02_Algebra

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **4 Weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

The middle school Guided Study Program is a two-pronged program. It parallels the grade-level math curriculum to reinforce and/or preview concepts taught in the grade-level math class and prepares students for success on state-mandated assessments by targeting individual student mathematical deficiencies. Guided Study marking period grades are based upon participation/preparation, classwork, and summative assessments and are reported as: O (Outstanding), S (Satisfactory), or U (Unsatisfactory).

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Objectives:

- Develop an understanding of basic algebraic concepts, including variables, expressions, and equations.
- Solve one-step and multi-step equations using appropriate methods and strategies.
- Explore the concept of functions and their representations, including tables, graphs, and rules.
- Apply algebraic skills to model and solve real-world problems.
- Strengthen critical thinking and problem-solving skills through algebraic reasoning.
- Build a foundation for more advanced algebraic concepts in later grades.

Essential Questions:

- How can variables and expressions be used to represent and solve mathematical situations?
- What methods can be used to solve equations, and how can we determine if a solution is valid?
- How do functions model relationships between variables, and how can they be represented graphically and algebraically?
- In what ways can algebraic techniques be applied to analyze and solve real-world problems involving rates, proportions, and patterns?
- How does algebraic reasoning contribute to a deeper understanding of mathematical relationships and patterns?
- What role does simplification and substitution play in solving equations and evaluating expressions?

Enduring Understandings:

- Algebra provides a powerful tool for representing and solving problems using variables and expressions.
- Equations are mathematical sentences that represent equality and can be solved to find the values of variables.
- Functions describe how two quantities relate to each other and can be visualized using graphs, tables, and algebraic rules.

- Algebraic skills can be applied to model and solve a variety of real-world problems, such as those involving proportions and rates of change.
- Algebraic reasoning involves identifying patterns, making connections, and drawing conclusions from mathematical representations.
- Simplification and substitution are fundamental strategies for solving equations and simplifying expressions, leading to a deeper understanding of mathematical relationships.

CONTENT AREA STANDARDS

MA.7.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
MA.7.EE.A.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
MA.7.EE.B.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
MA.7.EE.B.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

LA.K-12.NJSLSA.R7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
LA.RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
CS.K-12.2.d	Evaluate and select technological tools that can be used to collaborate on a project.
TECH.K-12.P.4	Demonstrate creativity and innovation.
TECH.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
TECH.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.

STUDENT LEARNING TARGETS

Refer to the 'Declarative Knowledge' and 'Procedural Knowledge sections.

Declarative Knowledge

Students will understand that:

- Algebra provides language through which we communicate patterns in math.
- A variable is a symbol that represents a quantity in a mathematical expression.
- A mathematical expression is a combination of symbols such as operations, numerals, and variables.
- A mathematical equation is a written statement indicating the equality of two expressions; it consists of a sequence of symbols that is split into left and right sides joined by an equal sign.

Procedural Knowledge

Students will be able to:

- Recognize and understand the use of variables.
- Translate word problems into algebraic representation.
- Evaluate algebraic expressions.
- Solve one- and two- step equations with rational numbers.

EVIDENCE OF LEARNING

Refer to the 'Formative Assessments' and 'Summative Assessments' sections.

Formative Assessments

- Do Now before each lesson
- Exit tickets at the end of each lesson and/or series of chunks of learning

Summative Assessments

This course allows students flexibility in the demonstration of their understanding at the conclusion of the unit:

- traditional/standardized assessments
- performance tasks
- projects

RESOURCES (Instructional, Supplemental, Intervention Materials)

- IXL
- Math Playground
- CMP3: Accentuate the Negative

INTERDISCIPLINARY CONNECTIONS

- Financial/Economic/Business/Entrepenerial Literacy

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.