

South Brunswick School District



Middle School Mathematics Parent Guide

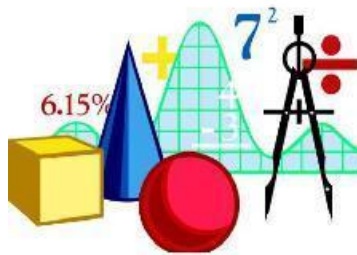
Curriculum Aligned to NJ CCSS: August 2012

Revised July 2015

District Mission

The South Brunswick School District will prepare students to be lifelong learners, critical thinkers, effective communicators and wise decision makers. This will be accomplished through the use of the New Jersey Core Curriculum Content Standards (NJCCCS) and/or the Common Core State Standards (CCSS) at all grade levels. The schools will maintain an environment that promotes intellectual challenge, creativity, social and emotional growth and the healthy physical development of each student.

~Adopted 8.22.11



Annual Board Approval of Mathematics Curriculum

August 2016

This curriculum is approved for all regular education programs as specified and for adoption or adaptation by all programs including those for Special Education, English Language Learners, At-Risk Students and Gifted and Talented Students in accordance with Board of Education Policy.

Note to Parents

The curriculum guide you are about to enter is just that, a guide. Teachers use this document to steer their instruction and to ensure continuity between classes and across levels. It provides guidance to the teachers on what students need to know and able to do with regard to the learning of a particular content area.

The curriculum is intentionally written with some “spaces” in it so that teachers can add their own ideas and activities so that the world language classroom is personalized to the students.

How to Read the Curriculum Document

Curriculum	Area of content (e.g. Science)
Topic	Course or Unit of Study (e.g. Biology)
Grade Level	Grade Level Cluster (e.g. High School) or specific grade level (e.g. Kindergarten)
Summary	A brief overview of the course or unit of study.
Rationale	A statement as to why we are teaching this course or unit.
Interdisciplinary Connections	Which other areas of content to which there is major linkage. For example, a health education unit might link to science, language arts, social studies, art, physical education, etc.
21st Century Connections	How this course or unit is preparing students to be college and career ready. Referred to as S.A.L.T., each course or unit indicates which of the following it is building: <ul style="list-style-type: none">• Skills such as critical or creative thinking, collaboration, communication, or core values• Awareness such as global, cross-cultural or career.• Literacy such as information, media, technology, etc.• Traits necessary for success in life and careers such as productivity.
Terminology	Key vocabulary and terms
Standards	Here you will find the standards that this course or unit of study is addressing. Our curriculum is standards-based. The standards are the foundation of the unit. You can get more information on state standards by going to the NJ Department of Education at www.state.nj.us/education/cccs
Enduring Understandings	The big ideas, concepts or life lessons that students walk away with at the end of a unit of study.
Essential Questions	Open ended questions that are considered throughout the unit of study. These are big, “worthy of wonder” questions often with multiple responses.
Objectives	The discrete skills and knowledge that students will gain during the unit of study.
Assessments	Assessments (tests, quizzes, projects, activities) that tell us if the students grasped the enduring understandings of the unit.
Lesson Plans & Pacing	Scope and sequence of lessons: how many, how long & approximately in what order.
Resources	Major resources associated with the course or unit.

Mathematics Acknowledgments

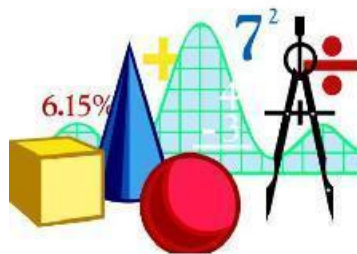
We are appreciative of the leadership provided by our curriculum specialists and the knowledge, skills, work and effort of the teachers who served on our curriculum writing teams. In many cases, our units are “home-grown.” While aligning with state and national standards, they are designed with the needs of the South Brunswick student population in mind.

Articulation

The Supervisors, Specialists, Curriculum Chairpersons, Technology Staff Developers, Directors and the Assistant Superintendent for Curriculum and Instruction meet for articulation at roundtables and ongoing administrative and content meetings throughout the year.

Among the topics of discussion are the following: curriculum review cycle, curriculum mapping, resources (ordering, budgeting, inventory), lesson plans, observation look-fors, professional development, NJ Quality Single Accountability Continuum and academic achievement, placement, acceleration, enrichment, basic skills, instructional support, technology proficiencies and content-specific technologies, formative and summative assessments, and various curriculum tasks.

Mathematics Curriculum Development Teams comprised of teachers at every grade level along with representative special education meet together throughout the year as needed. In a time period of major revision, the teams will meet with greater frequency.



Go down deep enough into anything and you will find mathematics.

~Dean Schlicter

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Note:

- The elementary math curriculum can be found in the K-2 and 3-5 Mathematics Curriculum Guides.
- The 9-12 mathematics curriculum can be found in the SBHS Mathematics Curriculum Guides: Core Math and Elective Math.

PREAMBLE TO THE MATHEMATICS CURRICULUM

Mission Statement

The South Brunswick Mathematics Program will be based on a well-articulated curriculum that is aligned with standards, has interwoven technology, is connected in meaningful ways to other curriculum and real life, that provides for differentiated needs of students, that is taught by teachers who are well-grounded in and comfortable with both content and methodology, and that leads to equity and excellence in math achievement for all children.

South Brunswick's Beliefs

1. Develop concepts concretely, pictorially, and then abstractly. Students use manipulatives to model abstract ideas, to represent the models as pictures, and finally to translate the model and/or picture into symbolic notation. Sometimes the transition from concrete to abstract takes years, as in the case of multi-digit addition computation; other times the transition may take a few class sessions, as in the case of multiplying fractions.

2. Require students to justify their answers. During class discussions and in written work students should always be asked *why*. Students should be able to verbalize, model, and to write the reason an answer has been given.

3. Provide time for students to write and talk mathematics. Students keep a math journal and discuss mathematical ideas as part of cooperative groups and as part of the whole class. Writing and talking mathematics allows students to clarify and explain thinking, justify answers, explain strategies, ask questions, listen to others, and react to ideas.

4. Develop problem situations from other content areas and from everyday experiences. Science, social studies, and language content are integrated into mathematics lessons. For example, when introducing 2-digit addition, the initial concrete model might be developed out of a social studies unit on Community Helpers. If the class has graphed the number of people going into different municipal buildings, finding the number of people going into 2 or 3 of the buildings together can begin the development of a 2-digit addition algorithm.

5. Give attention to connections among topics in math, between math and other content areas, and between math and daily life. Students should recognize, for example, that the array model of multiplication, the area of a rectangle, and paper folding to multiply fractions are all based on the same idea. Students should use strategies developed in math lessons in their work with other content and in their daily lives

6. Always encourage use of multiple strategies. For example, a large number of objects can be counted in several ways: by ones, by twos, by grouping into tens or by matching with a hundred-number board. Along with traditional algorithms, students should explore alternate methods of computation, including computational strategies developed by the students themselves.

7. Have students estimate quantities. Students then use that estimate to check reasonableness of answers. Estimate lengths, weights, and so on before measuring. Put out a handful of cubes and estimate the quantity.

8. Make mental math a part of any computation. Encourage students to calculate mentally. Help them to take the risk of giving an answer without using pencil and paper first. Mental math

strategies are treated as just another way, together with pencil and paper, calculators, concrete models, and pictorial models to calculate an answer.

9. Urge students to choose their tools and methods. Students are encouraged to choose among many different methods for problem solving (draw a picture, guess and check, write an equation, and so on), for calculating answers (mental math, paper and pencil, estimation, calculator), and for modeling (base ten blocks, money, geo-boards, counters, and so on).

10. Integrate computers and calculators into mathematics lessons. Students need to begin to choose technology as a tool. Graphing programs are one way to display data; spreadsheet programs are used to solve problems; calculators allow students to deal with more complicated numbers. Students should be offered the opportunity to use online virtual manipulatives, Internet resources and interactive whiteboards when available. Calculators allow students to deal with more complex problem solving.

11. Have students work in a variety of settings. The choice of settings - cooperative groups, pairs of students, individuals, and whole groups - depends on the teacher's objective and the specific content of the lesson. Students should be exposed to each kind of setting throughout the school year.

12. Design, develop, implement and evaluate digital-age learning experiences and assessments. For example, use of classroom technologies such as interactive whiteboards, projection devices, digital hardware and software.

Program Delivery

Our math classrooms are effective standards-based environments that foster understanding of big mathematical ideas, help students make connections between learning experiences, and enable students to see themselves as mathematicians. There are varied “math paths” that students follow during their course of study in South Brunswick.

Elementary School:

- Grade Level Math & Differentiation
- Accelerated Math K-5

Middle School:

- 6th Grade Unit Math
- 6th Grade Transitions (accelerated math)
- Pre-Algebra
- Concepts of Algebra
- Algebra I
- Geometry
- Algebra II (taken on the HS campus)

High School:

- Core Courses (3-Year Sequence): Algebra I¹, Geometry, Algebra II
- Illustrative Math Electives: Pre-Calculus, Calculus, Statistics, Discrete Math, Computer Science²

¹ Algebra I is a graduation requirement.

² Computer Science for the 21st Century also meets the mandate for 21st Century.

- Note: Many students begin the core sequence during their middle school years, which allows for them to take up to three Advanced Placement level courses. Although only three years of mathematics is required for graduation, the majority of South Brunswick students take four years of math. Recognizing the differing needs of our students, all of the courses offered have several levels, including Elements, Regular, Advanced, and Honors/AP

Resources

The following are resources used in our mathematics programs.

Elementary School

- Investigations in Data, Number, and Space
- Scott Foresman-Addison Wesley Mathematics
- On Core Mathematics (Houghton Mifflin Harcourt)
- Manipulatives: Hands-on and virtual
- Technologies: Scott Foresman and Calculators (Grades K-1: Calc-U-Vue; Grades 2-5: TI-108)
- SMART Boards (interactive whiteboards)
- Model classroom technologies: projectors, DVD players, speakers
- Study Island (Grades 3-5)
- Accelerated 5th Grade Math- MathScape, Connected Math

Middle School

- 6th Grade Unit Math- Big Ideas
- Accelerated 6th Grade Math- Big Ideas Advanced I
- 7th-8th McDougal Littell Pre-Algebra, Grade 7 Big Ideas Math, Grade 8 Big Ideas Math, Holt McDougal Algebra I, Jurgeson Geometry
- Manipulatives; Hands-on equations, communicators (mini-whiteboards), integer tiles, and 3-D prisms and cubes
- Technologies: SMARTBoards (interactive whiteboards); document camera; Texts Web sites & Homework Helplines; Calculators (TI 30SX II, TI-84); Study Island

High School

- Anchor Texts: Holt McDougal Texts, Houghton Mifflin Texts
- Technologies: Graphing Calculators (TI 84 and TI 89); Geometer Sketchpad
- SMART Board (interactive whiteboards)

Assessments

There are multiple and varied forms of assessment at each grade level. What follows is a list of the key assessment tools used at each level.

Assessments at the Elementary Level

- District-made Beginning of Year Math Assessment for Kindergarten
 - Mid-Year Check In for Kindergarten
 - District-made End of Year Competency Tests K-5
 - District-made End of Year Math Acceleration Tests K-5
 - District-made Pre and Posttests for grades 1-5
 - State Assessments (PARCC 3-5)
 - Mad Minute Drills/Otter Creek Drills
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- Teacher-Made Tests, Projects

Assessments at the Middle Level:

- Teacher-made Tests, Quizzes & Projects
- District-made Pre and Post Assessments
- Mid Terms and Final exams for Algebra and Geometry (advanced math)
- Crossroads (District Placement) Test
- Algebra Predictive Test for placement
- State Assessments (PARCC 6-8)

Assessments at the High School Level

- Teacher-made tests, quizzes and projects
- District-made Pre and Post Assessments
- Midterms and final exams (upper level courses)
- Final exams (core courses)
- State Assessments (PARCC 9-11)
- SAT, PSAT, ACT, Accuplacer, ASVAB
- AP exams

Curriculum Content Standards for Mathematics

The South Brunswick mathematics curriculum was developed to meet the objectives as stated in the NJ State Department of Education Core Curriculum Content Standards 2009 and/or the Common Core State Standards 2010. Technology Education, 21st Century Life and Career Education, and Character Education lessons are embedded where meaningful. Cross-curricular connections are purposely and explicitly noted.

The curriculum is written in the Understanding by Design format and is based on enduring understandings (broad concepts) with essential questions and both formative and summative assessments.

Complete copies of the standards for mathematics may be found at:

Common Core State Standards Initiative (CCSSI)<http://www.corestandards.org/>
<http://www.state.nj.us/education/cccs/>
<http://www.state.nj.us/education/cccs/>

MIDDLE SCHOOL CURRICULUM



CURRICULUM MAP: MIDDLE SCHOOL

Middle School Core Course Offerings						
<u>Standards</u>	6th Grade Math	Transitions Math	Pre Algebra	Concepts of Algebra	Algebra I	Geometry
<p>Mathematical Practices are encompassed in every course throughout middle school:</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>1. Make sense of problems and persevere in solving them.</p> <p>3. Construct viable arguments and critique the reasoning of others.</p> <p>5. Use appropriate tools strategically.</p> <p>7. Look for and make use of structure.</p> </div> <div style="width: 48%;"> <p>2. Reason abstractly and quantitatively.</p> <p>4. Model with mathematics.</p> <p>6. Attend to precision.</p> <p>8. Look for and express regularity in repeated reasoning.</p> </div> </div>						
Ratios and Proportional Relationships	6.RP.1 6.RP.2 6.RP.3	6.RP.1 7.RP.1 6.RP.2 7.RP.2 6.RP.3 7.RP.3	7.RP.1 7.RP.2 7.RP.3	7.RP.1 7.RP.2 7.RP.3	<p>See High School curriculum guides, as these are courses taught at the middle school level, but are considered high school courses.</p>	
The Number System	6.NS.1 6.NS.2 6.NS.3 6.NS.4 6.NS.5 6.NS.6 6.NS.7 6.NS.8	6.NS.1 7.NS.1 6.NS.2 7.NS.2 6.NS.3 7.NS.3 6.NS.4 6.NS.5 6.NS.6 6.NS.7 6.NS.8	7.NS.1 7.NS.2 7.NS.3	7.NS.1 8.NS.1 7.NS.2 8.NS.2 7.NS.3		
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Geometry	6.G.1 6.G.2 6.G.3 6.G.4	6.G.1 7.G.1 6.G.2 7.G.2 6.G.3 7.G.3 6.G.4	7.G.1 7.G.2 7.G.3 7.G.4 7.G.5 7.G.6	7.G.1 8.G.1 7.G.2 8.G.2 7.G.3 8.G.3 7.G.4 8.G.4 7.G.5 8.G.5 7.G.6 8.G.6 8.G.7		
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Functions				8.F.1 8.F.2 8.F.3	
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Middle School Math Courses



Sixth Grade Unit Math

Transitions Math

(Accelerated Math)

Pre Algebra

Concepts of Algebra

Algebra I

Geometry

Algebra II

CURRICULUM OVERVIEW: SIXTH GRADE UNIT MATH



Content Area: Mathematics

Course Title: 6th Grade Unit Math

Course Description: Unit Math covers 6th grade math standards.

Course Rationale:

This program is a 6th grade, on-level course offered through both a conceptual and skill-based approach. It also addresses the National Council of Teacher of Mathematics (NCTM) standards and is founded on the “Twelve Effective Instructional Practices” of the South Brunswick School District. Technology is embedded where meaningful and cross-curricular connections are purposely and explicitly noted.

Primary Interdisciplinary Connections:

Language Arts, Science, Social Studies, Physical Education, Art, Astronomy, Architecture and Technology.

21st Century Connections

S= Skills; A= Awareness; L= Literacy; T= Traits

- S Critical Thinking & Problem Solving, Creativity & Innovation, Communication & Collaboration, Core Ethical Values

- A Global, Cross Cultural, Career

- L Content, Financial, Civic, Health, Information, Technology, Media

- T Initiative, Productivity, Accountability, Self Direction, Humor, Resilience, Perseverance, Responding with wonderment and awe, Kindness, Respect, Service to Others, Responsible risk-taking, Manners, Responsibility, Empathy

Standards:

The curriculum is written in the Understanding by Design format and is based on enduring understandings, essential questions and both formative and summative assessments.

The math standards are broken into two categories: Content and Process.

Content Standards indicate **what** we want students to know:

EXPRESSIONS AND EQUATIONS

- 6.EE.1** write and evaluate numerical expressions involving whole-number operations, powers, exponents and order of operations
- 6.EE.2** write expressions and identify parts of an expression using mathematical terms

- 6.EE.3 apply properties of operations to general equivalent expressions
- 6.EE.4 identify when two expressions are equivalent
- 6.EE.5 understand solving an equation or inequality and use substitution

THE NUMBER SYSTEM

- 6.NS.1 interpret and compute products and quotients of fractions and mixed numbers and solve word problems
- 6.NS.2 fluently divide multi-digit numbers using the standard algorithm
- 6.NS.3 fluently add, subtract, multiply and divide multi-digit decimals using standard algorithm
- 6.NS.4 greatest common factor, least common multiple and distribute property, prime factorization, adding and subtracting fractions and factoring expressions
- 6.NS.5 understand positive and negative numbers as having opposite directions or values, and the meaning of 0 using integers, decimals and fractions
- 6.NS.6 rational numbers as a point on a number line and in a plane line with negative coordinates
 - a) recognize opposite signs of numbers as locations and relation to 0 using integers, fractions and decimals
 - b) ordered pairs in quadrants and reflections in the coordinate plane
 - c) find and position integers and rational numbers on a vertical and horizontal number line and pairs of integers on the coordinate plane
- 6.NS.7 understand ordering and absolute value of rational numbers
 - a) interpret statements of inequality
 - b) write, interpret and explain statements of order
 - c) absolute value of rational numbers; interpret absolute value
 - d) comparisons of absolute value
- 6.NS.8 solve real world and mathematical problems by graphing point in all four quadrants and find distance between points

RATIOS & PROPORTIONAL RELATIONSHIPS

- 6.RP.1 ratio and ratio language
- 6.RP.2 rate, unit rate and ratios
- 6.RP.3 ratio and rate reasoning
 - a) tables or equivalent ratios, find missing values and plot values, tables to compare ratios
 - b) unit rate involving unit pricing and constant speed
 - c) percent of a quantity, solve finding the whole, part and percent
 - d) ratio reasoning to convert measurements units

GEOMETRY

- 6.G.1 area of triangles, special quadrilaterals and polygons by composing and decomposing into other shapes
- 6.G.2 volume of right rectangular prism with fractional edge lengths and packing with unit cubes
- 6.G.3 draw polygons in coordinate plane, use coordinates to find length
- 6.G.4 #-D figures using nets of rectangles and triangles, use nets to find surface area

STATISTICS & PROBABILITY

- 6.SP.1 statistical questions
- 6.SP.2 distribution of data: center, spread and overall shape
- 6.SP.3 measures of center vs. measures of variation
- 6.SP.4 dot plots, histograms and box and whisker plots
- 6.SP.5 summarize numerical data sets
 - a) report number of observations and describe measurement and units of measurement

- b) describe patterns using measures of center and variability: mean, median, interquartile range and mean absolute deviation
- c) relate measures of center and variability to shape of data

TECHNOLOGY

8.1.4.A.5 Determine the benefits of a wide range of digital tools by using them to solve problems.

8.1.8.A.5 Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.

21st CENTURY THEMES

9.1.4.A Critical thinking and problem solving

9.1.8.B Creativity and innovation

9.1.8.C Collaboration, teamwork and leadership

9.1.8.D Cross-cultural understanding and interpersonal communication

9.1.8.E Communication and Media Fluency

9.1.8.F Accountability, Productivity and Ethics

9.3.4.A Career awareness

Process Standards indicate **how** we want students to learn:

Mathematical Practice:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

A complete copy of the standards for 7th GRADE may also be found at:

[Common Core State Standards Initiative \(CCSI\)](#)

Overview of Topics for Grade Six

Ratios and Proportional Relationships

Understand ratio concepts and use ratio reasoning to solve problems.

The Number System

Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

Multiply and divide multi-digit numbers and find common factors and multiples.

Apply and extend previous understandings of numbers to the system of rational numbers.

Expressions and Equations

Apply and extend previous understandings of arithmetic to algebraic expressions.

Reason about and solve one-variable equations and inequalities.

Represent and analyze quantitative relationships between dependent and independent variables.

Geometry

Solve real-world and mathematical problems involving area, surface area, and volume.

Statistics and Probability

Develop understanding of statistical variability.

Summarize and describe distributions.

Enduring Understandings:

Through problem solving, students experience the usefulness of mathematics in the real world.

- Number System
 - Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
 - Compute fluently with multi-digit numbers and find common factors and multiples.
 - Apply and extend previous understanding of numbers to the system of rational numbers.
- Expressions and Equations
 - Apply and extend previous understandings of arithmetic to algebraic expressions.
 - Reason about and solve one-variable equations and inequalities.
 - Represent and analyze quantitative relationships between dependent and independent variables.
- Ratios and Proportions
 - Understand ratio concepts and use ratio reasoning to solve problems.
- Statistics and Probability
 - Develop understanding of statistical variability.
 - Summarize and describe distributions.
- Geometry
 - Solve real-world and mathematical problems involving area, surface area and volume.

Essential Questions:

- Number System
 - How do you know which operation to choose when solving a real-life problem?
 - How can you use repeated factors in re-life problems?
 - What is the effect of inserting parentheses into a numerical expression?
 - Without dividing, how can you tell when a number is divisible by another number?
 - How can you find the greatest common factor of two numbers?
 - How can you find the least common multiple of two numbers?
 - What does it mean to multiply fractions?
 - How can you divide by a fraction?
 - How can you model division by a mixed number?
 - How can you add and subtract decimals?
 - How can you multiply decimals?
 - How can you use base-ten blocks to model decimal division?
 - How do you do mental math to multiply two numbers?
 - How can you represent numbers that are less than zero?
 - How can you use a number line to order real-life events?
 - How can you use a number line to compare positive fractions and decimals?
 - How can you describe how far an object is from zero?
 - How can you graph and locate points that contain negative numbers in a coordinate plane?
- Expressions and Equations
 - How can you write and evaluate an expression that represents a real-life problem?
 - How can you write an expression that represents an unknown quantity?
 - Does the order in which you perform an operation matter?

- How does rewriting a word problem help you solve a word problem?
- How can you use addition, subtraction, multiplication or division to solve an equation?
- How can you write an equation in two variables?
- How can you use a number line to represent solutions of an inequality?
- How can you use addition, subtraction, multiplication and division to solve an inequality?
- Ratios and Proportions
 - How can you represent a relationship between two quantities?
 - How can you find two ratios that describe the same relationship?
 - How can you use rates to describe changes in real-life problems?
 - How can you compare two ratios?
 - What is the connection between ratios, fractions and percents?
 - How can you use mental math to find the percent of a number?
- Statistics and Probability
 - How can you tell whether a question is a statistical question?
 - How can you find an average value of a data set?
 - In what other ways can you describe an average of a data set?
 - How can you describe the spread of a data set?
 - How can you use the distances between each data value and the mean of a data set to measure the spread of a data set?
 - How can you use place values to represent data graphically?
 - How can you use intervals, tables and graphs to analyze data?
 - How can you describe the shape of the distribution of a data set?
 - How can you use the quartiles to represent data graphically?
- Geometry
 - How can you derive the formula for area of a triangle, trapezoid and parallelogram?
 - How can you find the lengths of line segments in a coordinate plane?
 - How can you draw 3-D figures?
 - How can you find the area of the entire surface of a prism?
 - How can you use a net to find the surface area of a pyramid?
 - How can you find the volume of a rectangular prism with fractional edge lengths?

Unit Objectives

- Number System
 - Students will be divide two fractions and understand relationship between multiplication and division.
 - Students will be able to divide multi-digit numbers using standard algorithm
 - Students will use knowledge of whole number operations to perform the same operations with decimals.
 - Students will determine factors and multiples of numbers to determine greatest common factor and least common multiple and solve real-world problems.
 - Students will represent positive and negative numbers on a number line and use to describe situations in the real world.
 - Students will learn numbers with opposites, location on a number line and relationship to zero.

- Students will learn to graph positive and negative numbers in the coordinate plane and identify quadrants.
- Students will use the number line to order sets of positive and negative numbers and graph ordered pairs in all quadrants and solve real-world problems.
- Students will learn statements of inequalities.
- Students will use knowledge of rational numbers to describe real-world situations.
- Students will apply absolute value to real situations.
- Expressions and Equations
 - Students will exponents to show repeated multiplication
 - Students will write algebraic expressions, describe expressions and their parts, and identify variables.
 - Students will learn order of operations.
 - Students will write and identify equivalent expressions in real-world mathematical problems.
 - Students will learn to use substitution whether a number is a solution of an equation or inequality.
 - Students will write expressions to represent real-world or mathematical problems.
 - Students will use your knowledge of operations to solve equations.
 - Students will understand that an inequality has many solutions and graph them on a number line.
 - Students will write equations and analyze relationships between two variables.
- Ratios and Proportions
 - Students will be able to write ratios for various situations
 - Students will be able to determine if ratios are equivalent as well how to determine and unknown in an equivalent ratio
 - Students will be able to write and calculate unit rates to solve word problems
 - Students will use proportions to solve problems
 - Students will use proportions to determine the relationship in a table and graph, determine the constant of proportionality, write equations and understand graphs or proportions
 - Students will use proportions to solve problems involving scale drawings and similar figures.
 - Students will be able to relate fractions, decimals, and percents to each other.
 - Students will solve three different types of percent problems.
 - Students will represent percent equations in an algebraic context.
 - Students will use their knowledge of percents to help them solve real world problems.
- Statistics and Probability
 - Students will identify statistical and non-statistical questions.
 - Students will display data in histograms, dot plots, box plots and calculate the mean, median, interquartile range and mean absolute deviation in a data set.
 - Students will count the number of values in a data set identify the type of data and its unit of measurement.
 - Students will compare mean and median and use to describe a value of a data set.
- Geometry
 - Students will find the areas of triangle, special quadrilaterals, and polygons to solve both real-world and mathematical problems.

- o Students will graph polygons in the coordinate plane and find the length of a side
- o Students will find the volume of right rectangular prisms with fractional edge lengths.
- o Students will use nets to find surface area of 3-D figures.

Terminology:

Absolute value, algebraic expression, base, box and whisker plot, coefficient, common multiples, composite figure, constant, conversion factor, coordinate plane, dependent variable, edge, equation, equation in two variables, equivalent expressions, equivalent rates, equivalent ratios, evaluate, exponent, face, factor pair, factor tree, factoring and expressions, first quartile. Five-number summary, frequency, frequency table, graph of an inequality, GCF, LCM, histogram, independent variable, inequality, integers, interquartile range, inverse operations, leaf, LCD, like terms, mean, MAD, measure of center and variation, median, mode, negative and positive numbers, net, numerical expression, opposites, order of operations, origin, outlier, percent, perfect square, polygon, polyhedron, power, prime factorization, prism, pyramid, quadrants, quartiles, range, rate, ratio, ratio tables, reciprocals, solid, solution, solution of an equation in two variables, solution of an inequality, solution set, statistical question, statistics, stem stem-and-leaf plot, surface area, terms, third quartile, unit analysis, unit rate, variable, vertex volume

Formative Assessments

Ongoing and throughout unit of study; assessments may include:

- Informal assessments
- Teacher-based assessments

Specific interim assessments; formats may vary:

- Pre-test Benchmark Assessment
- Post-test Benchmark Assessment

Course Resources:

- Technologies: COWS, Chromebooks, SMART Boards, Notebook software, CCSS website, PowerSchool
- Text: Larson & Boswell, Big Ideas Math – Green
Houghton Mifflin Harcourt, On Core Mathematics, Grade 6
- Other: Study Island, Teacher made/workbook resources

CURRICULUM OVERVIEW: TRANSITIONS

MATH



Content Area: Mathematics

Course Title: Transitions

Course Description: Accelerated 6th grade Mathematics

Course Rationale:

This program is an accelerated 6th grade course offered through both a conceptual and skill-based approach. It also addresses the Common Core Standards and math practices. Technology is embedded where meaningful and cross-curricular connections are purposely and explicitly noted.

Primary Interdisciplinary Connections:

Language Arts, Science, Social Studies, Physical Education, Art, Astronomy, Architecture and Technology.

21st Century Connections

S= Skills; A= Awareness; L= Literacy; T= Traits

- S Critical Thinking & Problem Solving, Creativity & Innovation, Communication & Collaboration, Core Ethical Values
- A Global, Cross Cultural, Career
- L Content, Financial, Civic, Health, Information, Technology, Media
- T Initiative, Productivity, Accountability, Self Direction, Humor, Resilience, Perseverance, Responding with wonderment and awe, Kindness, Respect, Service to Others, Responsible risk-taking, Manners, Responsibility, Empathy

Standards:

The curriculum is written in the Understanding by Design format and is based on enduring understandings and broad concepts, essential questions, and both formative and summative assessments.

The math standards are broken into two categories: Content and Process.

Content Standards indicate **what** we want students to know:

EXPRESSIONS AND EQUATIONS

- 6.EE.1** - write and evaluate numerical expressions involving whole-number operations, powers, exponents and order of operations
- 6.EE.2** - write expressions and identify parts of an expression using mathematical terms
- 6.EE.3** – apply properties of operations to general equivalent expressions
- 6.EE.4** – identify when two expressions are equivalent

- 6.EE.5** – understand solving an equation or inequality and use substitution
- 7.EE.1** - add, subtract, factor, and expand linear expressions with rational coefficients
- 7.EE.2** - expressions in different forms
- 7.EE.3** - multi-step positive and negative rational numbers in any form and apply properties of operations.
- 7.EE.4** – variables, constructing simple equations and inequalities

THE NUMBER SYSTEM

- 6.NS.4** –distributive property and factoring expressions
- 6.NS.5** – understand positive and negative numbers as having opposite directions or values, and the meaning of 0 using integers, decimals and fractions
- 6.NS.6** – rational numbers as a point on a number line and in a plane line with negative coordinates
 - a) Recognize opposite signs of numbers as locations and relation to 0 using integers, fractions and decimals
 - b) ordered pairs in quadrants and reflections in the coordinate plane
 - c) find and position integers and rational numbers on a vertical and horizontal number line and pairs of integers on the coordinate plane
- 6.NS.7** – understand ordering and absolute value of rational numbers
 - a) interpret statements of inequality
 - b) write, interpret and explain statements of order
 - c) absolute value of rational numbers; interpret absolute value
 - d) comparisons of absolute value
- 6.NS.8** – solve real word and mathematical problems by graphing point in all four quadrants and find distance between points
- 7.NS.1** - add and subtract rational numbers; represent on a horizontal or vertical number line diagram. a) opposite quantities combine to make 0
 - b) absolute value of integers and additive inverse property
 - c) subtraction of rational numbers and show on number line
 - d) properties of operations as strategies to add and subtract rational numbers
- 7.NS.2** - multiplication and division of fractions to multiply and divide rational numbers
 - a) multiplication of integers
 - b) division of integers
 - c) multiply and divide rational numbers
 - d) long division resulting in terminating and repeating decimals
- 7.NS.3** - real-world problems using four operations with rational numbers

RATIOS & PROPORTIONAL RELATIONSHIPS

- 6.RP.1**- ratio and ratio language
- 6.RP.2** - rate, unit rate and ratios
- 6.RP.3** – ratio and rate reasoning
 - a) tables or equivalent ratios, find missing values and plot values, tables to compare ratios
 - b) unit rate involving unit pricing and constant speed
 - c) percent of a quantity, solve finding the whole, part and percent
 - d) ratio reasoning to convert measurements units
- 7.RP.1**- unit rates and ratios measured in like or different units
- 7.RP.2** - proportional relationships between quantities.
 - a) proportional relationships
 - b) constant of proportionality (unit rate)
 - c) proportional relationships by equations.
- 7.RP.3** - proportional relationships to solve multistep ratio and percent problems

GEOMETRY

6.G.1 – Area of triangles, special quadrilaterals and polygons by composing and decomposing.

6.G.2 – Volume of right rectangular prism with fractional edge lengths.

6.G.3 – draw polygons in coordinate plane, use coordinates to find length

7.G.6 - area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms

STATISTICS & PROBABILITY

6.SP.1 – statistical questions

6.SP.2 – distribution of data: center, spread and overall shape

6.SP.3 – measures of center vs. measures of variation

6.SP.4. – dot plots, histograms and box and whisker plots

6.SP.5 – summarize numerical data sets

a) report number of observations

b) describe attributes: measurement and units of measurement

c) describe patterns using measures of center and variability: mean, median, interquartile range and mean absolute deviation

d) relate measures of center and variability to shape of data

TECHNOLOGY

8.1.4.A.5 Determine the benefits of a wide range of digital tools by using them to solve problems.

8.1.8.A.5 Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.

21st CENTURY THEMES

9.1.4.A Critical thinking and problem solving

9.1.8.B Creativity and innovation

9.1.8.C Collaboration, teamwork and leadership

9.1.8.D Cross-cultural understanding and interpersonal communication

9.1.8.E Communication and Media Fluency

9.1.8.F Accountability, Productivity and Ethics

9.3.4.A Career awareness

Process Standards indicate **how** we want students to learn:

Mathematical Practice:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

A complete copy of the standards for 6th/7th GRADE may also be found at:

[Common Core State Standards Initiative \(CCSSI\)](#)

Enduring Understandings:

- Number System

- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Compute fluently with multi-digit numbers and find common factors and multiples.
- Apply and extend previous understanding of numbers to the system of rational numbers.
- Previous understanding of number and the ordering of numbers to the full systems of rational number operations of numbers can be directly applied to rational numbers.
- Rational numbers can be used to solve real world problems.
- Expressions and Equations
 - Apply and extend previous understandings of arithmetic to algebraic expressions.
 - Reason about and solve one-variable equations and inequalities.
 - Represent and analyze quantitative relationships between dependent and independent variables.
 - Sometimes there is more than one step to solve an equation.
 - Inequalities are used when solving real life application problems.
 - Equations can be solved using different properties.
- Ratios and Proportions
 - Apply and understand ratios, rates, and unit rates when solving real life problems.
 - Understand ratio concepts and use ratio reasoning to solve problems.
 - Utilize proportional relationships to solve real world problems
 - Percents are used in real world problems
 - Percents can be applied to problems in different ways
- Statistics and Probability
 - Statistical measures of center and measures of variation are used to help solve real world problems.
 - Understand that data can be used to use statistical questions.
- Geometry
 - Solve real-world and mathematical problems involving area, surface area and volume.
 - Formulas can be determined and used to calculate the area of both regular and irregular shapes
 - 3D figures have unique characteristics and properties
 - Perimeter and area of 2D figures are useful when finding volume and surface area of 3D figures.

Essential Questions:

- Number System
 - How do operations affect rational numbers?
 - How can we use rational numbers to solve real world application problems?
 - How can you represent numbers that are less than zero?
 - How can you use a number line to order real-life events?
 - How can you use a number line to compare positive fractions and decimals?
 - How can you describe how far an object is from zero?
 - How can you graph and locate points that contain negative numbers in a coordinate plane?
- Expressions and Equations

- How can you write and evaluate an expression that represents a real-life problem?
- How can you write an expression that represents an unknown quantity?
- Does the order in which you perform an operation matter?
- How does rewriting a word problem help you solve a word problem?
- How can you use addition, subtraction, multiplication or division to solve an equation?
- How can you write an equation in two variables?
- How can you use a number line to represent solutions of an inequality?
- How can you use addition, subtraction, multiplication and division to solve an inequality?
- How are equations solved?
- What are different properties of equations and how can they help solve them?
- What happens when two sides of an equation are not equal?
- Ratios and Proportions
 - How can you represent a relationship between two quantities?
 - How can you find two ratios that describe the same relationship?
 - How can you use rates to describe changes in real-life problems?
 - How can you compare two ratios?
 - What is the connection between ratios, fractions and percents?
 - How can you use mental math to find the percent of a number?
 - How can you compare lengths between customary metric systems?
 - How can you order numbers that can be written as fractions, decimals, and percents?
 - How do you recognize and represent proportional relationships between quantities?
 - How do you apply proportions?
 - What is percent of increase and decrease?
 - How do you find discounts, selling prices, and interest?
 - How are percents used to help solve real world problems?
 - What are the different ways percent problems are represented?
- Statistics and Probability
 - How can you tell whether a question is a statistical question?
 - How can you find an average value of a data set?
 - In what other ways can you describe an average of a data set?
 - How can you describe the spread of a data set?
 - How can you use the distances between each data value and the mean of a data set to measure the spread of a data set?
- Geometry
 - How can you derive the formula for area of a triangle, trapezoid and parallelogram?
 - How can you find the lengths of line segments in a coordinate plane?
 - How can you draw 3-D figures?
 - How can you find the area of the entire surface of a prism?
 - How can you use a net to find the surface area of a pyramid?
 - How can you find the volume of a rectangular prism with fractional edge lengths?

Unit Objectives

- Number System
 - Students will be applying their prior knowledge of the number system to problems involving rational numbers.
 - Students will be able to add, subtract, multiply and divide rational numbers.

- Students will transform rational numbers into decimals.
- Students will solve real world problems using rational numbers.
- Expressions and Equations
 - Students will examine commutative and associative properties of different equations.
 - Students will combine like terms within an equation and learn to use the distributive property to solve equations.
 - Students will solve multi-step equations involving different techniques
 - Students will graph and solve inequalities involving addition, subtraction, multiplication, and division.
- Ratios and Proportions
 - Students will be able to write ratios for various situations.
 - Students will be able to determine if ratios are equivalent as well how to determine and unknown in an equivalent ratio.
 - Students will be able to calculate unit rates to solve word problems.
 - Students will use proportions to solve problems.
 - Students will use proportions to determine the relationship in a table and graph, determine the constant of proportionality, write equations and understand graphs or proportions.
 - Students will be able to relate fractions, decimals, and percents to each other.
 - Students will solve three different types of percent problems.
 - Students will represent percent equations in an algebraic context.
 - Students will apply percent of increase and percent of decrease when solving problems.
 - Students will use their knowledge of percents to help them solve real world problems.
- Statistics and Probability
 - Students will identify statistical and non-statistical questions.
 - Students will display data in histograms, dot plots, box plots and calculate the mean, median, interquartile range and mean absolute deviation in a data set.
 - Students will count the number of values in a data set identify the type of data and its unit of measurement.
 - Students will compare mean and median and use to describe a value of a data set.
- Geometry
 - Students will calculate the perimeter of different 2D geometrical figures.
 - Students will calculate the area of rectangles, parallelograms, triangles and trapezoids.
 - Students will use previous knowledge of area formulas to calculate the area of irregular and shaded figures.
 - Students will learn how to compute the volume of different 3D figures.
 - Students will compute surface area of different 3D figures.

Terminology:

simplify, conjecture, evaluate, solve, equivalent, numerical expression, variable expression, evaluate, powers, exponent, perfect square, base, order of operations, integers, absolute value, coordinate plane, quadrants, ordered pair, origin, like terms, variable, coefficients, constants, equations, inverse operations, solution, equations, linear, inequality, solution set, independent, dependent, prime number, composite number, prime factorization, equivalent fractions, complex fractions, reciprocals, simplest form, rational number, real numbers, multiplicative inverse, ratio, rate, unit rate, proportion, cross

product, proportional relationship, similar figures, congruent figures, scale drawings, scale models, percent, percent of change, markup, discount, interest, simple interest, compound interest, relation, domain, mean, median, mode, range, input, output, conversion factor, MAD, quartile, frequency table, box and whisker plots, stem-and-leaf plot, histogram, polygon, composite figure, prism, pyramid, net, edge, surface area, vertex volume

Assessments

Formative: Ongoing and throughout unit of study; assessments may include-
Informal assessments
Teacher-based assessments

Summative: Specific interim assessments; formats may vary-
Pre-test Benchmark Assessment
Post-test Benchmark Assessment

Course Resources:

Technologies: COWS, Chrome Books SMART Boards, Notebook software, CCSS website,
Power School
Text: Big Ideas Math – Advanced 1
Big Ideas Math – Red (Supplementary)
OnCore Mathematics Middle School 6 and 7 – Houghton Mifflin Harcourt
Other: Study Island, Teacher made/workbook resources

CURRICULUM OVERVIEW: PRE ALGEBRA



Content Area: Mathematics

Course Title: Pre-Algebra

Course Description or Content Overview: Pre-Algebra which covers 7th and 8th grade math standards.

Course Rationale:

This program is an 8th grade, on-level course, and 7th grade accelerated course, offered through both a conceptual and skill-based approach. It also addresses the National Council of Teacher of Mathematics (NCTM) standards and is founded on the “Twelve Effective Instructional Practices” of the South Brunswick School District. Technology is embedded where meaningful and cross-curricular connections are purposely and explicitly noted.

Primary Interdisciplinary Connections:

Language Arts, Science, Social Studies, Physical Education, Art, Astronomy, Architecture and Technology.

21st Century Connections

S= Skills; A= Awareness; L= Literacy; T= Traits

- S Critical Thinking & Problem Solving, Creativity & Innovation, Communication & Collaboration, Core Ethical Values

- A Global, Cross Cultural, Career

- L Content, Financial, Civic, Health, Information, Technology, Media

- T Initiative, Productivity, Accountability, Self Direction, Humor, Resilience, Perseverance, Responding with wonderment and awe, Kindness, Respect, Service to Others, Responsible risk-taking, Manners, Responsibility, Empathy

Standards:

The curriculum is written in the Understanding by Design format and is based on enduring understandings, essential questions and both formative and summative assessments.

The math standards are broken into two categories: Content and Process.

Content Standards on **what** we want students to know:

EXPRESSIONS AND EQUATIONS

- 7.EE.1** add, subtract, factor, and expand linear expressions with rational coefficients
- 7.EE.2** expressions in different forms
- 7.EE.3** multi-step positive and negative rational numbers in any form and apply properties of operations.
- 7.EE.4** variables, constructing simple equations and inequalities

- 8.EE.1** properties of integer exponents, generating equivalent numerical expressions
- 8.EE.2** square and cube root symbols represent solutions to equations, evaluate square roots of small perfect squares and cube roots of small perfect cubes.
- 8.EE.3** powers of 10, estimating very large or small quantities
- 8.EE.4** operations with numbers expressed in scientific notation. Use scientific notation and choose units of appropriate size measurement
- 8.EE.5** graph proportional relationships, interpret unit rate as slope, compare proportional relationships.
- 8.EE.6** using similar triangles to explain why slope is the same between any two points, derive equation of a line
- 8.EE.7** solve linear equations in one variable
 - a. give examples of linear equations with a different number of solutions, show which number of solutions is true in each case
 - b. solve linear equations with rational number coefficients, combining like terms, distributive property

THE NUMBER SYSTEM

- 7.NS.1** add and subtract rational numbers; represent on a horizontal or vertical number line diagram. a) opposite quantities combine to make 0
 - b) absolute value of integers and additive inverse property
 - c) subtraction of rational numbers and show on number line
 - d) properties of operations as strategies to add and subtract rational numbers
- 7.NS.2** multiplication and division of fractions to multiply and divide rational numbers
 - a) multiplication of integers
 - b) division of integers
 - c) multiply and divide rational numbers
 - d) long division resulting in terminating and repeating decimals
- 7.NS.3** real-world problems using four operations with rational numbers
- 8.NS.1** decimal expansion, difference between rational and irrational numbers
- 8.NS.2** rational numbers approximate irrational to compare size and find on number line.

RATIOS & PROPORTIONAL RELATIONSHIPS

- 7.RP.1** unit rates and ratios measured in like or different units
- 7.RP.2** proportional relationships between quantities.
 - a) proportional relationships
 - b) constant of proportionality (unit rate)
 - c) proportional relationships by equations.
- 7.RP.3** proportional relationships to solve multi-step ratio and percent problems

GEOMETRY

- 7.G.1** scale drawings of geometric figures.
- 7.G.2** geometric shapes with given conditions: triangle focus.
- 7.G.3** two-dimensional figures resulting from three-dimensional figures: rectangular prisms and right rectangular pyramids
- 7.G.4** formulas for the area and circumference of a circle
- 7.G.5 -** supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure
- 7.G.6** area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms
- 8.G.1** rotation, reflection and translation

- 8.G.2** congruence of two-dimensional figures with transformations, describing transformations
- 8.G.3** describe effect of transformation on a figure using coordinates
- 8.G.4** similarity of two-dimensional figures after transformation(s) done to the first, describe sequence that exhibits similarity between them
- 8.G.5** parallel lines cut by transversal, angle sum and exterior angles, angle-angle criterion for similar triangles.
- 8.G.6** **explain** Pythagorean Theorem and its converse
- 8.G.7** apply the Pythagorean Theorem to determine unknown sides
- 8.G.9** know the formulas for volumes of cones, cylinders and spheres and use them to solve problems

STATISTICS & PROBABILITY

- 7.SP.1** statistics, sample populations and random sampling
- 7.SP.2** random sampling and population, and informal comparative population inferences
- 7.SP.3** degree of visual overlap of two numerical data distributions and measure of variability
- 7.SP.4.** measures of center and measures of variability from random samples and probability model
- 7.SP.5** chance events and likelihood of events
- 7.SP.6** probability of a chance events and long-run relative frequency
- 7.SP.7** probability models
 - a) uniform probability model with equal probability
 - b) probability model (which may not be uniform)
- 7.SP.8** probabilities of compound events
 - a) probability of a compound event is the fraction of outcomes
 - b) represent sample spaces for compound events
 - c) simulations to generate frequencies for compound events
- 8.SP.1** construct and interpret scatter plots, describe patterns and analyze data
- 8.SP.4** look for patterns, compare categorical data and their displays, relative frequencies

FUNCTIONS

- 8.F.1** each input has exactly one output, graph of a function is a set of ordered pairs with an input and corresponding output.
- 8.F.2** compare properties of two functions represented in different ways
- 8.F.3** Interpret the equation of a line as defining a linear function whose graph is a straight line

TECHNOLOGY

- 8.1.4.A.5** Determine the benefits of a wide range of digital tools by using them to solve problems.
- 8.1.8.A.5** Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.

21st CENTURY THEMES

- 9.1.4.A** Critical thinking and problem solving
- 9.1.8.B** Creativity and innovation
- 9.1.8.C** Collaboration, teamwork and leadership
- 9.1.8.D** Cross-cultural understanding and interpersonal communication
- 9.1.8.E** Communication and Media Fluency
- 9.1.8.F** Accountability, Productivity and Ethics
- 9.3.4.A** Career awareness

Process Standards on **how** we want students to learn.

Mathematical Practice:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

A complete copy of the standards for 7th and 8th GRADE may also be found at:

[Common Core State Standards Initiative \(CCSSI\)](#)

Enduring Understandings:

- Number System
 - Previous understanding of operations of numbers can be directly applied to rational numbers
 - Rational numbers can be used to solve real world problems
- Expressions and Equations
 - Equations can be solved using different properties
 - Sometimes there is more than one step to solve in an equation
 - Inequalities are used when solving for real life application problems
- Ratios and Proportions
 - Utilize proportional relationships to solve real world problems
 - Percents are used in real world problems
 - Percents can be applied to problems in different ways
- Statistics and Probability
 - Events are classified into different types. This determines the route to solving the problem
 - Probability, measures of center, and measures of variation all are used to help solve real world application problems
- Geometry
 - Formulas can be determined and used to calculate the area of both regular and irregular shapes
 - 3D figures have unique characteristics and properties
 - Perimeter and area of 2D figures are useful when finding volume and surface area of 3D figures

Essential Questions:

- Number System
 - How do operations affect rational numbers?
 - How can we use rational numbers to solve real world application problems?
- Expressions and Equations
 - How are equations solved?
 - What are different properties of equations and how can they help solve them?
 - What happens when two sides of an equation are not equal?
- Ratios and Proportions
 - How do you recognize and represent proportional relationships between quantities?
 - How do you apply proportions?

- How are percents used to help solve real world problems?
- What are the different ways percent problems are represented?
- Statistics and Probability
 - How does probability relate to real world application problems?
 - How can measures of center and variation be used to compare two sets of data?
 - How are different events classified and what can I use to solve them?
- Geometry
 - Can we determine if three side lengths would create a triangle?
 - What is the difference between area and perimeter?
 - How are 3D figures different from 2D figures?
 - What is a cross section of a figure and how will that help compute properties of the figure?
 - How are surface area and volume found for a 3D figure?

Unit Objectives

- Number System
 - Students will be applying their prior knowledge of the number system to problems involving rational numbers.
 - Students will be able to add, subtract, multiply and divide rational numbers
 - Students will transform rational numbers into decimals
 - Students will solve real world problems using rational numbers
- Expressions and Equations
 - Students will examine commutative and associative properties of different equations
 - Students will combine like terms within an equation and learn to use the distributive property to solve equations
 - Students will solve multi-step equations involving different techniques
 - Students will graph and solve inequalities involving addition, subtraction, multiplication, and division
- Ratios and Proportions
 - Students will be able to write ratios for various situations
 - Students will be able to determine if ratios are equivalent as well how to determine and unknown in an equivalent ratio
 - Students will be able to calculate unit rates to solve word problems
 - Students will use proportions to solve problems
 - Students will use proportions to determine the relationship in a table and graph, determine the constant of proportionality, write equations and understand graphs or proportions
 - Students will use proportions to solve problems involving scale drawings and similar figures
 - Students will be able to relate fractions, decimals, and percents to each other
 - Students will solve three different types of percent problems
 - Students will represent percent equations in an algebraic context
 - Students will apply percent of increase and percent of decrease when solving problems
 - Students will use their knowledge of percents to help them solve real world problems
- Statistics and Probability
 - Students will be introduced to the concept of sampling
 - Students will be able to draw inferences about a population based off a sample
 - Students will be able to compare two populations and solve real world application problems with them

- Students will be able to measure the difference between the centers by expressing it as a multiple of a measure of variability
- Students will understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring
- Students will be able to use experimental and theoretical probability to determine the likelihood of an event occurring
- Students will use the fundamental counting principle to solve problems
- Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation
- Geometry
 - Students will calculate the perimeter of different 2D geometrical figures
 - Students will calculate the circumference and area of different circles
 - Students will be able to determine whether a triangle is possible or not
 - Students will discover special pairs of triangles and the relationships they yield
 - Students will calculate the area of rectangles, parallelograms, triangles and trapezoids
 - Students will use previous knowledge of area formulas to calculate the area of irregular and shaded figures
 - Students will be introduced to 3D solids and cross sections of 3D figures
 - Students will learn how to compute the volume of different 3D figures
 - Students will compute surface area of different 3D figures

Terminology:

Numerical expression, variable, variable expression, evaluate, powers, exponent, base, order of operations, integers, absolute value, coordinate plane, ordered pair, like terms, equations, inverse operations, equations, linear inequality, prime number, composite number, prime factorization, equivalent fractions, simplest form, rational number, multiplicative inverse, ratio, rate, unit rate, proportion, cross product, proportion, similar figures, congruent figures, scale drawings, scale models, outcomes, event, probability, odds in favor, odds against, theoretical probability experimental probability, counting principles, percent, percent of change, markup, discount, interest, simple interest, compound interest, relation, domain, range, input, output, linear, square root, perfect square, Pythagorean Theorem, polygon, regular, slant height, lateral area, net, surface area, combination, permutation, n factorial, disjoint, complementary, independent, dependent, transversal, angles

Assessments

Ongoing and throughout unit of study; assessments may include:

- Informal assessments
- Teacher-based assessments
- Suggested assessments

Specific interim assessments; formats may vary.

- Standardized End of Unit Assessments
- Standardized Mid Term Assessments

Course Resources:

- Technologies: COWS, Chrome Books SMART Boards, Notebook software, NJCTL website, Power School
- Text: McDougal Littell Pre-Algebra
Big Ideas Math – Red (Supplementary)
- Other: Study Island, Teacher made/workbook resources

CURRICULUM OVERVIEW: CONCEPTS OF ALGEBRA



Content Area: Mathematics

Course Title: Concepts of Algebra

Course Description or Content Overview:

Concepts of Algebra Course which covers 8th grade math standards.

Course Rationale:

This program is an 8th grade on level course, and a 7th grade accelerated course, offered through both a conceptual and skill-based approach. The foundation of the program is the Common Core Standards for Mathematical Content and Standards for Mathematical Practice. The approach encourages abstract thought, reasoning, and inquiry as students persevere to answer Essential Questions.

Primary Interdisciplinary Connections:

Language Arts, Science, Social Studies, Physical Education, Art, Astronomy, Architecture and Technology.

21st Century Connections

S= Skills; A= Awareness; L= Literacy; T= Traits

- S Critical Thinking & Problem Solving, Creativity & Innovation, Communication & Collaboration, Core Ethical Values
- A Global, Cross Cultural, Career
- L Content, Financial, Civic, Health, Information, Technology, Media
- T Initiative, Productivity, Accountability, Self Direction, Humor, Resilience, Perseverance, Responding with wonderment and awe, Kindness, Respect, Service to Others, Responsible risk-taking, Manners, Responsibility, Empathy

Standards:

The curriculum is written in the Understanding by Design format and is based on enduring understandings, essential questions and both formative and summative assessments.

The math standards are broken into two categories: Content and Process.

Content Standards on **what** we want students to know:

THE NUMBER SYSTEM

8.NS.1 –Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion

repeats eventually and convert a decimal expansion which repeats eventually into a rational number

- 8.NS.2** – Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions

EXPRESSIONS AND EQUATIONS

- 8.EE.1** – Know and apply the properties of integer exponents to generate equivalent numerical expressions
- 8.EE.2** – Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that the square root of 2 is irrational
- 8.EE.3** – Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other
- 8.EE.4** – Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities
- 8.EE.5** – Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways
- 8.EE.6** – Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .
- 8.EE.7** – Solve linear equations in one variable
- 8.EE.8** – Analyze and solve pairs of simultaneous equations

FUNCTIONS

- 8.F.1** – Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output
- 8.F.2** – Compare properties of two functions each represented in a different way
- 8.F.3** – Interpret the equation $y = ms + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.
- 8.F.4** – Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x,y) values
- 8.F.5** – Describe qualitatively the functional relationship between two quantities by analyzing a graph. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

GEOMETRY

- 8.G.1** – Verify experimentally the properties of rotations, reflections, and translations
- 8.G.2** – Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures describe a sequence that exhibits the congruence between them
- 8.G.3** – Describe the effect of dilations, translations, rotations, and reflections on 2D figures using coordinates
- 8.G.4** – Understand that a 2D figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar 2D figures, describe a sequence that exhibits the similarity of triangles

- 8.G.5** – Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles
- 8.G.6** – Explain a proof of the Pythagorean Theorem and its converse
- 8.G.7** – Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
- 8.G.8** – Apply the Pythagorean Theorem to find the distance between two points in a coordinate system
- 8.G.9** – Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world mathematical problems

STATISTICS AND PROBABILITY

- 8.SP.1** – Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
- 8.SP.2** – Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line
- 8.SP.3** – Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept
- 8.SP.4** – Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe an association between the two variables.

TECHNOLOGY

- 8.1.4.A.5** Determine the benefits of a wide range of digital tools by using them to solve problems.
- 8.1.8.A.5** Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.

21st CENTURY THEMES

- 9.1.4.A** Critical thinking and problem solving
- 9.1.8.B** Creativity and innovation
- 9.1.8.C** Collaboration, teamwork and leadership
- 9.1.8.D** Cross-cultural understanding and interpersonal communication
- 9.1.8.E** Communication and Media Fluency
- 9.1.8.F** Accountability, Productivity and Ethics
- 9.3.4.A** Career awareness

Process Standards indicate **how** we want students to learn:

Mathematical Practice:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.

- Look for and express regularity in repeated reasoning.

A complete copy of the standards for Grade 8 may also be found at:

[Common Core State Standards Initiative \(CCSSI\)](#)

Enduring Understandings:

- Number System
 - Squares and radicals can help solve real world problems
 - Squares and radicals affect the numbers that are being used within an operation
 - The rules for radicals can be applied to variable expressions
- Expressions and Equations
 - How to solve an equation in one variable be solved for that variable
 - How to solve an equation for a variable in the equation
 - Various methods can be used to solve equations and the solution to an equation can be checked by substituting into the original equation
- Functions
 - The definition of a function and what it's graph represents
 - Properties of functions and their graphs are similar but not identical
 - Slope-intercept form is an easy way of graphing functions
 - The ability to graph a function and write a function from a graph
- Geometry
 - Congruent figures can be formed by a series of transformations
 - Similar figures can be formed by a series of transformations
 - Understand angle relationships in one and two-dimensional figures
 - The Pythagorean Theorem can be used to solve real world problems
 - The Pythagorean Theorem aids in solving problems involving right triangles
 - There are different formulas that can be used when solving for the volume of a 3D figure
- Statistics and Probability
 - Scatter plots, line of best fit, and frequencies all help interpret data within a problem
 - Patterns can be modeled using different graphs
 - Straight lines are widely used to model relationships

Essential Questions

- Number System
 - What is the difference between rational and irrational numbers?
 - How do radicals and squares help solve real world problems?
 - How are radicals and squares useful for solving equations and manipulating numbers?
- Expressions and Equations
 - How will scientific notation help when writing numbers and equations?
 - How is scientific notation used in real world application problems?
 - How are numbers compared and manipulated using scientific notation?
 - How can the value of an unknown variable be found?
 - What is meant by the slope of a line, and how can knowing a line's slope help to graph a line and find parallel and perpendicular lines?
 - How can real world situations be modeled by systems? How can solutions be found to a system?
- Functions
 - What is a function?
 - How are functions represented?

- What can a relationship between numbers tell about a problem?
- Are properties of functions and graphs the same for all functions?
- Geometry
 - How can you use models of one and two-dimensional figures to show congruent figures?
 - How can you use models of one and two-dimensional figures to show similar figures?
 - How does the Pythagorean Theorem help solve real world problems?
 - How do we compute the distance and midpoint within problems?
 - What is a 3-dimensional figure?
 - How can I find the volume of a 3D figure?
 - How can the volume of a 3D figures help me solve real world problems?
- Statistics and Probability
 - How can information from a problem be represented in a way to see a pattern or a frequency?
 - What is a line of best fit and how can it supply a conclusion?
 - Are interpretation and predication an accurate conclusion for a problem?

Unit Objectives

- Number System
 - Students will be able to find the squares and square roots of both rational and irrational numbers
 - Students will know the perfect squares. They will also be able to simplify perfect square radical expressions as well as non-perfect square radicands
 - Students will use the perfect squares to approximate square roots
 - Students will be use their understanding of square roots to simplify roots of variables
 - Students will understand the properties of exponents and will use them to solve equations with perfect square and cube roots
- Expressions and Equations
 - Students will be able to solve equations
 - Students will be able to transform a formula to a different form of that equation
 - Students will express numbers using scientific notation
 - Students will recognize the difference between scientific notation and standard form
 - Students will distinguish the difference between different numbers written in scientific notation
 - Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation
 - Students will be able to graph a line given different forms of the equation
 - Students will be able to identify parallel and perpendicular lines from their slopes
 - Students will be able to describe how slope relates to horizontal and vertical lines
 - Students will be able to graph systems of linear equations or to find a solution
 - Students will be able to translate real world problem into a system
 - Students will be able to solve a system of equations by using substitution and elimination
- Functions
 - Students will understand what a function is and its corresponding graph
 - Students will compare properties of different functions and relate the information to real world situations
 - Students will graph slope-intercept form of a line

- Students will construct a function and determine the rate of change and initial value
- Students will describe a functional relationship by examining a graph
- Geometry
 - Students will be able to transform figures on a coordinate plane
 - Students will be able to use their understanding of angle relationships to find unknown angles
 - Students will be able to describe a sequence of transformations that will result in congruent figures
 - Students will be able to describe a sequence of transformations and dilations that will result in similar figures
 - Students will be able to explain the proof of the Pythagorean Theorem
 - Students will find unknown side lengths using the Pythagorean Theorem
 - Students will use the Pythagorean Theorem to solve problems involving distance and midpoints
 - Students will solve real world application problems using the Pythagorean Theorem
 - Students will identify what a 3-dimensional figure is
 - Students will use a formula to find the volume of a prism and cylinder
 - Students will use a formula to find the volume of pyramids, cones, and spheres
- Statistics and Probability
 - Students will be able to graph scatter plots
 - Students will interpret and examine data to come to a conclusion
 - Students will know about line of best fit and two variable data relationships
 - Students will understand patterns of association in bivariate categorical data
 - Students will use frequency to solve real life problems and make predictions for future ones

Terminology:

Numerical expression, variable, variable expression, evaluate, powers, exponent, base, squared, square root, cube, cube root, order of operations, integers, absolute value, coordinate plane, ordered pair, like terms, equations, inverse operations, equations, linear inequality, equivalent fractions, simplest form, rational number, irrational numbers, multiplicative inverse, ratio, rate, unit rate, proportion, cross product, similar figures, congruent figures, scale drawings, scale models, function, relation, mapping, domain, range, input, output, linear, perfect square, Pythagorean Theorem, legs, hypotenuse, distance, polygon, regular, surface area, volume, complementary, supplementary, corresponding, alternate interior, alternate exterior, transversal, angles, translation, reflection, rotation, symmetry, dilation, scale factor, slope, intercepts, rise over run, standard form, parallel, perpendicular, scatter plots, frequency, correlation

Assessments

Ongoing and throughout unit of study; assessments may include:

- Informal assessments
- Teacher-based assessments
- Suggested assessments

Specific interim assessments; formats may vary.

- Standardized End of Unit Assessments
- Standardized Quarterly Assessments
- Standardized Mid Term Assessments

Course Resources:

- Technologies: COWs, SMART Boards, Notebook Software, Power School, Performance Matters, Chromebooks, wikis, online videos
- Text: McDougal Littell Algebra
Big Ideas Math – Blue (Supplementary)
- Other: Study Island; Teacher made worksheets and projects

CURRICULUM OVERVIEW: ALGEBRA I



Textbook: Algebra I Holt McDougal Common Core Edition 2012

Curriculum: This is located in the Core Course Curriculum for the High School.

The Pacing Chart that follows is the one used in the middle school for delivery of Algebra I curriculum.

<p>Trimester I Concepts found in: Chapters 1, 2, 3, 4, and Sections 5.1 - 5.4</p> <p>*Two-week review of Chapters 1 and 2</p> <p><u>Chapter 1</u> 1.1 Variables In Algebra 1.2 Solving Equations with +, - 1.3 Solving Equations with *, / 1.4 Solving Multi-Step Equations 1.5 Solving Equations with Variables on Both Sides 1.6 Solving for a Variable 1.7 Solving Absolute Value Equations 1.8 Rates, Ratios & Proportions 1.9 Applications of Proportions 1.10 Precision & Accuracy</p> <p><u>Chapter 2</u> 2.1 Graphing & Writing Inequalities 2.2 Solving Inequalities with +, - 2.3 Solving Inequalities with *, / 2.4 Solving Multi-Step Inequalities</p>	<p>Trimester II Concepts found in: Sections 5.5 and 5.6, Chapters 6, 7, and Sections 8.1 – 8.4</p> <p><u>Chapter 5</u> 5.5 Solving Linear Inequalities 5.6 Solving Systems of Linear Inequalities</p> <p><u>Chapter 6</u> 6.1 Integer Exponents 6.2 Rational Exponents 6.3 Polynomials 6.4 +, - Polynomials 6.5 Multiplying Polynomials 6.6 Special Products of Polynomials</p> <p><u>Chapter 7</u> 7.1 Factors & GCF 7.2 Factoring by GCF 7.3 Factoring $x^2 + bx + c$ 7.4 Factoring $ax^2 + bx + c$ 7.5 Factoring Special Products 7.6 Choosing a Factoring Method</p> <p><u>Chapter 8</u> 8.1 Identifying Quadratic Functions 8.2 Characteristics of</p>	<p>Trimester III Concepts found in: Sections 8.5 – 8.9, Chapters 9 and 10</p> <p><u>Chapter 8</u> 8.5 Solving Quadratic Equations by Graphing 8.6 Solving Quadratic Equations by Factoring 8.7 Solving Quadratic Equations by Using Square Roots 8.8 Completing the Square 8.9 The Quadratic Formula & Discriminant</p> <p><u>Chapter 9</u> 9.1 Geometric Sequences 9.2 Exponential Functions 9.3 Exponential Growth & Decay 9.4 Linear, Quadratic, and Exponential Models 9.5 Comparing Functions</p> <p><u>Chapter 10</u> 10.1 Organizing & Displaying Data 10.2 Frequency & Histogram 10.3 Data Distributions</p>
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2.5 Solving Inequalities with Variables on Both Sides 2.6 Solving Compound Inequalities 2.7 Solving Absolute Value Inequalities *Summer Packet Quiz Chapter 3 3.1 Graphing Relationships 3.2 Relations & Functions 3.3 Writing Functions 3.4 Graphing Functions 3.5 Scatter Plots & Trend Lines 3.6 Arithmetic Sequences Chapter 4 (Skip 4.10) 4.1 Identifying Linear Functions 4.2 Using Intercepts 4.3 Rate of Change & Slope 4.4 The Slope Formula 4.5 Direct Variation 4.6 Slope Intercept Form 4.7 Point-Slope Form 4.8 Line of Best Fit 4.9 Slopes of Parallel & Perpendicular Lines Chapter 5 5.1 Solving Systems by Graphing 5.2 Solving Systems by Substitution 5.3 Solving Systems by Elimination 5.4 Solving Special Systems	Quadratic Functions 8.3 Graphing Quadratic Functions 8.4 Transforming Quadratic Functions	10.4 Misleading Graphs & Statistics 10.5 Experimental Probability 10.6 Theoretical Probability 10.7 Independent & Dependent Events
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TRIMESTER GRADES will be determined using the below category weights:

Tests	35%	(50)	<i>Each Chapter or large portions of data (always pre-announced)</i>
Quizzes	30%	(30)	<i>Each Chapter and small portions of data (announced and pop quizzes)</i>
Classwork	20%	(10)	<i>Classroom activities & labs (team work activities)</i>
Homework	15%	(10)	<i>Daily effort & follow up activities</i>

CURRICULUM OVERVIEW: GEOMETRY AND ALGEBRA II



Curriculum: This is located in the Core Course Curriculum for the High School.

South Brunswick School District



DISTRICT APPENDIX

There are the various strands that cross content.

They have relevance to every curricular area and all grade levels.

The strands are interwoven into content and integrated into instruction.

They do not stand alone.

A synopsis of each strand is included in this document.

**The full SBSB K-12 District Appendix, with detailed information about each strand,
can be found as a separate document.**

Topics

Teaching for the 21st Century

Educational Technology Standards

21st Century Life and Career Education Skills

Character Education

Differentiation

Understanding by Design (UbD): “Reader’s Digest” Version

Topic**Teaching for the 21st Century:****What does this mean and how do you do it?**

Students need to gain skills that will enable them to learn on their own, think critically and creatively, and apply knowledge to new situations. An emphasis needs to be placed on problem solving, teamwork skills, global awareness, and proficiency in using technology. Students need to learn to collaborate and work on authentic problems that they will likely encounter in their future careers. This section will outline what this means and how you “teach” for the 21st century: Elementary, Middle and High.

Tools for the 21st Century:**Life, Careers, and Digital Environments**

21st Century Life and Career Education Skills and Educational Technology Skills outline the NJ Core Curriculum Content Standards for these areas that align with PK-12 learning.

These standards are written into the curriculum documents for all areas of content—English Language Arts, Mathematics, Science, Social Studies, PE/Health Education, Visual Art, Music, World Language and Library-Media. They are integrated into curriculum and instruction in places where it is relevant and meaningful to do so, and in ways that enhance learning. You will see these integrations explicitly noted in the curriculum guides: Elementary, Middle and High.

Character Education:**Safe and Caring Learning Communities**

South Brunswick takes an “approach” to character education that fosters the social, emotional and academic growth of each child. The intent is to create a safe and caring community while building life skills based on the five core values (CARES):

- C Cooperation
- A Assertion
- R Responsibility (and Respect)
- E Empathy
- S Self-Control

For over ten years, the K-5 teachers have been trained in and have followed the *Responsive Classroom (RC)* approach.

The middle school teachers have studied and/or been trained in the *Developmental Designs (DD)* approach to character education.

The high school approach has been named “Strive for Five” and includes an annual theme with related activities to bring Character Education to the forefront. There is always a service-learning project connected to the theme. In addition, the high school also follows the *Institute of Excellence and Ethics* (IEE) approach. The IEE approach allows for explicit teaching of Character Education through a series of multimedia lessons that are embedded into the students’ schedules.

Differentiation

Differentiation of instruction is a deliberate and conscious method of planning and teaching that provides multiple avenues of learning. It means different challenges to different students. It is characterized by strategies that use an assessment of each individual student for readiness, interest and learning style to modify instruction in three ways: by content, process and product.

In this document, there is a brief description of several approaches and methods that have long been utilized in South Brunswick to meet the differentiated needs of students within the classroom.

- Bloom’s Taxonomy
- Gardner’s Multiple Intelligences
- Learning Styles
- Inclusion Classrooms
- Kagan Cooperative Learning
- Principles of Differentiation

It is expected that classroom instruction will be differentiated. This expectation is predicated upon the belief or disposition that “all students can learn.”

Understanding by Design

For nearly two decades, the South Brunswick School District has held much value in the Understanding by Design (UbD) or Backward Design model of curriculum writing by Grant Wiggins. This model and the process of curriculum development, has been used in the district for many years. The curriculum template—which was recommended by the State of NJ and adopted/adapted by the District, includes elements of the UbD approach.)

You will note that in every curricular area, we begin with the end in mind (that is, the big idea). Enduring understandings, essential questions and performance assessments—all based on standards-- are used in the process of curriculum development.

With this being said, it is not only important to understand the process of UbD, but also how to implement curriculum designed in such a way.

A brief overview of how to use Understanding by Design in delivering curriculum is included in the Appendix.