](#)

[Solving Equations Using Multiplication and Division](#)

MODULE 2

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to solve two step equations that we can model real-world problems using equations that can be solved by solving those equations.
Student Learning Strategies	-Peardeck Lesson on Solving Two Step Equations -IXL Lessons Y.8 through Y.10
Success Criteria	I can solve two step equations by applying inverse operations. I can check my solution to a two step equation by substitution.

	I can model real world problems by writing two st equations and solve those problems.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

[Solving Two-Step Equations](#)

MODULE 3

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to solve multi-step equations so that we can model real-world problems using equations that can be solved by those equations.
Student Learning Strategies	-Peardeck Lesson on Solving Multi-Step Equations -IXL Lessons Y.11, Y.14, & Y.15
Success Criteria	I can solve multi step equations by applying inverse operations, combining like terms, and applying the distributive property. I can check solutions to a multi step equation by substitution. I can model a real-world problem by writing a multi step equation and can solve that problem.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

MODULE 4

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to solve equations with variables on both sides so that we can model real world problems that can be solved by those equations.
Student Learning Strategies	-Peardeck Lesson on Solving Equations with Variables on Both Sides -IXL Lessons Y.12, Y.13, Y.16, & Y.17
Success Criteria	I can solve equations with variables on both sides I can check a solution to an equation with variable on both sides by substitution. I can model a real-world problem by writing an equation with variables on both sides and solving that problem.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

Solving Equations with Variables on Both Sides

MODULE 5

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to determine if an equation none, one, or infinitely many solutions so that we can recognize when real-world situations may ha no solution or many solutions.
Student Learning Strategies	-Peardeck Lesson on Special Solutions -IXL Lessons Y.19 & Y.20
Success Criteria	I can determine if an equation has one, none, or infinitely many solutions. I can create an equation with either one, none, or

	infinitely many solutions.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

[Variables on Both Sides: Special Solutions](#)

MODULE 6

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to write equations for word problems so that we can apply equation solving skills to find the solutions to real-world situations and problems.
Student Learning Strategies	-Peardeck Lesson on Problem Solving -Worksheet on Problem Solving
Success Criteria	I can write an equation in order to solve a word problem with unknown quantities. I can check my answer for a word problem to see if it is reasonable given the context in which the equation was written.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

MODULE 7

Student Learning Intentions (SLI) WALT: (We are learning to…)	We are learning how to write and solve equations so that we can find the missing values of angles in triangles, quadrilaterals, vertical angles and linear pairs.
Student Learning Strategies	-Peardeck Lesson on Angle Relationships -IXL Lessons Q.7 through Q.15
Success Criteria	I can write and solve an equation to find the missing angle measure of a triangle, quadrilateral, vertical or linear angle pair.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

REFLECTIONS

Students seemed to do very well with this unit. Good idea to review the one step and two step equations again as a refresher from 7th grade.

INTERDISCIPLINARY CONNECTIONS: NEW JERSEY STUDENT LEARNING STANDARDS FOR ELA, SOCIAL STUDIES, SCIENCE AND/OR MATHEMATICS

LA.K-12.NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
LA.K-12.NJSLSA.W2	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
LA.W.8.1	Write arguments to support claims with clear reasons and relevant evidence.
LA.W.8.2.D	Use precise language and domain-specific vocabulary to inform about or explain the topic.