Unit 01: The Language of Algebra (Chapter 1) Weeks 1-6

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

Standards Alignment

New Jersey Student Learning Standards

MA.A-SSE	Seeing Structure in Expressions
MA.A-SSE.A	Interpret the structure of expressions
MA.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context.
MA.A-SSE.A.1a	Interpret parts of an expression, such as terms, factors, and coefficients.
MA.A-SSE.A.1b	Interpret complicated expressions by viewing one or more of their parts as a single entity.
MA.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
MA.A-SSE.B	Write expressions in equivalent forms to solve problems
MA.A-SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

Integration of Career Readiness, Life Literacies and Key Skills

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
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.CRP5	Consider the environmental, social and economic impacts of decisions.
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.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP10	Plan education and career paths aligned to personal goals.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Technology / Integration of Computer Science and Design Thinking

TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.C	Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.12.C.1	Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.

Interdisciplinary Connections: NJSLS for ELA, Social Studies, Science and/or Math Section

Capacities of the Literate Individual
Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, & Language

They demonstrate independence.

They build strong content knowledge.

They respond to the varying demands of audience, task, purpose, and discipline.
They comprehend as well as critique.

They value evidence.

They use technology and digital media strategically and capably.

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning

Integration of Diversity, Equity and Inclusion; Climate Change; Informational and Media

LiteracyNew Section

see Crosswalks

21st Century Life and Careers

Stage I: Desired Results

Transfer/Overview/Rationale

Transfer / Overview / Rationale
Unit Rationale The purpose of this unit… **People rely on calculators and/or cell phones to make everyday calculations, there needs to be an understanding as to when the answer makes sense and when it does not. The rules of Order of Operation are crucial to calculating the correct answer when evaluating various math problems. The proper use of Math language is important when constructing an equations that represent a real world situation.**

Meaning

Essential Questions

Essential Questions

-Why are “the order of operations” and other properties of mathematics important?

-Why are the use of variables necessary in Algebra?

-Why is it advantageous to use and solve equations algebraically for real world problems?

-What are the "pieces" of an algebraic expression? What do they represent in the context of the real-world situation?

Enduring Understanding/Indicators of Understanding

Enduring Understanding/Indicators of Understanding

-The order in which we do things in everyday life matters, the order of operations that is used to evaluate an expression or to solve an equation is critical and can drastically change the solution.

-Symbolic Algebra, using variables (letters) is used to represent and explain mathematical relationships.

-The language of mathematics is communicated through specialized vocabulary and symbols used to represent and describe mathematical ideas generalizations and relationships.

Acquisition (Student Learning Objectives)

Knowledge

Knowledge

Students will know…

-How to perform arithmetic operations with real numbers and variables.

-As in life a double negative makes positive, this applies in math, when multiplying two negative numbers the

result is a positive number.

-Understand how properties are used with real numbers.

-How to evaluate an expression or solve an equation after changing the order of operations.

-The appropriate vocabulary to use when describing various mathematical operations.

Skills

Skills

Student will be skilled at …

-Recognizing applications of the commutative, associative, distributive properties.

-Finding sum, difference, product and quotient of two real numbers.

-Using the order of operations to evaluate expressions involving real numbers.

-Identifying algebraic expressions.

-Evaluating algebraic expressions given any real-number value for the variables.

-Using a calculator to evaluate algebraic expressions.

-Identifying terms and like terms.

-Combining like terms.

-Write verbal expressions for algebraic expressions

-Write algebraic expressions for verbal expressions

Stage 3: Learning Plan

Resource and Mentor Texts

Resources and Mentor Texts

Beginning Algebra 8th Edition

Kahoot.com

IXL.com

YayMath.com

Kutasoftware.com

Google Classroom

Desmos.com

Graphing Calculator

Formative Assessment Strategies

Formative Assessment Strategies

-Daily Warm up problems

-Exit Tickets

-Error Analysis

-IXL Quizzes

-Kahoot online review game

-Bellringer

-Homework/Classwork

Learning Activities/Unit of Study

Learning Activities/Unit of Study

-Lecture

-Stations - (Small group instruction, skills practice, online games, board work)

-Board/White Board Work - (solve problems/practice skills at board(360 degree instruction), or at seat with individual white boards)

-Technology Implementation - (Flipped learning videos to refresh skills, prodigygame.com,Kahoot to reinforce/assess skills, online games to practice skills, utilize internet to research, review and understand skills *See resources)

-Complete problem of the day - (POD - warm-up from bellringers packet)

-Review/Check Homework - (group check, partner check, whiteboard check)

-Work together to understand and practice the skill - partner work/larger group work to read lesson, and practice skills through "On Your Own" problems incorporated throughout each lesson

-Review and practice skills using a variety of materials - (text, workbook, chromebook, games, activities, discussion)

-Student led instruction

-Error Analysis

-Thumbs up/down/sideways - quick formative assessment to gauge students level of understanding

Exit Ticket - quick formative assessment to gauge students level of understanding

Modifications and/or Accommodations

Suggested Modifications (ELL, Sp. Ed, GIfted, At-risk of Failure)

English Language Learners

Native language support: The teacher provides auditory or written content to students in their native language.

Adjusted Speech: The teacher changes speech patterns to increase student comprehension. This could include facing the students, paraphrasing, clearly indicating the most important ideas, and speaking more slowly.

Visuals: The teacher uses graphics, pictures, visuals, and manipulatives. This helps ELL students better understand and comprehend the subjects at hand.

Front-Loading Vocabulary: The teacher front loads vocabulary. This means providing students with a list of important vocabulary words they will need to know for a book, lesson, etc. prior to the lesson being taught. Including pictures to go with the vocabulary words is also very beneficial for the students.

Special Education Students

Chunking: The teacher presents information in a way that makes it easy for students to understand and remember. Chunking is based on the presumption that our working memory is easily overloaded by excessive detail. The best way to deliver information is to organize it into meaningful units. Because students with special needs get overloaded easily, chunking is an effective strategy to use with them.

Checking for Understanding: It is important to constantly check for understanding, especially for students who have accommodations. Teachers want to make sure students understand the concepts being covered in a way that makes sense to them.

Extra time: The teacher provides students with special needs extra time to complete work or answer questions. It is important to give students enough time to process their thoughts.

Oral Reading: The teacher will read work orally to students. Class work such as tests and literature circles may need to be read aloud to the student.

Timers: The teacher will use timers as an instructional tool. The use of timers is beneficial for students who have trouble completing tasks. Timers can be helpful so the student is aware of how much time they have to complete an assignment.

Students with 504 Plans

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Gifted & Talented Strategies

Extensions/Enrichments: Teachers will provide gifted and talented students with extension/enrichment projects. Students will be challenged to further their understanding, to apply acquired knowledge, and/or to produce something in reference to acquired knowledge.

Modify/Change Activities: Teachers will monitor and modify activities to accommodate those students who need to be challenged further. Additional reading, problem-solving, writing, or project work is necessary for those students who are ready to move on at a rate more accelerated than their peers. In this way, G & T students are provided the same opportunity for support as special needs students.

Students at Risk of School Failure

Directions or Instructions: Make sure directions and/or instructions are given in limited numbers. Give directions/instructions verbally and in simple written format. Ask students to repeat the instructions or directions to ensure understanding occurs. Check back with the student to ensure he/she hasn't forgotten.

Peer Support: Peers can help build confidence in other students by assisting in peer learning. Many teachers use the 'ask 3 before me' approach. This is fine, however, a student at risk may have to have a specific student or two to ask. Set this up for the student so he/she knows who to ask for clarification before going to you.

Alternate or Modified Assignments: Always ask yourself, "How can I modify this assignment to ensure the students at risk are able to complete it?" Sometimes you'll simplify the task, reduce the length of the assignment or allow for a different mode of delivery. For instance, many students may hand something in, the at-risk student may jot notes and give you the information verbally. Or, it just may be that you will need to assign an alternate assignment.

Increase One to One Time: When other students are working, always touch base with your students at risk and find out if they're on track or needing some additional support. A few minutes here and there will go a long way to intervene as the need presents itself.

Contracts: It helps to have a working contract between you and your students at risk. This helps prioritize the tasks that need to be done and ensure completion happens. Each day write down what needs to be completed, as the tasks are done, provide a checkmark or happy face. The goal of using contracts is to eventually have the student come to you for completion sign-offs.

Hands On: As much as possible, think in concrete terms and provide hands-on tasks. This means a child doing math may require a calculator or counters. The child may need to tape record comprehension activities instead of writing them. A child may have to listen to a story being read instead of reading it him/herself.

Tests/Assessments: Tests can be done orally if need be. Break tests down in smaller increments by having a portion of the test in the morning, another portion after lunch and the final part the next day.

Seating: Seat students near a helping peer or with quick access to the teacher. Those with hearing

or sight issues need to be close to the instruction which often means near the front.