Sheltered Math Overview - Course 3163

Content Area: **Math**
Course(s): **Pre-Algebra**
Time Period:
Length: **Full Year**
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Cover Page

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Course Overview

COURSE DESCRIPTION:

The mission of the mathematics curriculum is for students to communicate, make connections, reason and represent the world quantitatively in order to pose and solve problems. This course is designed for English Language Learners with interrupted education coming to the East Brunswick District. The goal of the course is to provide the foundational skills to prepare the students to enter Algebra 1 the following year. Students will develop an understanding of Pre-Algebra foundational skills based on their individually identified educational needs.

Modifications

Newsela.com is available for differentiated reading assignments

The district has a license for Learning Ally. Learning Ally is an audio book resource for students who are unable to "eye read" grade level text but are able to comprehend when "ear reading" or listening.

Materials and Resources

Textbook: Glencoe Pre-Algebra by McGraw-Hill Education (2012).

- Teacher's Resource Package and online resources accompanying text (connectED.mcgraw-hill.com)

- TI-34 Multi-view or TI-30XIIS Scientific Calculator

Content Specific Standards

Sheltered Math Focus:

Instructional time should focus on four critical areas:

- Developing understanding of and applying vocabulary
- Developing understanding of operations with rational numbers and working with expressions and linear equations
- Solving problems involving scale drawings and informal geometric constructions; working with two-dimensional shapes to solve problems involving perimeter and area
- Drawing inferences about populations based on samples

Sheltered Math Overview

The Number System

• Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.

Expressions and Equations

• Use properties of operations to generate equivalent expressions.

• Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Geometry

• Draw, construct and describe geometrical figures and describe the relationship between them.

• Solve real-world and mathematical problems involving perimeter and area

Statistics and Probability

• Use random sampling to draw inferences about a population.

• Draw informal comparative inferences about two populations.

• Investigate chance processes and develop, use and evaluate probability models.

Standards for Mathematical Practice:

MP1. Make sense of problems and persevere in solving them.

MP2. Reason abstractly and quantitatively.

MP3. Construct viable arguments and critique the reasoning of others.

MP4. Model with mathematics.

MP5. Use appropriate tools strategically.

MP6. Attend to precision.

MP7. Look for and make use of structure.

MP8. Look for and express regularity in repeated reasoning

MA.7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
MA.7.RP.A.2a	Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
MA.7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
MA.7.RP.A.2c	Represent proportional relationships by equations.
MA.7.RP.A.2d	Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.
MA.7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems.
MA.7.NS.A.1a	Describe situations in which opposite quantities combine to make 0.
MA.7.NS.A.1b	Understand $p + q$ as the number located a distance $|q|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
MA.7.NS.A.1c	Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-$

	q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
MA.7.NS.A.1d	Apply properties of operations as strategies to add and subtract rational numbers.
MA.7.NS.A.2a	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
MA.7.NS.A.2b	Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number.If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.
MA.6.NS.C	Apply and extend previous understandings of numbers to the system of rational numbers.
MA.7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.
MA.7.NS.A.2d	Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
MA.6.NS.C.6	Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
MA.7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.
MA.6.NS.C.6b	Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
MA.6.NS.C.6c	Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
MA.6.NS.C.7a	Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
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.6.NS.C.7b	Write, interpret, and explain statements of order for rational numbers in real-world contexts.
MA.6.NS.C.7c	Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.
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.4a	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.
MA.7.EE.B.4b	Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.

MA.7.G.A.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
MA.7.G.A.2	Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
MA.7.G.A.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
MA.7.G.B.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
MA.7.G.B.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
MA.7.G.B.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
MA.7.SP.A.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
MA.7.SP.A.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.
MA.7.SP.B.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.
MA.7.SP.B.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.
MA.7.SP.C.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
MA.7.SP.C.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
MA.7.SP.C.7a	Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
MA.7.SP.C.7b	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.
MA.7.SP.C.8a	Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
MA.7.SP.C.8b	Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.
MA.7.SP.C.8c	Design and use a simulation to generate frequencies for compound events.
MA.7.7	In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3)

	solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.
MA.7.7.1	Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships.
MA.7.7.2	Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems.
MA.7.7.3	Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.
MA.7.7.4	Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.

Interdisciplinary Standards

NJSLS-Career Readiness, Life Literacies, and Key Skills

2020 New Jersey Student Learning Standards – Career Readiness, Life Literacies, and Key Skills 9.4 Life and Key Skills by the End of Grade 12	
Creativity and Innovation	
Core Ideas	**Performance Expectations**
wth mindset, failure is an important part	• 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use skills and ideas (e.g., 1.1.12prof.CR3a).
Critical Thinking and Problem-solving	

Core Ideas	Performance Expectations
on with individuals with diverse s can aid in the problem-solving process, for global issues where diverse e needed.	• 9.4.12.CT.1: Identify problem-solving strategies used in the deve of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12. • 9.4.12.CT.2: Explain the potential benefits of collaborating to en critical thinking and problem solving (e.g., 1.3E.12profCR3.a). • 9.4.12.CT.3: Enlist input from a variety of stakeholders (e.g., co members, experts in the field) to design a service learning activit addresses a local or global issue (e.g., environmental justice). • 9.4.12.CT.4: Participate in online strategy and planning sessions course-based, school-based, or other project and determine the s that contribute to effective outcomes.

Global and Cultural Awareness	
Core Ideas	**Performance Expectations**
o the problems faced by a global society contribution of individuals with different ew and experiences.	• 9.4.12.GCA.1: Collaborate with individuals to analyze a variety potential solutions to climate change effects and determine why solutions (e.g., political. economic, cultural) may work better tha (e.g., SL.11-12.1., HS-ETS1-1, HS-ETS1-2, HS-ETS1-4, 6.3.12 7.1.IH.IPERS.6, 7.1.IL.IPERS.7, 8.2.12.ETW.3).

Technology Literacy	
Core Ideas	**Performance Expectations**
s differ in features, capacities, and wledge of different digital tools is electing the best tool for a given task.	• 9.4.12.TL.1: Assess digital tools based on features such as acces options, capacities, and utility for accomplishing a specified task W.11-12.6.). • 9.4.12.TL.2: Generate data using formula-based calculations in a spreadsheet and draw conclusions about the data.
ve digital tools can be used to access, share different viewpoints and to collect e the views of groups of people.	• 9.4.12.TL.3: Analyze the effectiveness of the process and qualit collaborative environments. • 9.4.12.TL.4: Collaborate in online learning communities or socia or virtual worlds to analyze and propose a resolution to a real-wo problem (e.g., 7.1.AL.IPERS.6).

Pacing Guide

	Time Frame
of the Foundations of Pre-Algebra	3 weeks
s of Pre-Algebra	6 weeks
umbers and Operations	4 weeks
Plane and Slope	3-4 weeks
s and Equations	8 weeks
d Graphing Inequalities	2 weeks
s and Perimeter/Area of Figures	4 weeks
nd Probability	3 weeks

Formative and Summative Assessments

	Common Unit Test and Quizzes	Minor Assessments & Classwork	Projects	Homework	Midterm Exam	Fi
Mathematics Department incorporates a variety of methods for assessment including:						
MENT NT A	Student assessments based on specific or general content knowledge.	Any cooperative work primarily completed in class, Entrance/ Exit cards, Performance assessments etc.	Some of the courses may utilize content specific projects.	Work assigned to be completed outside of classroom	Common Comprehensive Assessment given after semester 1.	Com Com Asse give conc the a year

Grading Procedures and Evaluation

GRADING GUIDELINES:

As per Math Department Policy, grades will be determined by a variety of assessment strategies, including Major Assessments, Minor Assessments, and Performance Assessments. In addition to tests and quizzes, students will be evaluated on a combination of performance assessment instruments, including homework completions, cooperative group participation, note-taking, open ended question responses, lab reports and/or supplemental projects.

GRADING PROCEDURES:

Grading procedures must be described in sufficient detail so that a pupil will understand, the minimal to advanced proficiency, expected of him/her as the outcome of each unit, for the marking period and for the course as a whole. Benchmark level assessments associated with the course also need to be identified. While assessments of proficiency levels must be valid and reliable they do not need be the same for all students. Individual modifications will be made depending on the needs of each English Language Learner. Other criteria to be considered in grading must be identified and the degree to which such criteria will be considered in a grade. Each pupil must receive a copy of the grading procedures, proficiencies and criteria for each unit and/or marking period.

COURSE EVALUATION:

In this course the goal is that students master pre-Algebra skills. Student achievement levels will assessed through unit formative and summative assessments. The department will analyze the achievement of students

on Unit Assessments and Final Course Grades on an individual basis.

<table>
<tr><td colspan="1">Course evaluation requires the answering of the following questions:</td></tr>
<tr><td>

1. Are course content, instruction and assessments aligned with the required NJSLS?
2. Is instruction sufficient for students to achieve the Standards?
3. Do all students achieve the set proficiencies/benchmarks set for the course?

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Other Information

Mathematics (AAAN)

Sheltered Math

Course No. 3163

SCED

52051 Sheltered Math

The Sheltered Math course addresses four main areas:

- Developing understanding of and applying proportional relationships
- Developing understanding of operations with rational numbers and working with expressions and linear equations
- Solving problems involving scale drawings and informal geometric constructions; working with two- and three-dimensional shapes to solve problems involving area, surface area and volume
- Drawing inferences about populations based on samples