



Curriculum

Math
Grade 5

Estell Manor School District

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Accommodations and Modifications for students who are classified as Gifted and Talented Students:

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Accommodations and Modifications for students who are classified with 504's:

Accommodations and Modifications for students who are classified with IEP's:

Accommodations and Modifications for students at risk of failing:

Estell Manor School

This document reflects the collaboration of teachers, staff, students, parents, and the Board of Education to define our mission to guide our work.

Our Mission:

Supported by home and community, Estell Manor School is to be a model of excellence in developing all students academically, emotionally, physically, and socially; thus empowering students to become lifelong learners who compete in and contribute to a global society.

This curricula and accompanying instructional materials have been developed to align with the NJSLS and in accordance with the NJ Department of Education's guidelines to include: Curriculum designed to meet grade level expectations, integrated accommodations and modifications for students with IEPs, 504s, ELLs, and gifted and talented students, assessments including benchmarks, formative, summative, and alternative assessments, a list of core instructional and supplemental materials, pacing guide, interdisciplinary connections, integration of 21st century skills, integration of technology, and integration of 21st Century Life and Career standards.

About the Standards

In 1996, the New Jersey State Board of Education adopted the state's first set of academic standards called the Core Curriculum Content Standards. The standards described what students should know and be able to do upon completion of a thirteen-year public school education. Over the last twenty years, New Jersey's academic standards have laid the foundation for local district curricula that are used by teachers in their daily lesson plans.

Revised every five years, the standards provide local school districts with clear and specific benchmarks for student achievement in nine content areas. Developed and reviewed by panels of teachers, administrators, parents, students, and representatives from higher education, business, and the community, the standards are influenced by national standards, research-based practice, and student needs. The standards define a "Thorough and Efficient Education" as guaranteed in 1875 by the New Jersey Constitution. Currently the standards are designed to prepare our students for college and careers by emphasizing high-level skills needed for tomorrow's world.

The New Jersey Student Learning Standards include Preschool Teaching and Learning Standards, as well as nine K-12 standards for the following content areas: **21st Century Life and Careers, Comprehensive Health and Physical Education, English Language Arts, Mathematics, Science, Social Studies, Technology, Visual and Performing Arts, World Languages.** The most recent review and revision of the standards occurred in 2014. However, the standards in language arts and math underwent an additional review in 2015 with adoption by the New Jersey State Board of Education in May 2016.

**Estell Manor School
Math: 5th grade**

Pacing Guide

Course Title: Math		Grade level: 5th Grade	
Topic	Unit of Study	Topic	Unit of Study
1	Place Value: 12 days	9	Apply understanding of division to Divide Fractions: 13 days
2	Adding & Subtracting Decimals to Hundredths: 12 days	10	Understand Volume Concepts: 10 days
3	Fluently Multiply Multi Digit Whole Numbers: 12 days	11	Convert Measurements: 14 days
4	Use Models and Strategies to Multiply Decimals: 15 days	12	Represent and Interpret Data: 9 days
5	Use Models and Strategies to Divide Whole Numbers: 13 days	13	Algebra: Write and Interpret Numerical Expressions: 8 days
6	Use Models and Strategies to Divide Decimals: 14 days	14	Graph Points on the Coordinate Plane: 7 days
7	Use Equivalent Fractions to Add and Subtract Fractions: 18 days	15	Algebra: Analyze Patterns and Relationships: 7 days
8	Apply understanding of multiplication to Multiply Fractions: 14 days	16	Geometry Measurement: Classify Two-Dimensional Figures: 7 days
Instruction Materials/Additional Resources: Math 5-8/Algebra/EnVision 2.0 Math/Scott Foresman/2020 Classroom Manipulatives, EDC Calendar Math activities, GregTangMath.com, http://www.mathgoodies.com, http://www.funbrain.com, http://www.mathplayground.com, http://www.mathsisfun.com, http://www.gamequarium.com, http://www.vestorkids.com, http://www.mathwire.com			

Estell Manor School
5th grade Math Curriculum
Overview

Content Area: Math Topic 1

Topic 1: 12 Days

Unit Title: Place Value

Grade Level: 5th grade

NJSLS Addressed: 5.NBT.A Number and Operations in Base Ten

- 5.NBT.A Understand the place value system

Topic 1 Summary

Essential Questions:

- How does understanding place value help us to perform operations, particularly with multiplication and division?
- Why is the place value of numbers important?

Enduring Understandings:

- Understanding place value allows us to efficiently multiply and divide by multiples of ten.
- Understanding the Base Ten Place value system contributes to understanding the value of digits in numbers, and with each move to the left the digit is ten times larger.

Learning Targets

Students will be able to understand:

- Recognize that in multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left.

Students will be able to demonstrate:

- Use base ten blocks, pictures of base ten blocks, and interactive images of base ten blocks to manipulate and investigate the place value relationships. They use their understanding of unit fractions to compare decimal places and fractional language

- Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
- Read, Write, and compare decimals to thousandths.
 - a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
 - b. Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.
- Use place value understanding to round decimals to any place.

Sample Assessments

To show evidence of meeting this standard, students will:

Recognize that in multi-digit numbers, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10.

Use whole number exponents to denote powers of 10.

to describe those comparisons.

- Consider the relationship of decimals and fractions by expressing their understanding that in multi-digit whole numbers, a digit in one place represents 10 times what it represents in the place to its right and 1/10 of what it represents in the place to its left.
- Use a model of one unit; they cut it into 10 equal pieces, shade in, or describe 1/10 of that model using fractional language (“This is 1 out of 10 equal parts. So it is 1/10”. I can write this using 1/10 or 0.1”). They repeat the process by finding 1/10 of a 1/10 (e.g., dividing 1/10 into 10 equal parts to arrive at 1/100 or 0.01) and can explain their reasoning, “0.01 is 1/10 of 1/10 thus is 1/100 of the whole unit.”
- In the number 55.55, each digit is 5, but the value of the digit is different because of the placement.

<u>5</u>	<u>5</u>	.	<u>5</u>	<u>5</u>
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- The 5 that the arrow points to is 1/10 of the 5 to the left and 10 times the 5 to the right. The 5 in the ones place is 1/10 of 50 and 10 times five tenths.

<u>5</u>	<u>5</u>	.	<u>5</u>	<u>5</u>
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- The 5 that the arrow points to is 1/10 of the 5 to the left and 10 times the 5 to the right. The 5 in the tenths place is 10 times five hundredths.

The teacher might write:

$$36 \times 10 = 36 \times 10^1 = 360$$

$$36 \times 10 \times 10 = 36 \times 10^2 = 3600$$

$$36 \times 10 \times 10 \times 10 = 36 \times 10^3 = 36,000$$

$$36 \times 10 \times 10 \times 10 \times 10 = 36 \times 10^4 = 360,000$$

might write:

$$36 \times 10 = 36 \times 10^1 = 360$$

$$36 \times 10 \times 10 = 36 \times 10^2 = 3600$$

$$36 \times 10 \times 10 \times 10 = 36 \times 10^3 = 36,000$$

$$36 \times 10 \times 10 \times 10 \times 10 = 36 \times 10^4 = 360,000$$

	might think and/or say: I noticed that every time I multiplied by 10 I added a zero to the end of the number. That makes sense because each digit's value became 10 times larger. To make a digit 10 times larger, I have to move it one place value to the left. When I multiplied 36 by 10, the 30 became 300. The 6 became 60 or the 36 became 360. So I had to add a zero at the end to have the 3 represent 3 one-hundreds (instead of 3 tens) and the 6 represents 6 tens (instead of 6 ones). Should be able to use the same reasoning as above to explain why the following multiplication and division problem by powers of 10 make sense. $523 \times 10^3 = 523,000$ The place value of 523 is increased by 3 places. $5.223 \times 10^2 = 522.3$ The place value of 5.223 is increased by 2 places. $52.3 \div 10^1 = 5.23$ The place value of 52.3 is decreased by one place.
Integrated Modifications: • One to one technology • Students work at own pace on lessons • Small group instruction (teachers pull back if students need help) • Peer to peer help	
Content Area: Math Topics 2, 3, 4, 5 & 6	Topic 2: 12 days Topic 3: 12 days Topic 4: 15 days Topic 5: 13 days Topic 6: 14 days
Unit Title: Adding and Subtracting Decimals to Hundredths/Fluently Multiply Multi-Digit Whole Numbers/Use Models and strategies to Multiply Decimals, Use Models and Strategies to Divide Whole Numbers, Use Models and Strategies to Divide Decimals	
Grade Level: 5th grade	
NJSLA Addressed: Perform operations with multi-digit whole numbers and with decimals to hundredths	

Topic 2-6 Summary

Essential Questions:

- Why is the standard algorithm for multiplying multi-digit whole numbers a shortcut to partial products?
- Why do you use a standard algorithm for multiplying multi-digit whole numbers?
- How can multiplication, division, addition and subtraction of decimal numbers be modeled?

Enduring Understandings:

- Standard algorithms are efficient methods for performing calculations.
- Rectangular arrays, area models and/or equations are effective methods for illustrating and developing conceptual understanding of arithmetic calculations.
- The relationship between multiplication and division can be used to find whole-number quotients of multi-digit dividends and divisors.

Learning Targets

Students will be able to understand:

- Fluently multiply multi-digit whole numbers using the standard algorithm.
- Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
- Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used

Sample Assessments

To show evidence of meeting this standard, students will:

Evaluate expressions such as those listed below:

• $3.6 + 1.7$

A student might estimate the sum to be larger than 5 because 3.6 is more than 3. And 1.7 is more than 1.

• $5.4 - 0.8$

A student might estimate the answer to be a little more than 4.4 because a number less than 1 is being subtracted.

• 6×2.4

A student might estimate an answer between 12 and 18 since 6×2 is 12 and 6×3 is 18.

Students will be able to demonstrate:

- Standard NBT 5 refers to fluency which means accuracy (correct answer), efficiency (a reasonable amount of steps), and flexibility (using strategies such as the distributive property or breaking numbers apart also using strategies according to the numbers in the problem, 26×4 may lend itself to $(25 \times 4) + 4$ where as another problem might lend itself to make an equivalent problem $32 \times 4 = 64 \times 2$)).
- This standard builds upon students' work with multiplying numbers in third and fourth grade. In fourth grade, students developed understanding of multiplication through using various strategies. While the standard algorithm is mentioned, alternative strategies are also appropriate to help students develop conceptual understanding. The size of the numbers should NOT exceed a three-digit factor by a two-digit factor.
- Standard NBT 6 demonstrates division problems can include remainders. Even though this standard leads more towards computation, the connection to story contexts is critical. Make sure students are exposed to problems where the divisor is the number of groups and where the divisor is the size of the groups. In fourth grade, students' experiences with division were limited to dividing by one-digit divisors.
- This standard extends students' prior experiences with strategies, illustrations, and explanations. When the two-digit divisor is a "familiar" number, a student might decompose the dividend using place value.
- Standard NBT 7 builds on the work from fourth grade where students are introduced to decimals and compare them. In fifth grade, students begin adding, subtracting, multiplying and dividing decimals. This work should focus on concrete models and pictorial representations, rather than relying solely on the algorithm. The use of symbolic notations involves having students record the

Another student might give an estimate of a little less than 15 because s/he figures the answer to be very close, but smaller than 6×2.5 and think of 2 groups of 6 as 12 (2 groups of 6) + 3 (.5 of a group of 6). Students should be able to express that when they add decimals they add tenths to tenths and hundredths to hundredths. So, when they are adding in a vertical format, it is important that they write numbers with the same place value beneath each other. This understanding can be reinforced by connecting addition of decimals to their understanding of addition of fractions. Adding fractions with denominators of 10 and 100 is a standard in fourth grade. (These examples taken directly from: http://www.dpi.state.nc.us/docs/acre/standards/common-core-tools/unpacking/math/5th.pdf)	answers to computations ($2.25 \times 3 = 6.75$), but this work should not be done without models or pictures. • This standard includes students' reasoning and explanations of how they use models, pictures, and strategies. • This standard requires students to extend the models and strategies they developed for whole numbers in grades 1-4 to decimal values. Before students are asked to give exact answers, they should estimate answers based on their understanding of operations and the value of the numbers.
Integrated Modifications: • One to one technology • Students work at own pace on lessons • Small group instruction (teachers pulls back if students need help) • Peer to peer help	
Content Area: Math Topic 7	Topic 7: 18 days
Unit Title: Use Equivalent Fractions to Add and Subtract Fractions	
Grade Level: 5th grade	
NJSLS Addressed: 5.NF Number and Operations- Fractions; Cluster: use equivalent fractions as a strategy to add and subtract fractions	

Topic 7 Summary

Essential Questions:

- Why does the denominator play an important role when adding and subtracting fractions?

Enduring Understandings:

- When adding and subtracting fractions it is implied that the whole is the same.
- When adding and subtracting fractions, having the same denominator produces the same size parts.
- When adding and subtracting fractions with unlike denominators, a common denominator can be made by using equivalent fractions, which keeps the value of each fraction the same.

Learning Targets

Students will be able to understand:

- Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, $\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}$. (In general, $\frac{a}{b} + \frac{c}{d} = \frac{ad+bc}{bd}$.)*
- Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result $\frac{2}{5} + \frac{1}{2} = \frac{3}{7}$, by observing that $\frac{3}{7} < \frac{1}{2}$.*

Sample Assessments

To show evidence of meeting this standard, students will:

- apply their understanding of equivalent fractions and their ability to rewrite fractions in an equivalent form to find common denominators. They should know that multiplying the denominators will always give a common denominator but may not result in the smallest denominator.
- Solve problems in such a manner as $\frac{5}{8}$ is greater than $\frac{6}{10}$ because $\frac{5}{8}$ is $\frac{1}{8}$ larger than $\frac{1}{2}$ ($\frac{4}{8}$) and $\frac{6}{10}$ is only $\frac{1}{10}$ larger than $\frac{1}{2}$ ($\frac{5}{10}$)
- Solve problems such as: Your teacher gave you $\frac{1}{7}$ of the bag of candy. If you and your friend $\frac{1}{3}$ of the bag of candy. If you and your friend combined your candy, what fraction of the bag would you have?
- Estimate your answer and then calculate. How reasonable was your estimate?

Students will be able to demonstrate:

- build on the work in fourth grade where students added fractions with like denominators. In fifth grade, the example provided in the standard has students find a common denominator by finding the product of both denominators.
- Improve their number sense, which means students' understanding of fractions as numbers that lie between whole numbers on a number line. Number sense in fractions also includes moving between decimals and fractions to find equivalents, also being able to use reasoning such as $\frac{7}{8}$ is greater than $\frac{3}{4}$ because $\frac{7}{8}$ is missing only $\frac{1}{8}$ and $\frac{3}{4}$ is missing $\frac{1}{4}$ so $\frac{7}{8}$ is closer to a whole. Also, students may use benchmark fractions to estimate and examine the reasonableness of their answers.

(These examples taken directly from: http://www.dpi.state.nc.us/docs/acre/standards/common-core-tools/unpacking/math/5th.pdf)	
Integrated Modifications: • One to one technology • Students work at own pace on lessons • Small group instruction (teachers pulls back if students need help) • Peer to peer help	
Content Area: Math Topic 8 & 9	Topic 8: 14 days Topic 9: 13 days
Unit Title: Apply understanding of multiplication to Multiply Fractions/Apply understanding of division to Divide Fractions	
Grade Level: 5th grade	
NJSLs Addressed: Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	

Topic 8 & 9 Summary

Essential Questions:

- Can a product be smaller than its factors?
- Why is it important to be able to model multiplication and division of fractions?

Enduring Understandings:

- A whole number multiplied by a proper fraction results in a product that is smaller than itself.
- A whole number divided by a proper fraction results in a quotient that is larger than itself.
- Multiplying a whole number by a fraction involves division, as the product is a fraction of the whole number.
- Strategies and models used in whole number multiplication and division can be applied to fractions.

Learning Targets

Students will be able to understand:

- Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent that problem. For example, interpret $\frac{3}{4}$ as the result of dividing 3 by 4, noting that $\frac{3}{4}$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $\frac{3}{4}$. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?

Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

- Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts: equivalently, as the result of a sequence of operations $a \times q \div b$. For example, use a visual fraction model to show $(\frac{2}{3}) \times 4 = \frac{8}{3}$, and create a story context for this equation. Do the same with $(\frac{2}{3}) \times (\frac{4}{5}) = \frac{8}{15}$. (In general, $(a/b) \times (c/d) = ac/bd$.)
- Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

Students will be able to demonstrate:

Instructional Guidance

To assist in meeting this standard, students may:

- Use fractions to represent division of whole numbers such as $5 \div 4 = 5/4$
- Locate and place fractions on a number line
- Multiply fractions by a whole number
- Use compatible numbers to round and estimate multiplication and division of fractions
- Use the standard algorithm to multiply two fractions ($a/b \times c/d = (a \times c)/(b \times d)$)
- Apply unit squares to represent multiplication of fractions and areas of rectangles.
- Multiply mixed numbers by converting factors to improper fractions
- Compare the product and one given fractional factor estimate the unknown factor
- Divide whole numbers by fractions using the standard algorithm (using reciprocal)
- Model division of fractions by whole numbers and division of whole numbers by fractions with manipulatives such as fraction model strips, circle patterns, centimeter grids, or graph paper

Sample Assessments

To show evidence of meeting this standard, students will:

- By the end of the year, be able to represent division of whole numbers as a fraction
- By the end of the year, be able to multiply fractions and whole numbers by another fraction
- By the end of the year, be able to find the area of a rectangle with fractional side

Interpret multiplication as scaling (resizing), by:

- a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
- b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times 1)/(n \times b)$ to the effect of multiplying a/b by 1.

Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Apply and extend previous understanding of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

- a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.
- b. Interpret division of a whole number by unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.
- c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share $\frac{1}{2}$ lb of chocolate equally? How many $\frac{1}{3}$ – cup servings are in 2 cups of raisins?

lengths

- By the end of the year, be able to estimate an unknown factor when given a product and a factor that is a fraction
- By the end of the year, be able to explain how multiplication can result in a product that is smaller than one or both of the factors
- By the end of the year, be able to solve real world problems involving multiplication of fractions and mixed numbers
- By the end of the year, be able to explain how division can result in a quotient that is greater than one or both of the inputs
- By the end of the year, be able to model and explain how division of whole numbers by fractions and division of fractions by whole numbers relates to multiplication
- By the end of the year, be able to apply the standard algorithm of multiplying by the reciprocal of the divisor to divide fractions by whole numbers and whole numbers by fractions
- By the end of the year, be able to solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem

Integrated Modifications: • One to one technology • Students work at own pace on lessons • Small group instruction (teachers pulls back if students need help) • Peer to peer help	
Content Area: Math Topic 10	Topic 10: 10 days
Unit Title: Understand Volume Concepts	
Grade Level: 5th grade	
NJSLs Addressed: 5MD Measurement and Data Cluster: Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	

Topic 10 Summary

Essential Questions:

- What are the attributes of an object that has volume?

Enduring Understandings:

- Volume is measured in cubic units.
- Volume is determined by the amount of cubic units that fit into a three dimensional object.
- The formula for calculating volume of a rectangular prism is directly connected to its physical shape.

Learning Targets

Students will be able to understand:

- Recognize volume as an attribute of solid figures and understanding concepts of volume measurement.
 - a. A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume.
 - b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have volume of n cubic units.

Students will be able to demonstrate:

- Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
- Relate volume to the operations of multiplication and addition and solve real world mathematical problems involving volume.
 - a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
 - b. Apply the formula $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
 - c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

Integrated Modifications: • One to one technology • Students work at own pace on lessons • Small group instruction (teachers pulls back if students need help) • Peer to peer help	
Content Area: Math Topic 11	Topic 11: 14 days
Unit Title: Convert Measurements	
Grade Level: 5th grade	
NJSLs Addressed: Convert like measurement units within a given measurement system	
Topic 11 Summary	
Essential Questions: • Why is it important to convert measurement units in a given measurement system?	Enduring Understandings: • A measurement can be converted to a different unit with the two measurements representing the same amount.
Learning Targets	
Students will be able to understand: • Convert among different sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	Students will be able to demonstrate: • Solve multi-step problems where they use conversion to solve • Sample Assessments

Sample items aligned to Common Core http://www.illustrativemathematics.org/standards/k8 1. Five brothers are going to take turns watching their family’s new puppy. How much time will each brother spend watching the puppy in a single day if they are all watch him for an equal length of time? Write your answer a. Using only hours, b. Using a whole number of hours and a whole number of minutes, and c. Using only minutes 2. Mrs. Hinojos had 75 feet of ribbon. If each of the 18 students in her class gets an equal length of ribbon, how long will each piece be? Write your answer a. Using only feet, b. Using a whole number of feet and a whole number of inches, and c. Using only inches 3. Wesley walked 11 miles in 4 hours. If he walked the same distance every hour, how far did he walk in one hour? Write your answer a. Using only hours, b. Using whole numbers of hours and a whole number of minutes, and c. Using only minutes Commentary: Note that in each of these problems we are given a set of specified size and a specified number of students into which it is to be divided. The questions ask the student to find out the size of each of the subsets.	To show evidence of meeting this standard, students will be able to solve multi-step problems where they use conversion to solve
Integrated Modifications: • One to one technology • Students work at own pace on lessons • Small group instruction (teachers pulls back if students need help) • Peer to peer help	
Content Area: Math Topic 12,	Topic 12: 9 days
Unit Title: Represent and Interpret Data	

Grade Level: 5th grade	
NJSLA Addressed: Represent and Interpret Data	
Topic 12 Summary	
Essential Questions: Why do we need to understand the various uses of grouping symbols in mathematical expressions?	Enduring Understandings: Using grouping symbols allows us to write mathematical expressions efficiently and interpret them correctly.
Learning Targets	
Students will be able to understand: Use parentheses, brackets, or braces in numerical expressions and evaluate expressions with these symbols. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product. - Sample Assessments - To show evidence of meeting this standard, students will: - Insert grouping symbols into expressions to make a given outcome (i.e. Insert grouping symbols into the following expression to make the answer 15. $12 + 3 \times 2 - 1$ - Generate numerical expressions from dictation (i.e. Write the following expressions numerically. (say out loud) “Four times the difference of 30 and 22”). - Generate numerical expressions from written sentences such as 3 times the sum of 16 and 4 - Recognize why outcomes change when grouping symbols are added to or taken away from an expression.	Students will be able to demonstrate: - Be given a specific quantity of manipulatives and directed to write an expression using grouping symbols to represent the total. - Need to be given extensive practice with multiple expressions that use grouping symbols throughout the year to develop understanding of when and how to use parentheses, brackets, and braces. First, students use these symbols with whole numbers. Then the symbols can be used as students add, subtract, multiply and divide decimals and fractions. - Be provided with the extensive practice of given equations that are not true due to the lack of grouping symbols. Students will place grouping symbols in the equations to make the equation true. - Need to be given practice in comparing expressions that are grouped differently. - Use their understanding of operations and grouping symbols to write expressions and interpret the meaning of a numerical expression. - Need extensive practice writing expressions for calculations given in words such as “divide 144 by 12, and then subtract $\frac{7}{8}$.” They write $(144 \div 12) - \frac{7}{8}$. - Recognize that $0.5 \times (300 \div 15)$ is $\frac{1}{2}$ of $(300 \div 15)$ without calculating the quotient.

• Evaluate numerical expressions using grouping symbols.	
Integrated Modifications: • One to one technology • Students work at own pace on lessons • Small group instruction (teachers pulls back if students need help) • Peer to peer help	
Content Area: Math Topic 13	Topic 13: 8 days
Unit Title: Algebra: Write and Interpret Numerical Expressions	
Grade Level: 5th grade	
NJSLs Addressed: 5.OA Operations and Algebraic Thinking/ Cluster: Write and Interpret numerical expression	

Topic 13 Summary

Essential Questions:

- Why do we need to understand the various uses of grouping symbols in mathematical expressions?

Enduring Understandings:

- Using grouping symbols allows us to write mathematical expressions efficiently and interpret them correctly.

Learning Targets

Students will be able to understand:

Use parentheses, brackets, or braces in numerical expressions and evaluate expressions with these symbols.

Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.

- Sample Assessments
- To show evidence of meeting this standard, students will:
- Insert grouping symbols into expressions to make a given outcome (i.e. Insert grouping symbols into the following expression to make the answer 15. $12 + 3 \times 2 - 1$
- Generate numerical expressions from dictation (i.e. Write the following expressions numerically. (say out loud) “Four times the difference of 30 and 22”).
- Generate numerical expressions from written sentences such as 3 times the sum of 16 and 4
- Recognize why outcomes change when grouping symbols are added to or taken away from an expression.
- Evaluate numerical expressions using grouping symbols.

Students will be able to demonstrate:

- Be given a specific quantity of manipulatives and directed to write an expression using grouping symbols to represent the total.
- Need to be given extensive practice with multiple expressions that use grouping symbols throughout the year to develop understanding of when and how to use parentheses, brackets, and braces. First, students use these symbols with whole numbers. Then the symbols can be used as students add, subtract, multiply and divide decimals and fractions.
- Be provided with the extensive practice of given equations that are not true due to the lack of grouping symbols. Students will place grouping symbols in the equations to make the equation true.
- Need to be given practice in comparing expressions that are grouped differently.
- Use their understanding of operations and grouping symbols to write expressions and interpret the meaning of a numerical expression.
- Need extensive practice writing expressions for calculations given in words such as “divide 144 by 12, and then subtract $\frac{7}{8}$.” They write $(144 \div 12) - \frac{7}{8}$.
- Recognize that $0.5 \times (300 \div 15)$ is $\frac{1}{2}$ of $(300 \div 15)$ without calculating the quotient.

Integrated Modifications: • One to one technology • Students work at own pace on lessons • Small group instruction (teachers pulls back if students need help) • Peer to peer help	
Content Area: Math Topic 14	Topic 14: 7 days
Unit Title: Graph points on the Coordinate Plane	
Grade Level: 5th grade	
NJSLA Addressed: 5.G Geometry: Cluster: Graph points on the coordinate plane to solve real-world problems	
Topic 14 Summary	
Essential Questions: • What is the coordinate system and how can you use it to solve problems?	Enduring Understandings: • The coordinate system consists of an origin, axes, and coordinates that are used to represent and interpret real world situations.
Learning Targets	
Students will be able to understand: Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersecting lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its	Students will be able to demonstrate: Instructional Guidance To assist in meeting this standard, students may: • Use the game of Battleship (see link below) to identify points on a coordinate plane

coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate). Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	• Use a map grid to identify the location of an object using ordered pairs • Using a coordinate graph, locate the x-coordinate and y-coordinate for a specific point Sample Assessments To show evidence of meeting this standard, students will: Benchmarks: By mid-year: • Identify the directionality of the x and y axes By the end of the year: • Locate points on a coordinate graph and place objects on a coordinate graph when given the coordinates
Integrated Modifications: • One to one technology • Students work at own pace on lessons • Small group instruction (teachers pulls back if students need help) • Peer to peer help	
Content Area: Math Topic 15	Topic 16: 7 days
Unit Title: Graph points on the Coordinate Plane/Algebra: Analyze Patterns and Relationships	
Grade Level: 5th grade	
NJSLS Addressed: Analyze Patterns and Relationships	

Topic 15 Summary

Essential Questions:

- Why do we look for patterns in a sequence?

Enduring Understandings:

- Patterns enable us to discover, analyze, describe, extend, and formulate concrete understandings of mathematical and real world phenomena.

Learning Targets

Students will be able to understand:

- Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

Sample Assessment

To show evidence of meeting this standard, students will:

- Generate two numerical patterns using two given rules.
- Identify apparent relationships between corresponding terms.
- Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

Students will be able to demonstrate:

- ➤ Use the rule “add 3” to write a sequence of numbers. Starting with a 0, students write 0,3,6,9,12,...
- Use the rule “add 6” to write a sequence of numbers. Starting with 0, students write 0,6,12,18,24,...
- After comparing these two sequences, the students notice that each term in the second sequence is twice the corresponding terms of the first sequence.
- May also use the distributive property to describe the relationship between the two numerical patterns by reasoning that $6+6+6=2(3+3+3)$.

0,+33,+36,+39,+312,...

0,+66,+612,+618,+624,...

- Once the students can describe that the second sequence of numbers is twice the corresponding terms of the first sequence, the terms can be written in ordered pairs and then graphed on a coordinate grid. They should recognize that each point on the graph represents two quantities in which the second quantity is twice the first quantity.

Ordered pairs

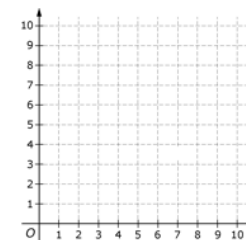
(0,0)

(3,6)

(6,12)

(9,18)

(12,24)



Integrated Modifications:

- One to one technology
- Students work at own pace on lessons
- Small group instruction (teachers pulls back if students need help)
- Peer to peer help

Content Area: Math Topic 16	Topic 16: 7 days
Unit Title: Geometry Measurement: Classify Two-Dimensional Figures	
Grade Level: 5th grade	
NJSLA Addressed: Classify two-dimensional figures into categories based on their properties.	
Topic 16 Summary	
Essential Questions: - How can two-dimensional figures be grouped by their properties? - Can a two-dimensional figure be classified in more than one category?	Enduring Understandings: A hierarchy of two-dimensional figures can be constructed to reflect the similarities and differences of these figures based on their properties.
Learning Targets	
Students will be able to understand: Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles. Classify two-dimensional figures in a hierarchy based on properties.	Students will be able to demonstrate: To assist in meeting this standard, students may: - Create various two-dimensional figures with toothpicks - Create a chart to identify different attributes of two-dimensional figures - Use geoboards to create two-dimensional figures when given clues about the figures. - Use Venn Diagrams to classify two-dimensional shapes based on their properties Sample Assessment To show evidence of meeting this standard, students will: - Identify and draw two-dimensional shapes - Classify two-dimensional shapes based on their properties

Integrated Modifications: • One to one technology • Students work at own pace on lessons • Small group instruction (teachers pulls back if students need help) • Peer to peer help	

Assessments

Benchmark:

- EnVision End of Unit Assessments

Formative:

Formative Assessment's goal is to monitor student learning to provide ongoing feedback that can be used by instructors to improve their teaching and by students to improve their learning.

- Drawing a concept map to represent understanding of a topic
- Classroom polls
- Exit tickets
- Turning in assignment for early feedback
- One minute papers

Summative:

Summative Assessments' goal is to evaluate students' learning at the end of an instructional unit by comparing it against some standard or benchmark.

- End of Unit or Chapter Test
- End of Course Assessment
- A final project or paper
- Standardized Test

Alternative Assessments:

- Teacher Observations
- Patterns
- Collage
- Paint By Number
- Crossword Puzzle
- Calendar

Interdisciplinary Connections:

- Language Arts, Art & Science

21st Century Skills & Career Education

(State 21st century themes here). Link <http://www.state.nj.us/education/cccs/2014/career/>

21st Century Life and Career Standards

21st Century Career Ready Practices

9.1.8.A.4 Relate earning power to quality of life across cultures.
9.1.8.A.5 Relate how the demand for certain skills determines an individual's earning power.
9.1.8.B.4 Relate the concept of deferred gratification to [investment,] meeting financial goals, and building wealth.
9.1.8.B.5 Explain the effect of the economy on personal income, individual and family security, and consumer decisions.
9.1.8.D.1 Determine how saving contributes to financial well-being.
9.1.8.E.1 Explain what it means to be a responsible consumer and the factors to consider when making consumer decisions.
9.1.8.E.2 Identify personal information that should not be disclosed to others and the possible consequences of doing or not doing so.
9.1.8.E.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career
9.1.8.E.4 Prioritize personal wants and needs when making purchases.
9.2.8.B.1 Research careers within the 16 Career Clusters® and determine attributes of career success.
9.2.8.B.2 Develop a Personalized Student Learning Plan with the assistance of an adult mentor that includes information about career areas of interest, goals and an educational plan.
9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, homework, and extracurricular activities for use in a career.
9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP3. Attend to personal health and financial well-being.
CRP4. Communicate clearly and effectively and with reason.
CRP5. Consider the environmental, social and economic impacts of decisions.
CRP6. Demonstrate creativity and innovation.
CRP 7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP 9. Model integrity, ethical leadership and effective management.
CRP10. Plan education and career paths aligned to personal goals.
CRP11. Use technology to enhance productivity.
CRP12. Work productively in teams while using cultural global competence.

Integration of Technology Standards

<https://www.state.nj.us/education/cccs/2014/tech/>

Content Area	Technology	
Standard	8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.	
Strand	A. Technology Operations and Concepts: <i>Students demonstrate a sound understanding of technology concepts, systems and operations.</i>	
Grade Level bands	Content Statement Students will:	Indicator
P	Understand and use technology systems.	8.1.P.A.1 Use an input device to select an item and navigate the screen
		8.1.P.A.2 Navigate the basic functions of a browser.
	Select and use applications effectively and productively.	8.1.P.A.3 Use digital devices to create stories with pictures, numbers, letters and words.
		8.1.P.A.4 Use basic technology terms in the proper context in conversation with peers and teachers (e.g., camera, tablet, Internet, mouse, keyboard, and printer).
		8.1.P.A.5 Demonstrate the ability to access and use resources on a computing device.
K-2	Understand and use technology systems.	8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.

	Select and use applications effectively and productively.	8.1.2.A.2 Create a document using a word processing application.
		8.1.2.A.3 Compare the common uses of at least two different digital applications and identify the advantages and disadvantages of using each.
		8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
		8.1.2.A.5 Enter information into a spreadsheet and sort the information.
		8.1.2.A.6 Identify the structure and components of a database.
		8.1.2.A.7 Enter information into a database or spreadsheet and filter the information.
3-5	Understand and use technology systems.	8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
	Select and use applications effectively and productively.	8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.
		8.1.5.A.3 Use a graphic organizer to organize information about problem or issue.
		8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.
		8.1.5.A.5 Create and use a database to answer basic questions.

		8.1.5.A.6 Export data from a database into a spreadsheet; analyze and produce a report that explains the analysis of the data.
6-8	Understand and use technology systems.	8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.
	Select and use applications effectively and productively.	8.1.8.A.2 Create a document (e.g. newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications to be critiqued by professionals for usability.
		8.1.8.A.3 Use and/or develop a simulation that provides an environment to solve a real world problem or theory.
		8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results
		8.1.8.A.5 Create a database query, sort and create a report and describe the process, and explain the report results.
Strand	B. Creativity and Innovation: <i>Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.</i>	
Grade Level bands	Content Statement Students will:	Indicator
P		8.1.P.B.1 Create a story about a picture taken by the student on a digital camera or mobile device.
K-2		8.1.2.B.1 Illustrate and communicate original ideas and stories using multiple digital tools and resources.
3-5		8.1.5.B.1 Collaborative to produce a digital story about a significant local event or issue based on first-

		person interviews.
6-8		8.1.8.B.1 Synthesize and publish information about a local or global issue or event (ex. telecollaborative project, blog, school web).
Strand	C. Communication and Collaboration: <i>Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.</i>	
Grade Level bands	Content Statement	Indicator
P	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.	8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities.
K-2	Communicate information and ideas to multiple audiences using a variety of media and formats.	8.1.2.C.1 Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.
3-5	Develop cultural understanding and global awareness by engaging with learners of other cultures.	8.1.5.C.1 Engage in online discussions with learners of other cultures to investigate a worldwide issue from multiple perspectives and sources, evaluate findings and present possible solutions, using digital tools and online resources for all steps.
6-8	Contribute to project teams to produce original works or solve problems.	8.1.8.C.1 Collaborate to develop and publish work that provides perspectives on a global problem for discussions with learners from other countries.
		8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.
Strand	D. Digital Citizenship: <i>Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.</i>	

Grade Level bands	Content Statement	Indicator
K-2	Advocate and practice safe, legal, and responsible use of information and technology.	8.1.2.D.1 Develop an understanding of ownership of print and nonprint information.
3-5	Advocate and practice safe, legal, and responsible use of information and technology.	8.1.5.D.1 Understand the need for and use of copyrights.
		8.1.5.D.2 Analyze the resource citations in online materials for proper use.
	Demonstrate personal responsibility for lifelong learning.	8.1.5.D.3 Demonstrate an understanding of the need to practice cyber safety, cyber security, and cyber ethics when using technologies and social media.
	Exhibit leadership for digital citizenship.	8.1.5.D.4 Understand digital citizenship and demonstrate an understanding of the personal consequences of inappropriate use of technology and social media.
6-8	Advocate and practice safe, legal, and responsible use of information and technology.	8.1.8.D.1 Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media.
	Demonstrate personal responsibility for lifelong learning.	8.1.8.D.2 Demonstrate the application of appropriate citations to digital content.
		8.1.8.D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property.
	Exhibit leadership for digital citizenship.	8.1.8.D.4 Assess the credibility and accuracy of digital content.
		8.1.8.D.5 Understand appropriate uses for social media and the negative consequences of misuse.

Strand	E: Research and Information Fluency: <i>Students apply digital tools to gather, evaluate, and use information.</i>	
Grade Level bands	Content Statement	Indicator
P	Plan strategies to guide inquiry.	8.1.P.E.1 Use the Internet to explore and investigate questions with a teacher's support.
K-2	Plan strategies to guide inquiry Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media. Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.	8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
3-5	Plan strategies to guide inquiry. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media. Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.	8.1.5.E.1 Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks.
6-8	Plan strategies to guide inquiry. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media. Evaluate and select information sources and digital tools based on the appropriateness for specific tasks. Process data and report results.	8.1.8.E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.
Strand	F: Critical thinking, problem solving, and decision making: <i>Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.</i>	
Grade Level Bands	Content Statement	Indicator
K-2	Identify and define authentic problems and significant questions for investigation. Plan and manage activities to develop a solution or complete a	8.1.2.F.1 Use geographic mapping tools to plan and solve problems

	project. Collect and analyze data to identify solutions and/or make informed decisions. Use multiple processes and diverse perspectives to explore alternative solutions.	
3-5	Identify and define authentic problems and significant questions for investigation. Plan and manage activities to develop a solution or complete a project. Collect and analyze data to identify solutions and/or make informed decisions. Use multiple processes and diverse perspectives to explore alternative solutions	8.1.5.F.1 Apply digital tools to collect, organize, and analyze data that support a scientific finding.
6-8	Identify and define authentic problems and significant questions for investigation. Plan and manage activities to develop a solution or complete a project. Collect and analyze data to identify solutions and/or make informed decisions. Use multiple processes and diverse perspectives to explore alternative	8.1.8.F.1 Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision.

Content Area	Technology
Standard	8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Strand	A. The Nature of Technology: Creativity and Innovation <i>Technology systems impact every aspect of the world in which we live.</i>

Grade Level bands	Content Statement	Indicator	Indicator
K-2	The characteristics and scope of technology.	8.2.2.A.1	Define products produced as a result of technology or of nature.
		8.2.2.A.2	Describe how designed products and systems are useful at school, home and work.
	The core concepts of technology.	8.2.2.A.3	Identify a system and the components that work together to accomplish its purpose.
		8.2.2.A.4	Choose a product to make and plan the tools and materials needed.
	The relationships among technologies and the connections between technology and other fields of study.	8.2.2.A.5	Collaborate to design a solution to a problem affecting the community.
3-5	The characteristics and scope of technology.	8.2.5.A.1	Compare and contrast how products made in nature differ from products that are human made in how they are produced and used.
		8.2.5.A.2	Investigate and present factors that influence the development and function of a product and a system.
	The core concepts of technology.	8.2.5.A.3	Investigate and present factors that influence the development and function of products and systems, e.g., resources, criteria and constraints.

	The relationships among technologies and the connections between technology and other fields of study.	8.2.5.A.4	Compare and contrast how technologies have changed over time due to human needs and economic, political and/or cultural influences.
		8.2.5.A.5	Identify how improvement in the understanding of materials science impacts technologies.
6-8	The characteristics and scope of technology.	8.2.8.A.1	Research a product that was designed for a specific demand and identify how the product has changed to meet new demands (i.e. telephone for communication - smart phone for mobility needs).
	The core concepts of technology.	8.2.8.A.2	Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system.
		8.2.8.A.3	Investigate a malfunction in any part of a system and identify its impacts.
	The relationships among technologies and the connections between technology and other fields of study.	8.2.8.A.4	Redesign an existing product that impacts the environment to lessen its impact(s) on the environment.
		8.2.8.A.5	Describe how resources such as material, energy, information, time, tools, people, and capital contribute to a technological product or system.
Content Area		Technology	

Standard		8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.	
Strand		B. Technology and Society: <i>Knowledge and understanding of human, cultural and societal values are fundamental when designing technological systems and products in the global society.</i>	
Grade Level bands	Content Statement Students will be able to understand:	Indicator	Indicator
K-2	The cultural, social, economic and political effects of technology.	8.2.2.B.1	Identify how technology impacts or improves life.
	The effects of technology on the environment.	8.2.2.B.2	Demonstrate how reusing a product affects the local and global environment.
	The role of society in the development and use of technology.	8.2.2.B.3	Identify products or systems that are designed to meet human needs.
	The influence of technology on history.	8.2.2.B.4	Identify how the ways people live and work has changed because of technology.

3-5	The cultural, social, economic and political effects of technology.	8.2.5.B.1	Examine ethical considerations in the development and production of a product through its life cycle.
	The effects of technology on the environment.	8.2.5.B.2	Examine systems used for recycling and recommend simplification of the systems and share with product developers.
		8.2.5.B.3	Investigate ways that various technologies are being developed and used to reduce improper use of resources.
	The role of society in the development and use of technology.	8.2.5.B.4	Research technologies that have changed due to society's changing needs and wants.
		8.2.5.B.5	Explain the purpose of intellectual property law.
	The influence of technology on history.	8.2.5.B.6	Compare and discuss how technologies have influenced history in the past century.
6-8	The cultural, social, economic and political effects of technology.	8.2.8.B.1	Evaluate the history and impact of sustainability on the development of a designed product or system over time and present results to peers.
		8.2.8.B.2	Identify the desired and undesired consequences from the use of a product or system.

	The effects of technology on the environment.	8.2.8.B.3	Research and analyze the ethical issues of a product or system on the environment and report findings for review by peers and /or experts.
		8.2.8.B.4	Research examples of how humans can devise technologies to reduce the negative consequences of other technologies and present your findings.
	The role of society in the development and use of technology.	8.2.8.B.5	Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries and societies.
		8.2.8.B.6	Compare and contrast the different types of intellectual property including copyrights, patents and trademarks.
	The influence of technology on history.	8.2.8.B.7	Analyze the historical impact of waste and demonstrate how a product is upcycled, reused or remanufactured into a new product.
Content Area		Technology	
Standard		8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.	
Strand		C. Design: <i>The design process is a systematic approach to solving problems.</i>	

Grade Level bands	Content Statement Students will be able to understand:	Indicator	Indicator
K-2	The attributes of design.	8.2.2.C.1	Brainstorm ideas on how to solve a problem or build a product.
		8.2.2.C.2	Create a drawing of a product or device that communicates its function to peers and discuss.
		8.2.2.C.3	Explain why we need to make new products.
	The application of engineering design.	8.2.2.C.4	Identify designed products and brainstorm how to improve one used in the classroom.
		8.2.2.C.5	Describe how the parts of a common toy or tool interact and work as part of a system.
	The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	8.2.2.C.6	Investigate a product that has stopped working and brainstorm ideas to correct the problem.
3-5	The attributes of design.	8.2.5.C.1	Collaborate with peers to illustrate components of a designed system.
		8.2.5.C.2	Explain how specifications and limitations can be used to direct a product's development.

		8.2.5.C.3	Research how design modifications have lead to new products.
	The application of engineering design.	8.2.5.C.4	Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models.
		8.2.5.C.5	Explain the functions of a system and subsystems.
	The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	8.2.5.C.6	Examine a malfunctioning tool and identify the process to troubleshoot and present options to repair the tool.
		8.2.5.C.7	Work with peers to redesign an existing product for a different purpose.
6-8	The attributes of design.	8.2.8.C.1	Explain how different teams/groups can contribute to the overall design of a product.
		8.2.8.C.2	Explain the need for optimization in a design process.
		8.2.8.C.3	Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.
		8.2.8.C.4	Identify the steps in the design process that would be used to solve a designated problem.

	The application of engineering design.	8.2.8.C.5	Explain the interdependence of a subsystem that operates as part of a system.
		8.2.8.C.5.a	Create a technical sketch of a product with materials and measurements labeled.
	The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	8.2.8.C.6	Collaborate to examine a malfunctioning system and identify the step-by-step process used to troubleshoot, evaluate and test options to repair the product, presenting the better solution.
		8.2.8.C.7	Collaborate with peers and experts in the field to research and develop a product using the design process, data analysis and trends, and maintain a design log with annotated sketches to record the developmental cycle.
		8.2.8.C.8	Develop a proposal for a chosen solution that includes models (physical, graphical or mathematical) to communicate the solution to peers.
Content Area		Technology	
Standard		8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.	
Strand		D. Abilities for a Technological World: <i>The designed world is the product of a design process that provides the means to convert resources into products and systems.</i>	
Grade Level bands	Content Statement Students will understand how to:	Indicator	Indicator

K-2	Apply the design process.	8.2.2.D.1	Collaborate and apply a design process to solve a simple problem from everyday experiences.
	Use and maintain technological products and systems.	8.2.2.D.2	Discover how a product works by taking it apart, sketching how parts fit, and putting it back together.
		8.2.2.D.3	Identify the strengths and weaknesses in a product or system.
		8.2.2.D.4	Identify the resources needed to create technological products or systems.
	Assess the impact of products and systems.	8.2.2.D.5	Identify how using a tool (such as a bucket or wagon) aids in reducing work.
3-5	Apply the design process.	8.2.5.D.1	Identify and collect information about a problem that can be solved by technology, generate ideas to solve the problem, and identify constraints and trade-offs to be considered.
		8.2.5.D.2	Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process to evaluate potential solutions.
	Use and maintain technological products and systems.	8.2.5.D.3	Follow step by step directions to assemble a product or solve a problem.
		8.2.5.D.4	Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.
		8.2.5.D.5	Describe how resources such as material, energy, information, time, tools, people and capital are used in products or systems.

	Assess the impact of products and systems.	8.2.5.D.6	Explain the positive and negative effect of products and systems on humans, other species and the environment, and when the product or system should be used.
		8.2.5.D.7	Explain the impact that resources such as energy and materials used in a process to produce products or system have on the environment.
6-8	Apply the design process.	8.2.8.D.1	Design and create a product that addresses a real world problem using a design process under specific constraints.
		8.2.8.D.2	Identify the design constraints and trade-offs involved in designing a prototype (e.g., how the prototype might fail and how it might be improved) by completing a design problem and reporting results in a multimedia presentation, design portfolio or engineering notebook.
		8.2.8.D.3	Build a prototype that meets a STEM-based design challenge using science, engineering, and math principles that validate a solution.
	Use and maintain technological products and systems.	8.2.8.D.4	Research and publish the steps for using and maintaining a product or system and incorporate diagrams or images throughout to enhance user comprehension.
	Assess the impact of products and systems.	8.2.8.D.5	Explain the impact of resource selection and the production process in the development of a common or technological product or system.
		8.2.8.D.6	Identify and explain how the resources and processes used in the production of a current technological product can be modified to have a more positive impact on the environment.

Content Area		Technology	
Standard		8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.	
Strand		E. Computational Thinking: Programming: <i>Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.</i>	
Grade Level bands	Content Statement Students will be able to understand:	Indicator	Indicator
K-2	Computational thinking and computer programming as tools used in design and engineering.	8.2.2.E.1	List and demonstrate the steps to an everyday task.
		8.2.2.E.2	Demonstrate an understanding of how a computer takes input through a series of written commands and then interprets and displays information as output.
		8.2.2.E.3	Create algorithms (a sets of instructions) using a predefined set of commands (e.g., to move a student or a character through a maze).
		8.2.2.E.4	Debug an algorithm (i.e., correct an error).

		8.2.2.E.5	Use appropriate terms in conversation (e.g., basic vocabulary words: input, output, the operating system, debug, and algorithm).
3-5	Computational thinking and computer programming as tools used in design and engineering.	8.2.5.E.1	Identify how computer programming impacts our everyday lives.
		8.2.5.E.2	Demonstrate an understanding of how a computer takes input of data, processes and stores the data through a series of commands, and outputs information.
		8.2.5.E.3	Using a simple, visual programming language, create a program using loops, events and procedures to generate specific output.
		8.2.5.E.4	Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing, software, coding, procedure, and data).
6-8	Computational thinking and computer programming as tools used in design and engineering.	8.2.8.E.1	Identify ways computers are used that have had an impact across the range of human activity and within different careers where they are used.
		8.2.8.E.2	Demonstrate an understanding of the relationship between hardware and software.
		8.2.8.E.3	Develop an algorithm to solve an assigned problem using a specified set of commands and use peer review to critique the solution.
		8.2.8.E.4	Use appropriate terms in conversation (e.g., programming, language, data, RAM, ROM, Boolean logic terms).

Accommodations and Modifications for students who are classified as Gifted and Talented Students:

(This course of instruction shall be modified through varying techniques, strategies, materials, etc. to meet the needs of all students, including, but not limited to, special education, E.L.L. and basic skills. Programs shall be modified based on I.E.P.'s, 504's, etc.)

Differentiation Strategies

Differentiation strategies can require varied amounts of preparation time. High-prep strategies often require a teacher to both create multiple pathways to process information/demonstrate learning and to assign students to those pathways. Hence, more ongoing monitoring and assessment is often required. In contrast, low-prep strategies might require a teacher to strategically create process and product choices for students, but students are allowed to choose which option to pursue given their learning profile or readiness level.

Low Prep Strategies

Varied journal prompts, spelling or vocabulary lists	Students are given a choice of different journal prompts, spelling lists or vocabulary lists depending on level of proficiency/assessment results.
Anchor activities	Anchor activities provide meaningful options for students when they are not actively engaged in classroom activities (e.g., when they finish early, are waiting for further directions, are stumped, first enter class, or when the teacher is working with other students). Anchors should be directly related to the current learning goals.
Choices of books	Different textbooks or novels (often at different levels) that students are allowed to choose from for content study or for literature circles.
Choices of review activities	Different review or extension activities are made available to students during a specific section of the class (such as at the beginning or end of the period).

Flexible grouping	Students might be instructed as a whole group, in small groups of various permutations (homogeneous or heterogeneous by skill or interest), in pairs or individual. Any small groups or pairs change over time based on assessment data.
Multiple Intelligence or Learning Style options	Students select activities or are assigned an activity that is designed for learning a specific area of content through their strong intelligence (verbal-linguistic, interpersonal, musical, etc.)
Varying scaffolding of same organizer	Provide graphic organizers that require students to complete various amounts of information.
Think-Pair-Share by readiness, interest, and/or learning profile	Students are placed in predetermined pairs, asked to think about a question for a specific amount of time, then are asked to share their answers first with their partner and then with the whole group.
Mini workshops to re-teach or extend skills	A short, specific lesson with a student or group of students that focuses on one area of interest or reinforcement of a specific skill.
Games to practice mastery of information and skill	Use games as a way to review and reinforce concepts. Include questions and tasks that are on a variety of cognitive levels.
Multiple levels of questions	Teachers vary the sorts of questions posed to different students based on their ability to handle them. Varying questions is an excellent way to build the confidence (and motivation) of students who are reluctant to contribute to class discourse.
High Prep Strategies (add to list as needed)	
Cubing	Designed to help students think about a topic or idea from many different angles or perspectives. The tasks are placed on the six sides of a cube and use commands that help support thinking (justify, describe, evaluate, connect, etc.). The students complete the task on the side that ends face up, either independently or in homogenous groups.
Tiered assignment/ product	The content and objective are the same, but the process and/or the products that students must create to demonstrate mastery are varied according to the students' readiness level.
Independent studies	Students choose a topic of interest that they are curious about and wants to discover new information on. Research is done from questions developed by the student and/or teacher. The researcher produces a product to share learning with classmates.
Jigsaw	Students are grouped based on their reading proficiency and each group is given an appropriate text on a specific aspect of a topic (the economic, political and social impact of the Civil War, for example). Students later get into heterogeneous groups to share their findings with their peers, who have read about different areas of study from source texts on their own reading levels. The jigsaw technique allows you to tackle the same subject with all of your students while discreetly providing them the different tools they need

	to get there.
Multiple texts	The teacher obtains or creates a variety of texts at different reading levels to assign strategically to students.
Alternative assessments	After completing a learning experience via the same content or process, the student may have a choice of products to show what has been learned. This differentiation creates possibilities for students who excel in different modalities over others (verbal versus visual).
Modified Assessments	Assessments can be modified in a variety of ways – for example by formatting the document differently (e.g. more space between questions) or by using different types of questions (matching vs. open ended) or by asking only the truly essential questions.
Literature circles	Flexible grouping of students who engage in different studies of a piece of literature. Groups can be heterogeneous and homogeneous.
Learning Centers	A station (or simply a collection of materials) that students might use independently to explore topics or practice skills. Centers allow individuals or groups of students to work at their own pace. Students are constantly reassessed to determine which centers are appropriate for students at a particular time, and to plan activities at those centers to build the most pressing skills.
Tic-Tac-Toe Choice Board	The tic-tac-toe choice board is a strategy that enables students to choose multiple tasks to practice a skill, or demonstrate and extend understanding of a process or concept. From the board, students choose (or teacher assigns) three adjacent or diagonal. To design a tic-tac-toe board: - Identify the outcomes and instructional focus - Design 9 different tasks - Use assessment data to determine student levels - Arrange the tasks on a tic-tac-toe board either randomly, in rows according to level of difficulty, or you may want to select one critical task to place in the center of the board for all students to complete.
Gifted and Talented: The regulations require that district boards of education provide appropriate K-12 services for gifted and talented students. This includes appropriate curricular and instructional modifications for gifted and talented students indicating content, process, products, and learning environment. District boards of education must also take into consideration the <i>PreK-Grade 12 National Gifted Program Standards</i> of the National Association for Gifted Children in developing programs for gifted and talented students. A copy of those standards is available at www.nagc.org. In addition, information can be found at www.state.nj.us/education/aps/ccs/gandt.	

Accommodations and Modifications for students who are classified as E.L.L Students:

(This course of instruction shall be modified through varying techniques, strategies, materials, etc. to meet the needs of all students, including, but not limited to, special education, E.L.L. and basic skills. Programs shall be modified based on I.E.P.'s, 504's, etc.)

Classroom Modifications for E.L.L.

PACING:

- Extend time requirements
- Omit assignments

PRESENTATION OF SUBJECT MATERIAL:

- Use individual/small group instruction
- Use specialized curriculum
- Simplify language
- Tape lectures for playback
- Demonstrate concepts
- Use manipulatives
- Emphasize critical information
- Use graphic organizers
- Pre-teach vocabulary

ENVIRONMENT:

- Assign preferential seating
- Assign peer buddy

MATERIALS:

- Provide taped textbooks
- Highlight textbooks/study guides
- Use supplementary materials
- Give assistance in note taking
- Type handwritten teacher materials
- Use bilingual dictionaries, language learner dictionaries and electronic translators
- Use adapted/modified textbooks Allow use of computer/word processor

REINFORCEMENT AND FOLLOW THROUGH:

- Use positive reinforcement
- Use concrete reinforcement
- Check often for understanding/review
- Arrange for peer tutoring

TESTING ADAPTATIONS;

- Allow students to answer orally
- Use multiple-choice format
- Read test to student
- Modify format

● Plan cooperative learning experiences ● Provide language experience ● Give immediate feedback ● Have student repeat directions ● Make/use vocabulary files ● Teach study skills ● Use study guides to organize materials ● Repeat/review/drill	● Write a different test ● Shorten test length ● Require only selected test items ● Create alternative assessment
ASSIGNMENTS: ● Lower reading level ● Give directions in small, distinct steps ● Allow copying from paper/book ● Use written backup for oral directions ● Lower difficulty level ● Shorten assignment ● Read directions to students ● Give oral clues or prompts ● Record or type assignments ● Adapt worksheets, packets Use alternate assignments	GRADING: ● Modify grading system ● Modify weights of course components ● Modify course objectives/outcome

Classroom Accommodations for E.L.L	
Environment: ● Preferential Seating ● Assign peer tutor ● Visual charts/cues ● Provide tape recorded discourse ● Highlight key words ● Use real objects/manipulatives ● Refer to prior knowledge (K-W-L or other) ● Provide quiet study space	Assignment: ● Adjust reading level materials ● Single step directions ● Provide extra examples/models ● Shorten assignment/task ● Directions read aloud ● Adapt/simplify language on task ● Give oral prompts/cues ● Allow projects to replace written tasks
Presentation: ● Individual/small group discussions ● Use specialized curriculum/equipment ● Simplify language/key word	Materials: ● Provide tape recorded text ● Provide supplementary materials ● Highlighted text

• Demonstrations for key concepts • Visual or Multi-modal presentations • Frequently check for understanding • Use manipulatives • Native Language presentations	• Bilingual dictionaries/glossaries • Use of graphic organizers • Pre-teach all vocabulary • Provide varied visual/multi-sensory input • Native Language Text
Management: • Allow oral responses • Use positive reinforcement • Repeat all directions • Use cooperative learning groups • Use projects/interdisciplinary tasks • Provide language experience tasks • Have student repeat directions • Immediate praise/feedback • Plan peer tutors/models • Provide high interest topics/options • Provide extended time to complete tasks • Allow student to think/speak in native language	Class Assessment: • Allow oral responses • Read test aloud • Read portions/key words on test • Modify format/length of test • Alternate with culturally non-biased items • Provide glossaries in native language • Modify test items/weighted scores • Use multiple choice format

Accommodations for English Language Learners General Classroom and Content Areas

MATH:

- At beginning to intermediate levels of proficiency, English Language Learners should be shown examples of a completed assignment to model the correct format.
- Assignments and directions should be printed on the board along with cursive representation.
- A bilingual assistant/interpreter, when available, could be used to explain math concepts in the student's primary language.
- Students should have access to counters, number lines and other types of manipulatives, which enable them to complete assignments at their level of instruction.
- Rewrite story problems in simpler English. Use short sentences, pictures, and illustrations to encourage understanding.
- Show students how to prepare a card file of number words. Write the word on one side and the symbol on the opposite side.

SOCIAL STUDIES

- Allow beginning and advanced beginning students to use drawings to demonstrate knowledge of concepts.
- Show English Language Learners at all proficiency levels a model of a project/assignment prior to their completing the assignment.
- Teach the key concepts while limiting the vocabulary and details in the lesson.
- Test only those key concepts addressed.
- Use many visual aids during the instruction process; i.e. overhead transparencies, maps, graphic organizers, puzzles, computer, etc.

- Tape record the test or give test orally to student.
- Allow ELL student capable of tape-recording lessons to do so. (Provides immediate feedback for student to listen to the lesson at home and work on assignments on his/her own.)

READING

When making accommodations for ELL students in the area of reading, it is important to remember that there is a difference between listening and speaking and reading and writing. Some English Language Learners might be considered advanced in speaking, but functioning at a beginning instructional level when it comes to reading with fluency. Keep this in mind when assigning grades. Try to remember to place the emphasis on the student's instructional level in Reading.

- ELL students at all proficiency levels should have reading materials provided at their instructional level by the classroom teacher.
- ELL students should be taught vocabulary in context; remember to limit the number of vocabulary words taught in each unit to only the key words. As comprehension increases, increase number of words.
- Tape record information for the ELL student to learn and let him/her listen to it.
- Let students act out the story to demonstrate understanding.
- Use a variety of strategies and approaches to teach reading. The key component is to make sure that students are being taught vocabulary through meaningful context, not in isolation.
- Provide the ELL student the background knowledge necessary in order to understand.
- Teach ELL students reading strategies that enable them to predict, connect, question, and visualize a story.

SCIENCE

- Homework should include completing graphs, drawing, writing in journal, etc.
- Students should work in groups when possible to solve problems or conduct experiments.
- Provide many hands-on experiences as ELL students learn best by doing and seeing lessons.
- Show ELL students at all proficiency levels a sample of a completed project or assignment when requiring a science project for a grade.
- Have students compile notebooks of their hypotheses, materials, procedures, data, conclusions of experiments, and field experiences.
- Have students prepare collections of science objects, such as sticks and leaves.
- Use "hands-on" experiential activities that do not rely on academic language for understanding
- Prepare large charts that summarize the steps involved in experiments.

WRITING

When making accommodations for English language learners in the area of writing, the same principle holds true. There is a large difference between listening and speaking and reading and writing. Many ELL students could be considered advanced in speaking but at a beginning instructional level in writing.

- ELL students may not know what cursive writing is; therefore, it will have to be taught.
- ELL students could be provided a list of basic sentence patterns or words (with pictures) most frequently used in their classrooms for use when writing independently.
- ELL students could use a journal as a means of practicing writing with teacher feedback.
- Classroom teacher could provide a model of what he/she expects the finishing writing assignment to look like.
- Allow ELL students to write about topics in which they have background knowledge.
- Allow ELL students to work together when possible to brainstorm and to begin the writing process.
- Use vocabulary words and sentence structures at the instructional level of the student. Use words from their own materials. The words must have meaning for the student. Provide context clues when helping the child to learn new material.
- Try to limit the number of spelling words assigned. Increase the number of words as comprehension level increases.
- Usually ELL student's oral language skills tend to be higher than their reading and writing skills. Adjust assignments based on the instructional level of the

student.

Accommodations and Modifications for students who are classified with 504's:

Examples of General Accommodations:

General program accommodations/adjustments or services are always made on a case-by-case basis and individualized. Accommodations are to be reasonable and are intended to provide persons with disabilities compensation for their functional limitation(s) due to a mental or physical impairment. Where Section 504 is concerned, accommodations are made to bring a student with a disability to the same starting point as a non-disabled student. Consequently, the accommodations defined in a Section 504 plan are those interventions that are not typically available to all students.

Environmental Strategies

- Provide a structured learning environment
- Make separate "space" for different types of tasks
- Possible adapting of non-academic times such as lunch, recess, and physical education
- Change student seating
- Utilize a study carrel
- Alter location or personal or classroom supplies for easier access or to minimize distraction
- Provide sensory breaks
- Provide a written or picture schedule

Organizational Strategies

- Model and reinforce organizational systems (i.e. color-coding)
- Write out homework assignments, check student's recording of assignments
- Tailor homework assignments toward student strengths
- Set time expectations for assignments
- Provide clues such as clock faces indicating beginning and ending times
- Teach study/organizational skills
- Schedule before or after school tutoring/homework assistance

Behavioral Strategies

- Use behavioral management techniques consistently within a classroom and across classes
- Implement behavioral/academic contracts
- Utilize positive verbal and/or nonverbal reinforcements
- Utilize logical consequences
- Confer with the student's parents (and student as appropriate)

- Establish a home/school communication system for behavior monitoring
- Post rules and consequences for classroom behavior
- Put student on daily/weekly progress report/contract
- Reinforce self-monitoring and self-recording of behaviors

Presentation Strategies

- Tape lessons so the student can listen to them again; allow students to tape lessons
- Use computer-aided instruction and other audiovisual equipment
- Select alternative textbooks, workbooks, or provide books on tape
- Highlight main ideas and supporting details in the book
- Provide copied material for extra practice (i.e. outlines, study guides)
- Prioritize drill and practice activities for relevance
- Vary the method of lesson presentation using multi-sensory techniques:
 - a) lecture plus overhead/board demonstration support
 - b) small groups required to produce a written product
 - c) large groups required to demonstrate a process
 - d) computer-assisted instruction
 - e) peer tutors or cross-age tutors
 - f) demonstrations, simulations
 - g) experiments
 - h) games
- Ask student to repeat/paraphrase context to check understanding
- Arrange for a mentor to work with student in his or her interest area or area of greatest strength
- Provide peer tutoring
- Simplify and repeat instructions about in-class and homework assignments
- Vary instructional pace
- Reinforce the use of compensatory strategies, i.e. pencil grip, mnemonic devices, “spell check”
- Vary kind of instructional materials used
- Assess whether student has the necessary prerequisite skills. Determine whether materials are appropriate to the student's current functioning levels
- Reinforce study skill strategies (survey, read, recite, review)
- Introduce definition of new terms/vocabulary and review to check for understanding
- Be aware of student's preferred learning style and provide matching instruction materials
- Pre-teach and/or re-teach important concepts • Prepare advanced organizers/study guides for new material

Assignments

- Modify the amount of homework
- Use written directions to supplement oral directions
- Reduce paper and pencil tasks
- Allow for assignments to be word processed

- Lower reading level of assignments
- Break assignments into a series of smaller assignments
- Use highlighted texts

Evaluation Methods

- Limit amount of material presented on a single page
- Provide a sample or practice test
- Provide for oral testing
- Provide tests in segments so that student hands in one segment before receiving the next part
- Provide personal copy of test tools and allow for color-coding/highlighting
- Adjust time for completion
- Modify weights of tests when grading

Accommodations and Modifications for students who are classified with IEP's:

(This course of instruction shall be modified through varying techniques, strategies, materials, etc. to meet the needs of all students, including, but not limited to, special education, E.S.L. and basic skills. Programs shall be modified based on I.E.P.'s, 504's, etc.)

A. Setting Accommodations

1. Administering the assessment:
 - a. individually in a separate room
 - b. in a small group in a separate room
 - c. in the resource room
 - d. in a special education classroom
 - e. at home or in a hospital (this will depend on the nature of the assessment task)
2. Seating the student in the front of the room near the examiner or proctor
3. Seating the student facing the examiner or proctor
4. Providing special lighting
5. Providing special furniture e.g., desks, trays, carrels

B. Scheduling Accommodations

1. Adding time as needed
2. Providing frequent breaks
3. Terminating a section of the test when a student has indicated that he/she has completed all the items he/she can. The examiner must ensure that the student has attempted all items in a section since items are not ordered by difficulty. When this accommodation is used, the test must be administered in a small group or individually to avoid distraction.

C. Test Materials Modifications

1. Administering the large-print version of the test
2. Administering the Braille version of the test

D. Test Procedure Modifications

1. Administration modifications
 - a. reading directions aloud
 - b. reading test items aloud (do not read aloud or sign the reading passages in Language Arts Literacy –the reading items may be read or signed); ONLY the teacher who must read the test items aloud or sign is permitted to have a test booklet assigned to him/her for this task
 - c. providing and ensuring that amplification (hearing aid and/or FM system) is in working order
 - d. using a sign language or cued speech interpreter to sign or cue the directions or test items but NOT the reading passages
 - e. masking a portion of the test booklet and/or answer folder to eliminate visual distractors or providing reading windows

- f. repeating, clarifying, or rewording directions ONLY
- g. providing written directions on a separate sheet or transparency
- h. using an examiner who is familiar with the student
- i. using an examiner who can communicate fluently in sign language (American Sign Language or a form of Manually Coded English)
- j. providing manipulatives for math items e.g., number line, counting chips, abacus (for NJ ASK 3-8 ONLY)
- k. using graph paper for HSPA Mathematics (all students are permitted graph paper for NJ ASK 3-8)
- l. using a Braille ruler and talking calculator or large-face calculator
- m. using tactile or visual cues for deaf or hard of hearing students to indicate time to begin, time remaining, and time to end a particular part of the test
- n. using calculators for NJ ASK 3-8 Mathematics (all students are permitted calculators for HSPA)

2. Response modifications

- a. having an examiner record the student's identification information on the test booklet and/or answer folder
- b. dictating oral responses to a scribe (examiner or proctor who writes from dictation)
- c. using a Braille writer to record responses
- d. signing responses to a sign language interpreter (student must indicate all punctuation and must spell all keywords)
- e. recording responses on a word processor (all editorial functions MUST be disabled)
- f. providing an augmentative communication device
- g. using a larger diameter or modified special grip # 2 pencil
- h. circling answers in the test booklet (the examiner subsequently transfer the answers to the answer folder); for the NJ ASK 3-4, the examiner bubbles the student's answer choice in the scannable test booklet
- i. allowing separate additional continuation pages for writing tasks

OTHER CONSIDERATIONS

Ensure that:

1. any medication has been appropriately adjusted so it will not interfere with the student's functioning.
2. eyeglasses are used, if needed.
3. hearing aids, FM systems, augmentative communication devices, word processors, or other types of equipment are functioning properly.
4. source and strength of light are appropriate.
5. all students can clearly see and hear the examiner.
6. all deaf or hard of hearing students who communicate aurally/orally are watching the examiner when instructions are given.

Gifted and Talented: The regulations require that district boards of education provide appropriate K-12 services for gifted and talented students. This includes appropriate curricular and instructional modifications for gifted and talented students indicating content, process, products, and learning environment. District boards of education must also take into consideration the *PreK-Grade 12 National Gifted Program Standards* of the National Association for Gifted Children in developing programs for gifted and talented students. A copy of those standards is available at www.nagc.org. In addition, information can be found at www.state.nj.us/education/aps/ccs/gandt.

Accommodations and Modifications for students at risk of failing:

Students thought to be at risk for failing will be given interventions in the classroom by the teacher and support staff. Data on these interventions will be tracked and if sufficient progress is not demonstrated, that student will be referred to the I&RS team. The I&RS team will compile all existing data and create targeted and individual interventions with the help of area specialists. These interventions may include some of the following:

- Provide visual and verbal directions
- Simplify directions into one-step
- Check back after two steps have been completed
- Model self-talk to complete tasks
- Discuss organizational plans for work and work completion
- Allow for multiple methods of demonstrating learning and competence
- Enforce opportunities to correct work
- Provide 1:1 instructional time
- Provide physical manipulatives whenever possible
- Assess and provide optimal seating arrangement