



## Curriculum

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Math  
Grade 4th

**Estell Manor School District**

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**Board of Education**

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**Acknowledgments:**

The following individuals are acknowledged for their assistance in the preparation of this curriculum:  
Mrs. Elaine Baker

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## 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 21<sup>st</sup> century skills, integration of technology, and integration of 21<sup>st</sup> 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: 4th grade**

**Pacing Guide**

| <b>Course Title: Math</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                     | <b>Grade level: 4th Grade</b> |                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------|
| <b>Topic</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Unit of Study</b>                                                | <b>Topic</b>                  | <b>Unit of Study</b>                                                               |
| <b>1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Generalize Place Value Understanding</b>                         | <b>9</b>                      | <b>Understand Addition and Subtraction of Fractions</b>                            |
| <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Fluently Add and Subtract Multi-Digit Whole Numbers</b>          | <b>10</b>                     | <b>Extend Multiplication Concepts to Fractions</b>                                 |
| <b>3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Use Strategies and Properties to Multiply by 1-Digit Numbers</b> | <b>11</b>                     | <b>Represent and Interpret Data on Lines Plots</b>                                 |
| <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Use Strategies and Properties to Multiply by 2-Digit Numbers</b> | <b>12</b>                     | <b>Understand and Compare Decimals</b>                                             |
| <b>5</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Use Strategies and Properties to Divide by 1-Digit Numbers</b>   | <b>13</b>                     | <b>Measurement: Find Equivalence in Units of Measure</b>                           |
| <b>6</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Use Operations with Whole Numbers to Solve Problems</b>          | <b>14</b>                     | <b>Algebra: Generate and Analyze Patterns</b>                                      |
| <b>7</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Factors and Multiples</b>                                        | <b>15</b>                     | <b>Geometric Measurement: Understand Concepts of Angles and Angle Measurements</b> |
| <b>8</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Extend Understanding of Fraction Equivalence and Ordering</b>    | <b>16</b>                     | <b>Lines, Angles, and Shapes</b>                                                   |
| <p style="text-align: center;"><b>Instruction Materials/Additional Resources:</b><br/> <b>Math K-4/EnVision 2.0 Math/Scott Foresman/2020, <a href="http://www.pearsonsuccessnet.com">www.pearsonsuccessnet.com</a></b><br/> <b>Classroom Manipulatives, EDC Calendar Math activities, GregTangMath.com, <a href="http://www.mathgoodies.com">http://www.mathgoodies.com</a>, <a href="http://www.funbrain.com">http://www.funbrain.com</a>,</b><br/> <b><a href="http://www.mathplayground.com">http://www.mathplayground.com</a>, <a href="http://www.mathsisfun.com">http://www.mathsisfun.com</a>, <a href="http://www.gamequarium.com">http://www.gamequarium.com</a>, <a href="http://www.vestorkids.com">http://www.vestorkids.com</a>, <a href="http://www.mathwire.com">http://www.mathwire.com</a>,</b></p> |                                                                     |                               |                                                                                    |

<http://go-el.com>, <http://edmentum.com>

Estell Manor School  
4th grade Math Curriculum  
Overview

**Content Area: Math Topic 1**

Topic 1=7 Days

Unit Title: Generalize Place Value Understanding

Grade Level: 4th grade

CCSS Addressed: 4.NBT.A.1, 4.NBT.A.2, 4.NBT.A.3

- 4.NBT.A.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that  $700 \div 70 = 10$  by applying concepts of place value and division.*
- 4.NBT.A.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using  $>$ ,  $=$ , and  $<$  symbols to record the results of comparisons.
- 4.NBT.A.3 Use place value understanding to round multi-digit whole numbers to any place.

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| Topic 1 Summary                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p>Essential Questions:</p> <ul style="list-style-type: none"> <li>• How are greater numbers written?</li> <li>• How can whole numbers be compared?</li> <li>• How are place values related?</li> </ul>                                                                                                                 | <p>Enduring Understandings:</p> <ul style="list-style-type: none"> <li>• Our number system is based on groups of ten. Whenever we get 10 in one place value, we move to the next greater place value.</li> <li>• In a multi-digit whole number, a digit in one place represents ten times what it would represent in the place immediately to its right</li> <li>• Place value can be used to compare numbers</li> <li>• Rounding whole numbers is a process for finding the multiple of 10, 100 and so on closest to a given number.</li> <li>• Good math thinkers use math to explain why they are right. They can talk about math that others do, too.</li> </ul> |
| Learning Targets                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p>Students will be able to understand:</p> <ul style="list-style-type: none"> <li>• 1.1 Numbers Through One Million</li> <li>• 1.2 Place Value Relationships</li> <li>• 1.3 Compare Whole Numbers</li> <li>• 1.4 Round Whole Numbers</li> <li>• 1.5 Math Practices and Problem Solving: Construct Arguments</li> </ul> | <p>Students will be able to demonstrate:</p> <ul style="list-style-type: none"> <li>• Read and write numbers in expanded form, with numerals, and using number names.</li> <li>• Recognize the relationship between adjacent digits in a multi-digit number.</li> <li>• Use place value to compare multi-digit numbers.</li> </ul>                                                                                                                                                                                                                                                                                                                                   |
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| Content Area: Math Topics 2                                                                                                                                                                                                                                                                                             | Topic 2: 14 days                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Unit Title: Fluently Add and Subtract Multi-Digit Whole Numbers                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Grade Level: 4th                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

CCSS Addressed: 4.NBT.B.4

- 4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

## Topic 2 Summary

### Essential Questions:

- How can sums and differences of whole numbers be estimated?
- What are standard procedures for adding and subtracting whole numbers?

### Enduring Understandings:

- Representing numbers and numerical expressions in equivalent forms can make some calculations easy to do mentally. There is more than one way to do a mental calculation.
- There is more than one way to estimate a sum or difference. Estimation gives a way to replace numbers with other numbers that are close and easier to compute with mentally.
- The standard addition algorithm for multi-digit numbers breaks the calculation into simpler calculations using place value.
- The standard addition and subtraction algorithms for multi-digit numbers break the calculation into simpler calculations using place value starting with the ones, then the tens, and so on.
- Good math thinkers know how to think about words and numbers to solve problems.

## Learning Targets

### Students will be able to understand:

- 2.1 Mental Math: Find Sums and Differences
- 2.2 Mental Math: Estimate Sums and Differences
- 2.3 Add Whole Numbers
- 2.4 Subtract Whole Numbers
- 2.5 Subtract Across Zeros
- 2.6 Math Practices and Problem Solving: Reasoning

### Students will be able to demonstrate:

- Add and subtract whole numbers mentally using a variety of methods.
- Round greater whole numbers to estimate sums and differences.
- Use place value and an algorithm to subtract whole numbers.
- Use number sense and regrouping to subtract across zeros.
- Use previously learned concepts and skills to reason abstractly and make sense of quantities and their relationships in problem situations.

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| <b>Content Area: Math Topic 3</b>                                                                                                                                                                                                                                                                                                                                                                                                                         | Topic 3 = 10 days/ |
| Unit Title: Use Strategies and Properties to Multiply by 1-Digit Numbers                                                                                                                                                                                                                                                                                                                                                                                  |                    |
| Grade Level: 4th                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |
| CCSS Addressed: 4.NBT.B.4, 4.NBT.B.5                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |
| <ul style="list-style-type: none"> <li>4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.</li> <li>4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</li> </ul> |                    |

### Topic 3 Summary

#### Essential Questions:

- How can you multiply by multiples of 10, 100, 1,000?
- How can you estimate when you multiply?

#### Enduring Understandings:

- Basic Facts and place-value patterns can be used to find products when one factor is 10, 100, or 1,000.
- Rounding is one way to estimate products.
- The properties of multiplication can be used to simplify computation and to verify mental math and paper and pencil algorithm.
- Properties of multiplication and place-value understanding can be used to multiply without paper and pencil.
- The expanded algorithm for multiplication can be represented with arrays. In the algorithm, numbers are broken apart using place value, and the parts are used to find partial products.
- The expanded algorithm for multiplication breaks numbers apart using place value, and the parts are used to find partial products. The partial products are then added together to find the product.
- The standard multiplication algorithm is a shortcut for the expanded algorithm. Regrouping is used rather than showing all partial products.
- The standard algorithm for multiplication involves breaking apart numbers using place value, finding partial products, and then adding partial products to get the final product. The Process is the same regardless of the size of the factors.

### Learning Targets

#### Students will be able to understand:

- 3.1 Mental Math: Multiply by Multiples of 10, 100 and 1,000
- 3.2 Mental Math: Round to Estimate Products
- 3.3 The Distributive Property
- 3.4 Mental Math Strategies for Multiplication
- 3.5 Arrays and Partial Products
- 3.6 Use Partial Products to Multiply by 1-Digit Numbers
- 3.7 Multiply 2-Digit and 3-Digit Numbers by 1-Digit Numbers
- 3.8 Multiply 4-Digit by 1-Digit Numbers
- 3.9 Multiply by 1-Digit Numbers
- 3.10 Math Practices and Problem Solving: Model with Math

#### Students will be able to demonstrate:

- Multiply multiples of 10, 100, and 1,000 using mental math and place value strategies.
- Use rounding to estimate products and check if answers are reasonable.
- Use the Distributive Property to multiply larger numbers.
- Use place value and properties of operations to multiply mentally.
- Use arrays and partial products to multiply 3- and 4- digit numbers by 1-digit
- Use place value and the standard algorithm to multiply 2- and 3- digit numbers by 1-digit numbers.
- Use the standard algorithm to multiply 4-digit numbers by 1-digit numbers.
- Use the standard algorithm to multiply 4-digit numbers by 1-digit numbers. Estimate to check if answers are reasonable.
- Use previously learned concepts and skills to represent and solve problems.

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| <b>Content Area: Math Topic 4</b>                                                                                                                                                                                                                                                                                                                  | Topic 4 = 13 days |
| Unit Title: Use Strategies and Properties to Multiply by 2 Digit numbers                                                                                                                                                                                                                                                                           |                   |
| Grade Level: 4th                                                                                                                                                                                                                                                                                                                                   |                   |
| CCSS Addressed: 4.NBT.B.5                                                                                                                                                                                                                                                                                                                          |                   |
| <ul style="list-style-type: none"><li>4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</li></ul> |                   |

## Topic 4 Summary

### Essential Questions:

- How can you use a model to multiply?
- How can you use the Distributive Property to multiply?
- How can you use multiplication to solve problems?

### Enduring Understandings:

- Basic facts and place-value patterns can be used to mentally multiply a 2-digit number by a multiple of ten.
- Place-value blocks, area models, arrays provide ways to visualize and find products.
- Products of 2-digit by 2-digit multiplication problems can be estimated by replacing each factor with the closest multiple of ten.
- Products can be estimated by replacing factors with other numbers that are close and easy to multiply mentally.
- The expanded algorithm for multiplying with 2-digit numbers is an extension of the expanded algorithm for multiplying with 1-digit numbers.
- The Distributive Property can be used to multiply two 2-digit numbers by breaking the computation down into 4 simpler products and adding the partial products together.
- The expanded algorithm for multiplication can be represented with arrays. In the algorithm, numbers are broken apart using place value, and the parts are used to find partial products.
- The standard algorithm for multiplying a 2-digit number by a multiple of 10 is an extension of the algorithm for multiplying multi-digit numbers by a 1-digit number.
- The standard multiplication algorithm involves breaking the calculation into simpler ones using place value and properties of operations. Regrouping is used rather than showing all partial products.
- Good math thinkers make sense of problems and think of ways to solve them. If they get stuck they don't give up.

## Learning Targets

Students will be able to understand:

- 4.1 Mental Math: Multiply Multiples of 10
- 4.2 Use Models to Multiply 2-digit Numbers by Multiples of 10
- 4.3 Estimate: Use Rounding

Students will be able to demonstrate:

- Use mental-math strategies to multiply by 2-digit by 2-digit multiples of ten.
- Use models and properties of operations to multiply 2-digit numbers by multiples of ten.

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• 4.4 Estimate: Use Compatible Numbers</li> <li>• 4.5 Arrays and Partial Products</li> <li>• 4.6 Multiply Using the Distributive Property</li> <li>• 4.7 Use Partial Products to Multiply by 2-digit Numbers</li> <li>• 4.8 Multiply 2-digit Numbers by Multiples of 10</li> <li>• 4.9 Multiply 2-digit Numbers by 2-digit Numbers</li> <li>• 4.10 Continue to Multiply 2-digit Numbers by 2-digit Numbers</li> <li>• 4.11 Math Practice and Problem Solving</li> </ul>                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>• Estimate products for 2-digit by 2-digit multiplication problems by rounding the factors to multiples of ten.</li> <li>• Use compatible numbers to estimate products for 2-digit by 2-digit multiplication problems</li> <li>• Use arrays, place value, partial products, and properties of operations to multiply two 2-digit numbers.</li> <li>• Use the Distributive Property and an area model to multiply two 2-digit numbers.</li> <li>• Use place value and partial products to calculate products of 2-digit by 2-digit multiplication problems.</li> <li>• Use area models and place-value strategies to multiply 2-digit numbers by multiples of 10.</li> <li>• Use the expanded and the standard algorithm to multiply 2-digit by 2-digit numbers. Estimate to check if products are reasonable.</li> <li>• Use models and algorithms to solve 2-digit by 2-digit multiplication problems.</li> <li>• Make sense of problems and persevere in solving them.</li> </ul> |
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| <b>Content Area: Math Topic 5</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Topic 5 = 8 days                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Unit Title: Use Strategies and Properties to Divide by 1-Digit Numbers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Grade Level: 4th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| CCSS Addressed: 4.NBT.B.6, 4.OA.A.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• 4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-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.</li> <li>• 4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## Topic 5 Summary

### Essential Questions:

- How can mental math be used to divide?
- How can quotients be estimated?
- How can the steps for dividing be explained?

### Enduring Understandings:

- Basic facts and place-value strategies to divide multiples of 10 or 100 by 1-digit numbers.
- There is more than one way to estimate a quotient. Substituting compatible numbers is an efficient technique for estimating quotients.
- There is more than one way to estimate a quotient. Using place-value patterns and compatible numbers are efficient techniques for estimating quotients.
- When dividing, the remainder must be less than the divisor. When solving a real-world problem, the kind of question asked determines how to interpret the remainder.
- Sharing is one way to think about division.
- Division with partial quotients involves breaking apart the dividend, dividing the parts, and adding the partial quotients.
- The standard division algorithm breaks the calculation into simpler calculations using basic facts, place-value, the relationship between multiplication and division, and estimation.
- Good math thinkers choose and apply math they know to show and solve problems from everyday life.

## Learning Targets

### Students will be able to understand:

- 5.1 Mental Math: Find Quotients
- 5.2 Mental Math: Estimate Quotients
- 5.3 Mental Math: Estimate Quotients for Greater Dividends
- 5.4 Interpret Remainders
- 5.5 Division as Sharing
- 5.6 Use Partial Quotients to Divide
- 5.7 Use Partial Quotients to Divide: Greater Dividends
- 5.8 Divide With 1-Digit Numbers
- 5.9 Continue to Divide with 1-Digit Numbers
- 5.10 Math Practice and Problem Solving: Model with Math

### Students will be able to demonstrate:

- Use mental-math and place-value strategies to divide multiples of 10 and 100 by 1-digit numbers.
- Use compatible numbers to estimate quotients.
- Use place-value patterns and division facts to estimate quotients for 4-digit dividends.
- Solve division problems and interpret remainders.
- Use place value and drawings to divide 2- and 3-digit numbers by 1-digit numbers.
- Use partial quotients to divide.
- Use partial quotients and place-value understandings to divide with greater dividends.
- Divide 2- and 3-digit numbers by 1-digits numbers using the standard division algorithm.
- Divide 4-digit numbers by 1-digit numbers using the standard division algorithm.

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• Use previously learned concepts and skills to model and solve problems.</li> </ul> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                             |
| <b>Content Area: Math Topic 6</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Topic 6 = 9 days                                                                                                            |
| Unit Title: Use operations with whole numbers to solve problems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                             |
| Grade Level: 4th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                             |
| CCSS Addressed: 4.OA.A.1, 4.OA.A.2, 4.NBT.B.5, 4.NBT.B.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                             |
| <ul style="list-style-type: none"> <li>• 4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret <math>35 = 5 \times 7</math> as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.</li> <li>• 4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.</li> <li>• 4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models</li> <li>• 4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-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.</li> </ul> |                                                                                                                             |

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| Topic 6 Summary                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p>Essential Questions:</p> <ul style="list-style-type: none"> <li>How is comparing with multiplication different from comparing with addition? How can you use equations to solve multi-step problems?</li> </ul>                                                                                                                             | <p>Enduring Understandings:</p> <ul style="list-style-type: none"> <li>Both addition and multiplication can be used to make comparisons. Bar diagrams and equations can be used to show both situations and to distinguish between them.</li> <li>Bar diagrams and equations can be used to solve problems involving multiplicative comparison.</li> <li>Sometimes there is a hidden question that must be answered before solving a problem. Bar diagrams and equations can represent problems and are helpful in answering both parts of a problem.</li> <li>Good math thinkers make sense of problems and think of ways to solve them. If they get stuck, they don't give up.</li> </ul> |
| Learning Targets                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p>Students will be able to understand:</p> <ul style="list-style-type: none"> <li>6.1 Solve Comparison Situations</li> <li>6.2 Continue to Solve Comparison Situations</li> <li>6.3 Solve Multi-step Problems</li> <li>6.4 Solve More Multi-step Problems</li> <li>6.5 Math Practices and Problem Solving: Make Sense and Preserve</li> </ul> | <p>Students will be able to demonstrate:</p> <ul style="list-style-type: none"> <li>Interpret comparisons as multiplication or addition equations.</li> <li>Use multiplication and division to compare quantities.</li> <li>Solve two-step problems by finding and solving the hidden question first.</li> <li>Solve multi-step problems by finding and solving hidden questions first.</li> <li>Make sense of a multi-step problem and keep working until it is solved.</li> </ul>                                                                                                                                                                                                         |
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| Content Area: Math Topic 7                                                                                                                                                                                                                                                                                                                     | Topic 7 = 10 days                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Unit Title: Understanding Facts and Multiples                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Grade Level: 4th                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

CCSS Addressed: 4.OA.B.4, 4.NBT.B.5

- 4.OA.B.4 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.
- 4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

### Topic 7 Summary

#### Essential Questions:

- How can you use arrays or multiplication to find the factors of a number?
- How can you identify prime and composite numbers?
- How can you find multiples of a number?

#### Enduring Understandings:

- Factors of a number  $n$  can be shown by arranging  $n$  counters into rows with the same number of counters in each row. The number of rows and the number of counters in each row are factors of  $n$ .
- Factors of a number can be found in pairs by thinking about multiplication.
- Good math thinkers look for things that repeat, and they make generalizations.
- Prime numbers have exactly 2 factors and composite numbers have more than 2.
- The product of any nonzero whole numbers and a given nonzero whole number is a multiple of both. Factors and multiples are closely related.

### Learning Targets

Students will be able to understand:

- 7.1 Understanding Factors
- 7.2 Factors
- 7.3 Math Practices and Problem Solving: Repeated Reasoning
- 7.4 Prime and Composite Numbers
- 7.5 Multiples

Students will be able to demonstrate:

- Use arrays to find the factors of a given whole number.
- Use multiplication to find all the factor pairs for a whole number.
- Use repeated reasoning to generalize how to solve problems that are similar.
- Use factors to determine whether a whole number greater than 1 is prime or composite.
- Use multiplication to find multiples of a given number.

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| <b>Content Area: Math Topic 8</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Topic 8= 11 days |
| Unit Title: Extend Understanding of Fractions Equivalence and Ordering                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |
| Grade Level: 4th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |
| CCSS Addressed: 4.NF.A.1, 4.NF.A.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |
| <ul style="list-style-type: none"> <li>4.NF.A.1 Explain why a fraction <math>a/b</math> is equivalent to a fraction <math>(n \times a)/(n \times b)</math> by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.</li> <li>4.NF.A.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as <math>1/2</math>. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>, and justify the conclusions, e.g., by using a visual fraction model.</li> </ul> |                  |

## Topic 8 Summary

### Essential Questions:

- What are some ways to name the same part of a whole?
- How can you compare fractions with unlike denominators?

### Enduring Understandings:

- Two fractions that represent the same part of the same whole are equivalent. The two fractions are different names for the same number.
- The same fractional amount can be represented by an infinite set of different but equivalent fractions.
- When the numerator and denominator of a fraction are multiplied by the same whole number greater than 1, it is the same as multiplying the fraction by 1. This gives an equivalent fraction between multiplying by 1 does not change the value of a number.
- When the numerator and denominator of a fraction are divided by a common factor, the result is an equivalent fraction.
- One way to compare two fractions that are parts of the same whole is by comparing each to a benchmark fraction such as  $\frac{1}{2}$ .
- When two fractions have the same denominator, the fractions with the greater numerator are greater. When two fractions have the same numerator, the fraction with the lesser denominator is greater.
- Good math thinkers use math to explain why they are right. They can talk about the math others do, too.

## Learning Targets

### Students will be able to understand:

- 8.1 Equivalent Fractions: Area models
- 8.2 Equivalent Fractions: Number lines
- 8.3 Generate Equivalent Fractions: Multiplication
- 8.4 Generate Equivalent Fractions: Division
- 8.5 Use Benchmarks to Compare Fractions
- 8.6 Compare Fractions
- 8.7 Math Practices and Problem Solving: Construct arguments

### Students will be able to demonstrate:

- Use area models to recognize and generate equivalent fractions.
- Use a number line to locate and identify equivalent fractions.
- Use multiplication to find equivalent fractions.
- Use division to find equivalent fractions.
- Use benchmarks, area models and number lines to compare fractions.
- Use models or rename fractions to compare.
- Construct arguments about fractions.

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| <b>Content Area: Math Topic 9</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Topic 9= 12 days |
| Unit Title: Understand Addition and Subtraction of Fractions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |
| Grade Level: 4th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |
| CCSS Addressed: 4.NF.B.3a, 4.NF.B.3b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |
| <ul style="list-style-type: none"> <li>4.NF.B.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.</li> <li>4.NF.B.3b Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. <i>Examples:</i> <math>\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}</math> ; <math>\frac{3}{8} = \frac{1}{8} + \frac{2}{8}</math> ; <math>2 \frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}</math>.</li> </ul> |                  |

## Topic 9 Summary

### Essential Questions:

- How do you add and subtract fractions and mixed numbers with like denominators?
- How can fractions be added and subtracted on a number line?

### Enduring Understandings:

- Models can be used to show addition of fractions as joining parts of the same whole.
- A fraction  $a/b$ , where  $a > 1$ , can be decomposed into the sum of two or more unit or non-unit fractions in one or more ways where the sum of the fractions is equal to the original fraction.
- Two fractions can be joined or added to find the total. There is a general method for adding fractions with like denominators.
- Models can be used to show subtractions of fractions as separating a part from the same whole.
- The difference between two fractions with like denominators can be found by separating one fractional amount from the other. There is a general method for subtracting fractions with like denominators.
- Fraction addition and subtraction can be thought about as joining and separating segments on the number line. They can also be thought about as counting forward or counting backward on a number line.
- Fraction sums and differences can be estimated by thinking about how each fraction relates to other fractions that are easy to add and subtract mentally.
- Adding and subtracting mixed numbers is an extension of the ideas and procedures for adding and subtracting fractions.
- Two procedures for adding mixed numbers both involve changing the calculation to a simpler equivalent calculation.
- Good math thinkers choose and apply math they know to show and solve problems from everyday life.

## Learning Targets

### Students will be able to understand:

- 9.1 Model Addition of Fractions
- 9.2 Decompose Fractions
- 9.3 Add Fractions With Like Denominators
- 9.4 Model Subtraction of Fractions
- 9.5 Subtract Fractions With Like Denominators
- 9.6 Add and Subtract Fractions With Like Denominators
- 9.7 Estimate Fraction Sums and Differences

### Students will be able to demonstrate:

- Use Fraction strips and number lines to add fractions.
- Decompose a fraction or mixed number into a sum of fractions in more than one way.
- Solve problems involving joining parts of the same whole by adding fractions.
- Use tools such as fraction strips, area models, and number lines to subtract fractions.
- Solve problems involving parts of the same whole by subtracting fractions.
- Count forward and backward on a number line to subtract or add.

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• 9.8 Model Addition and Subtraction of Mixed Numbers</li> <li>• 9.9 Add Mixed Numbers</li> <li>• 9.10 Subtract Mixed Numbers</li> <li>• 9.11 Math Practices and Problem Solving</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• Use number lines and benchmark fractions to estimate fraction sums and differences.</li> <li>• Use models and equivalent fractions to add and subtract mixed numbers.</li> <li>• Use equivalent fractions and properties of operations to add mixed numbers with like denominators.</li> <li>• Use equivalent fractions, properties of operations, and the relationship between addition and subtraction to subtract mixed numbers with like denominators.</li> <li>• Use previously learned concepts and skills to represent and solve problems.</li> </ul> |
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| <b>Content Area: Math Topic 10</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Topic 10= 7 days                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Unit Title: Extend Multiplication Concepts to Fractions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Grade Level: 4th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| CCSS Addressed: 4.NF.B.4a, 4.NF.B.4b, 4.NF.B.4c                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <ul style="list-style-type: none"> <li>• 4.NF.B.4a Understand a fraction <math>a/b</math> as a multiple of <math>1/b</math>. <i>For example, use a visual fraction model to represent <math>5/4</math> as the product <math>5 \times (1/4)</math>, recording the conclusion by the equation <math>5/4 = 5 \times (1/4)</math>.</i></li> <li>• 4.NF.B.4b Understand a multiple of <math>a/b</math> as a multiple of <math>1/b</math>, and use this understanding to multiply a fraction by a whole number. <i>For example, use a visual fraction model to express <math>3 \times (2/5)</math> as <math>6 \times (1/5)</math>, recognizing this product as <math>6/5</math>. (In general, <math>n \times (a/b) = (n \times a)/b</math>.)</i></li> <li>• 4.NF.B.4c Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. <i>For example, if each person at a party will eat <math>3/8</math> of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?</i></li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Topic 10 Summary

### Essential Questions:

- How can you describe a fraction by using a unit fraction?
- How can you multiply a whole number by a mixed number?

### Enduring Understandings:

- Any fraction  $a/b$  can be written as a times the unit fraction  $1/b$ .
- Models and equations can be used to represent problems and compute products of whole numbers and fractions.
- Models and equations can be used to represent problems and compute products of whole numbers and mixed numbers.
- The standard algorithm for adding, subtracting, multiplying, and dividing can be used to solve time problems.
- Good math thinkers choose and apply math they know to show and solve problems from everyday life.

## Learning Targets

### Students will be able to understand:

- 10.1 Fractions as Multiples of Unit Fractions: Use Models
- 10.2 Multiply a Fraction by a Whole Number: Use Models
- 10.3 Multiply a Fraction by a Whole Number: Use Symbols
- 10.4 Multiply a Whole Number and a Mixed Number
- 10.5 Solve Time Problems
- 10.6 Math Practices and Problem Solving: Model with Math

### Students will be able to demonstrate:

- Use a model to understand a fraction as a multiple of a unit fraction.
- Use models to multiply fractions by whole numbers.
- Use symbols and equations to multiply a fraction by a whole number.
- Use drawings and equations to represent and solve problems involving multiplying a whole number and a mixed number.
- Use the four operations to solve problems involving time.
- Use previously-learned concepts and skills to represent and solve problems.

## Content Area: Math Topic 11

Topic 11= 8 days

Unit Title: Represent and Interpret Data on Line Plots

Grade Level: 4th

CCSS Addressed: 4.MD.B.4, 4.NF.A.1, 4.NF.B.3d

- 4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit ( $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{8}$ ). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*
- 4.NF.A.1 Explain why a fraction  $\frac{a}{b}$  is equivalent to a fraction  $(n \times a)/(n \times b)$  by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
- 4.NF.B.3d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

### Topic 11 Summary

#### Essential Questions:

- How can you read data on a line plot?
- How can you make a line plot?

#### Enduring Understandings:

- A line plot organizes data on a number line and is useful for showing how data is distributed.
- Data from line plots can be used to solve problems.
- Good math thinkers use math to explain why they are right. They can talk about the math that others do, too.

### Learning Targets

#### Students will be able to understand:

- 11.1 Read Line Plots
- 11.2 Make Line Plots
- 11.3 Use Line Plots to Solve Problems
- 11.4 Math Practices and Problem Solving: Critique Reasoning.

#### Students will be able to demonstrate:

- Read and Interpret data using line plots.
- Represent data using line plots and interpret data in line plots to solve problems.
- Solve problems involving line plots and fractions.
- Critique the reasoning of others using an understanding of line plots.

### Content Area: Math Topic 12

Topic 12= 11 days

Unit Title: Understand and Compare Decimals

Grade Level: 4th

CCSS Addressed: 4.NF.C.6, 4.NF.C.7, 4.MD.A.2, 4.NF.C.5

- 4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. *For example, express  $\frac{3}{10}$  as  $\frac{30}{100}$ , and add  $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$ .*
- 4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
- 4.NF.C.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols  $>$ ,  $=$ , or  $<$ , and justify the conclusions, e.g., by using a visual model.
- 4.NF.C.6 Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite  $0.62$  as  $\frac{62}{100}$ ; describe a length as  $0.62$  meters; locate  $0.62$  on a number line diagram.*

### Topic 12 Summary

#### Essential Questions:

- How can you write a fraction as a decimal?
- How can you locate points on a number line?
- How do you compare decimals?

#### Enduring Understandings:

- A decimal is another way to represent a fraction.
- Points on a number line can represent fractions and decimals. A fraction and a decimal tell the distance a point is from 0 on the number line.
- Place value can be used to compare decimals.
- Fractions with denominators of 10 can be written as equivalent fractions with denominators of 100. Fractions with like denominators can be added.
- Fractions and decimals can be used to represent amounts of money. Pictorial models and equations can represent problems involving money.
- Good math thinkers look for relationship in math to help solve problems.

### Learning Targets

#### Students will be able to understand:

- 12.1 Fractions and decimals
- 12.2 Fractions and decimals on the number line
- 12.3 Compare decimals
- 12.4 Add fractions with denominators of 10 and 100

#### Students will be able to demonstrate:

- Relate fractions and decimals with denominators of 10 and 100.
- Locate and describe fractions and decimals on number lines.
- Compare decimals by reasoning about their size.
- Add fractions with denominators of 10 and 100 by using equivalent fractions.
- Use fractions or decimals to solve word problems involving money.

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| <ul style="list-style-type: none"> <li>12.5 Solve word problems involving money</li> <li>12.6 Math Practices and Problem Solving: Look and Use Structure</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>Use the structure of the place-value system for decimals to solve problems</li> </ul> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                              |
| <b>Content Area: Math Topic 13</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Topic 13= 10 days                                                                                                            |
| Unit Title: Measurement: Find Equivalence in Units of Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                              |
| Grade Level: 4th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                              |
| CCSS Addressed: 4.MD.A.1, 4.MD.A.2, 4.NF.B.3d, 4.NF.B.4c, 4.NBT.B.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                              |
| <ul style="list-style-type: none"> <li>4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. <i>For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...</i></li> <li>4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.</li> <li>4.NF.B.3d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.</li> <li>4.NF.B.4c Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. <i>For example, if each person at a party will eat <math>\frac{3}{8}</math> of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?</i></li> <li>4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</li> </ul> |                                                                                                                              |

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| Topic 13 Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p>Essential Questions:</p> <ul style="list-style-type: none"> <li>How can you convert from one unit to another?</li> <li>How can you be precise when solving math problems?</li> </ul>                                                                                                                                                                                                                                                                                                              | <p>Enduring Understandings:</p> <ul style="list-style-type: none"> <li>To convert from a larger unit of length to a smaller unit of length, multiply the number of larger units by the conversion factor, that is, the number of smaller units in each larger unit.</li> <li>Some problems can be solved by applying the formula for the perimeter of a rectangle or the formula of area of a rectangle.</li> <li>Good math thinkers are careful about what they write and say, so their ideas about math are clear.</li> </ul>                                                                                                                                                                                                                                                                 |
| Learning Targets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p>Students will be able to understand:</p> <ul style="list-style-type: none"> <li>13.1 Equivalence with Customary Units of Length</li> <li>13.2 Equivalence with Customary Units of Capacity</li> <li>13.3 Equivalence with Customary Units of Weight</li> <li>13.4 Equivalence with Metric Units of Length</li> <li>13.5 Equivalence with Metric Units of Capacity and Mass</li> <li>13.6 Solve Perimeter and Area Problems</li> <li>13.7 Math Practices and Problem Solving: Precision</li> </ul> | <p>Students will be able to demonstrate:</p> <ul style="list-style-type: none"> <li>Recognize the relative size of customary units of length and convert from a larger unit to a smaller unit.</li> <li>Recognize the relative size of customary units of capacity and convert from a larger unit to a smaller unit.</li> <li>Recognize the relative size of customary units of weight and convert from a larger unit to a smaller unit.</li> <li>Recognize the relative size of a metric units of length and convert from a larger unit to a smaller unit.</li> <li>Recognize the relative size of metric units of capacity and mass, and convert from a larger unit to a smaller unit.</li> <li>Find the unknown length or width of a rectangle using the known area or perimeter.</li> </ul> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Content Area: Math Topic 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Topic 14= 11 days                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Unit Title: Algebra: Generate and Analyze Patterns                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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| Grade Level: 4th                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| CCSS Addressed: 4.OA.C.5                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"> <li>4.OA.C.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. <i>For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.</i></li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Topic 14 Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p>Essential Questions:</p> <ul style="list-style-type: none"> <li>How can you use a rule to continue a pattern?</li> <li>How can you use a table to extend a pattern?</li> <li>How can you use a repeating pattern to predict a shape?</li> </ul>                                                                                                                                                                                                                                   | <p>Enduring Understandings:</p> <ul style="list-style-type: none"> <li>Rules can be used to create or extend number sequences that form a pattern. Those patterns sometimes have features not described by the rule.</li> <li>Rules can be used to create or extend patterns in tables. Patterns sometimes have features not described by the rule.</li> <li>It is possible to predict the shape in a repeating pattern of shapes.</li> <li>Good Math thinkers look for relationships in math to help solve problems.</li> </ul> |
| Learning Targets                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p>Students will be able to understand:</p> <ul style="list-style-type: none"> <li>14.1 Number Sequences</li> <li>14.2 Patterns: Number Rules</li> <li>14.3 Patterns: Repeating Shapes</li> <li>14.4 Math Practices and Problem Solving: Look for and use structure</li> </ul>                                                                                                                                                                                                       | <p>Students will be able to demonstrate:</p> <ul style="list-style-type: none"> <li>Create or extend a number sequence based on a rule. Identify features of the pattern in the sequence that are not described by the rule.</li> <li>Use a rule to extend a number pattern and solve a problem.. Identify features of the pattern.</li> <li>Generate a shape pattern that follows a given rule and predict a shape in the pattern.</li> <li>Solve problems using patterns.</li> </ul>                                           |
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| Content Area: Math Topic 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Topic 15= 8 days                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Unit Title: Geometric Measurement: Understand Concepts of Angles and Angle Measurement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Grade Level: 4th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| CCSS Addressed: 4.MD.C.5, 4.G.A.1, 4.MD.C.5a, 4.MD.C.5b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <ul style="list-style-type: none"> <li>4.MD.C.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.</li> <li>4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.</li> <li>4.MD.C.5a An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through <math>\frac{1}{360}</math> of a circle is called a “one-degree angle,” and can be used to measure angles.</li> <li>4.MD.C.5b An angle that turns through <math>n</math> one-degree angles is said to have an angle measure of <math>n</math> degrees.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Topic 15 Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p>Essential Questions:</p> <ul style="list-style-type: none"> <li>What are some common geometric terms?</li> <li>How can you measure angles?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>Enduring Understandings:</p> <ul style="list-style-type: none"> <li>Line segments and rays are sets of points that describe parts of lines and angles. Angles are classified by their measure.</li> <li>The measure of an angle depends upon the fraction of a circle that the angle turns through.</li> <li>The unit for measuring angles is <math>1^\circ</math>, the unit angle.</li> <li>The unit for measuring angles is <math>1^\circ</math>, the unit angle. A protractor can be used to measure angles.</li> <li>Angle measures can be added and subtracted.</li> <li>Good math thinkers know how to pick the right tools to solve math problems.</li> </ul> |
| Learning Targets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p>Students will be able to understand:</p> <ul style="list-style-type: none"> <li>15.1 Lines, Rays, and Angles</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>Students will be able to demonstrate:</p> <ul style="list-style-type: none"> <li>Recognize and draw lines, rays, and angles with different measures.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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| <ul style="list-style-type: none"> <li>• 15.2 Understand Angles and Unit Angles</li> <li>• 15.3 Measure with Unit Angles</li> <li>• 15.4 Measure and Draw Angles</li> <li>• 15.5 Add and Subtract Angles Measures</li> <li>• 15.6 Math Practices and Problem Solving: Use Appropriate Tools</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• Find the measure of an angle that turns through a circle.</li> <li>• Use known angle measures to measure unknown angles.</li> <li>• Use a protractor to measure and draw angles.</li> <li>• Use addition and subtraction to solve problems with unknown angles measures.</li> <li>• Use appropriate tools, such as a protractor and ruler, to solve problems.</li> </ul> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Content Area: Math Topic 16</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Topic 16= 8 days                                                                                                                                                                                                                                                                                                                                                                                                  |
| Unit Title: Lines, Angles, and Shapes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Grade Level: 4th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                   |
| CCSS Addressed: 4.G.A.1, 4.G.A.2, 4.G.A.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <ul style="list-style-type: none"> <li>• 4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.</li> <li>• 4.G.A.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.</li> <li>• 4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Topic 16 Summary

### Essential Questions:

- How can you classify triangles and quadrilaterals?
- What is line Symmetry?

### Enduring Understandings:

- Lines can be classified as parallel, intersecting, or perpendicular.
- Triangles are classified by their sides and by their angles.
- Quadrilaterals are classified by their sides and by their angles.
- A shape that can fold along a line into matching parts is line symmetric.
- Good math thinkers use math to explain why they are right.

## Learning Targets

### Students will be able to understand:

- 16.1 Lines
- 16.2 Classify Triangles
- 16.3 Classify Quadrilaterals
- 16.4 Line Symmetry
- 16.5 Draw Shapes with Line Symmetry
- 16.6 Math Practices and Problem Solving: Critique Reasoning

### Students will be able to demonstrate:

- Draw and identify perpendicular, parallel, and intersecting lines.
- Classify triangles by line segments and angles.
- Classify quadrilaterals by lines and angles.
- Recognize and draw lines of symmetry. Identify line symmetric figures.
- Draw figures that have line symmetry.
- Use understanding of two-dimensional shapes to critique the reasoning of others.

## 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.  
CRP7. Employ valid and reliable research strategies.  
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.  
CRP9. 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<br>Students will:                                                                                                                                                                                      | Indicator                                                                                                                                                             |
| P                 | Understand and use technology systems.                                                                                                                                                                                   | 8.1.P.A.1<br>Use an input device to select an item and navigate the screen                                                                                            |
|                   |                                                                                                                                                                                                                          | 8.1.P.A.2<br>Navigate the basic functions of a browser.                                                                                                               |
|                   | Select and use applications effectively and productively.                                                                                                                                                                | 8.1.P.A.3<br>Use digital devices to create stories with pictures, numbers, letters and words.                                                                         |
|                   |                                                                                                                                                                                                                          | 8.1.P.A.4<br>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<br>Demonstrate the ability to access and use resources on a computing device.                                                                               |
| K-2               | Understand and use technology systems.                                                                                                                                                                                   | 8.1.2.A.1<br>Identify the basic features of a digital device and explain its purpose.                                                                                 |

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|     | Select and use applications effectively and productively. | 8.1.2.A.2<br>Create a document using a word processing application.                                                                              |
|     |                                                           | 8.1.2.A.3<br>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<br>Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).                            |
|     |                                                           | 8.1.2.A.5<br>Enter information into a spreadsheet and sort the information.                                                                      |
|     |                                                           | 8.1.2.A.6<br>Identify the structure and components of a database.                                                                                |
|     |                                                           | 8.1.2.A.7<br>Enter information into a database or spreadsheet and filter the information.                                                        |
| 3-5 | Understand and use technology systems.                    | 8.1.5.A.1<br>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<br>Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.               |
|     |                                                           | 8.1.5.A.3<br>Use a graphic organizer to organize information about problem or issue.                                                             |
|     |                                                           | 8.1.5.A.4<br>Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.                                |
|     |                                                           | 8.1.5.A.5<br>Create and use a database to answer basic questions.                                                                                |

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|                   |                                                                                                                                                                | 8.1.5.A.6<br>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<br>Demonstrate knowledge of a real world problem using digital tools.                                                                                                                          |
|                   | Select and use applications effectively and productively.                                                                                                      | 8.1.8.A.2<br>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<br>Use and/or develop a simulation that provides an environment to solve a real world problem or theory.                                                                                       |
|                   |                                                                                                                                                                | 8.1.8.A.4<br>Graph and calculate data within a spreadsheet and present a summary of the results                                                                                                          |
|                   |                                                                                                                                                                | 8.1.8.A.5<br>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<br>Students will:                                                                                                                            | Indicator                                                                                                                                                                                                |
| P                 |                                                                                                                                                                | 8.1.P.B.1<br>Create a story about a picture taken by the student on a digital camera or mobile device.                                                                                                   |
| K-2               |                                                                                                                                                                | 8.1.2.B.1<br>Illustrate and communicate original ideas and stories using multiple digital tools and resources.                                                                                           |
| 3-5               |                                                                                                                                                                | 8.1.5.B.1<br>Collaborative to produce a digital story about a significant local event or issue based on first-                                                                                           |

|                   |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                              |
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|                   |                                                                                                                                                                                                                                   | person interviews.                                                                                                                                                                                                                                           |
| 6-8               |                                                                                                                                                                                                                                   | 8.1.8.B.1<br>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<br>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<br>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<br>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<br>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<br>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<br>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<br>Understand the need for and use of copyrights.                                                                                                                         |
|                   |                                                                                       | 8.1.5.D.2<br>Analyze the resource citations in online materials for proper use.                                                                                                     |
|                   | Demonstrate personal responsibility for lifelong learning.                            | 8.1.5.D.3<br>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<br>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<br>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<br>Demonstrate the application of appropriate citations to digital content.                                                                                               |
|                   |                                                                                       | 8.1.8.D.3<br>Demonstrate an understanding of fair use and Creative Commons to intellectual property.                                                                                |
|                   | Exhibit leadership for digital citizenship.                                           | 8.1.8.D.4<br>Assess the credibility and accuracy of digital content.                                                                                                                |
|                   |                                                                                       | 8.1.8.D.5<br>Understand appropriate uses for social media and the negative consequences of misuse.                                                                                  |

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| 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<br>Use the Internet to explore and investigate questions with a teacher's support.                                                                                                           |
| K-2               | Plan strategies to guide inquiry<br>Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.<br>Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.                                      | 8.1.2.E.1<br>Use digital tools and online resources to explore a problem or issue.                                                                                                                     |
| 3-5               | Plan strategies to guide inquiry.<br>Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.<br>Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.                                     | 8.1.5.E.1<br>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.<br>Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.<br>Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.<br>Process data and report results. | 8.1.8.E.1<br>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.<br>Plan and manage activities to develop a solution or complete a                                                                                                                                                      | 8.1.2.F.1<br>Use geographic mapping tools to plan and solve problems                                                                                                                                   |

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

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| Content Area | Technology                                                                                                                                                                                                                                                                                                                                        |
| Standard     | <p>8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming:</p> <p>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.</p> |
| 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. |

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|              | 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 |                                                                                                                                                                                              |

|                         |                                                                     |                                                                                                                                                                                                                                                                                                                                        |                                                                               |
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| Standard                |                                                                     | 8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming:<br>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<br>Level<br>bands | Content Statement<br>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. |

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| 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.                                                         |

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|              | 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:<br>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<br><br>Students will be able to understand:                                                           | Indicator | Indicator                                                                                    |
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| 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.    |

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|     |                                                                                                                         | 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.                                                        |

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|                   | 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 include 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:<br>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<br>Students will understand how to:                                                                   | Indicator                                                                                                                                                                                                                                                                                                                              | Indicator                                                                                                                                                                                                                  |

|     |                                                      |           |                                                                                                                                                                                   |
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| 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.                                                    |

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|     | 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.                                                                                               |

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| Content Area      |                                                                                          | Technology                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                         |
| Standard          |                                                                                          | 8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming:<br>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<br>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).                                                                                                            |

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|     |                                                                                          | 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).

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| <b>Flexible grouping</b>                                                | Students might be instructed as a whole group, in small groups of various permutations (homogeneous or heterogeneous by skill or interest), in pairs or individuals. Any small groups or pairs change over time based on assessment data.                                                                                                                                                                                                                                                                                                            |
| <b>Multiple Intelligence or Learning Style options</b>                  | 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.)                                                                                                                                                                                                                                                                                                                                                  |
| <b>Varying scaffolding of same organizer</b>                            | Provide graphic organizers that require students to complete various amounts of information.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Think-Pair-Share by readiness, interest, and/or learning profile</b> | 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.                                                                                                                                                                                                                                                                                                                                             |
| <b>Mini workshops to re-teach or extend skills</b>                      | A short, specific lesson with a student or group of students that focuses on one area of interest or reinforcement of a specific skill.                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Games to practice mastery of information and skill</b>               | Use games as a way to review and reinforce concepts. Include questions and tasks that are on a variety of cognitive levels.                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Multiple levels of questions</b>                                     | 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.                                                                                                                                                                                                                                                                                               |
| <b>High Prep Strategies (add to list as needed)</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Cubing</b>                                                           | 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.                                                                                                                                                                                              |
| <b>Tiered assignment/ product</b>                                       | 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.                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Independent studies</b>                                              | 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.                                                                                                                                                                                                                                                                                              |
| <b>Jigsaw</b>                                                           | 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 |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | to get there.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Multiple texts</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | The teacher obtains or creates a variety of texts at different reading levels to assign strategically to students.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Alternative assessments</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 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).                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Modified Assessments</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 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.                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Literature circles</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Flexible grouping of students who engage in different studies of a piece of literature. Groups can be heterogeneous and homogeneous.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Learning Centers</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 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.                                                                                                                                                                                                                                               |
| <b>Tic-Tac-Toe Choice Board</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 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. |
| <p>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 <a href="http://www.nagc.org">www.nagc.org</a>. In addition, information can be found at <a href="http://www.state.nj.us/education/aps/ccs/gandt">www.state.nj.us/education/aps/ccs/gandt</a>.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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

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| <ul style="list-style-type: none"> <li>• Plan cooperative learning experiences</li> <li>• Provide language experience</li> <li>• Give immediate feedback</li> <li>• Have student repeat directions</li> <li>• Make/use vocabulary files</li> <li>• Teach study skills</li> <li>• Use study guides to organize materials</li> <li>• Repeat/review/drill</li> </ul>                                                                                                                            | <ul style="list-style-type: none"> <li>• Write a different test</li> <li>• Shorten test length</li> <li>• Require only selected test items</li> <li>• Create alternative assessment</li> </ul> |
| <p>ASSIGNMENTS:</p> <ul style="list-style-type: none"> <li>• Lower reading level</li> <li>• Give directions in small, distinct steps</li> <li>• Allow copying from paper/book</li> <li>• Use written backup for oral directions</li> <li>• Lower difficulty level</li> <li>• Shorten assignment</li> <li>• Read directions to students</li> <li>• Give oral clues or prompts</li> <li>• Record or type assignments</li> <li>• Adapt worksheets, packets Use alternate assignments</li> </ul> | <p>GRADING:</p> <ul style="list-style-type: none"> <li>• Modify grading system</li> <li>• Modify weights of course components</li> <li>• Modify course objectives/outcome</li> </ul>           |

| Classroom Accommodations for E.L.L                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                      |
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| <p>Environment:</p> <ul style="list-style-type: none"> <li>• Preferential Seating</li> <li>• Assign peer tutor</li> <li>• Visual charts/cues</li> <li>• Provide tape recorded discourse</li> <li>• Highlight key words</li> <li>• Use real objects/manipulatives</li> <li>• Refer to prior knowledge (K-W-L or other)</li> <li>• Provide quiet study space</li> </ul> | <p>Assignment:</p> <ul style="list-style-type: none"> <li>• Adjust reading level materials</li> <li>• Single step directions</li> <li>• Provide extra examples/models</li> <li>• Shorten assignment/task</li> <li>• Directions read aloud</li> <li>• Adapt/simplify language on task</li> <li>• Give oral prompts/cues</li> <li>• Allow projects to replace written tasks</li> </ul> |
| <p>Presentation:</p> <ul style="list-style-type: none"> <li>• Individual/small group discussions</li> <li>• Use specialized curriculum/equipment</li> <li>• Simplify language/key word</li> </ul>                                                                                                                                                                     | <p>Materials:</p> <ul style="list-style-type: none"> <li>• Provide tape recorded text</li> <li>• Provide supplementary materials</li> <li>• Highlighted text</li> </ul>                                                                                                                                                                                                              |

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| <ul style="list-style-type: none"> <li>• Demonstrations for key concepts</li> <li>• Visual or Multi-modal presentations</li> <li>• Frequently check for understanding</li> <li>• Use manipulatives</li> <li>• Native Language presentations</li> </ul>                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• Bilingual dictionaries/glossaries</li> <li>• Use of graphic organizers</li> <li>• Pre-teach all vocabulary</li> <li>• Provide varied visual/multi-sensory input</li> <li>• Native Language Text</li> </ul>                                                                                                                                                       |
| <p>Management:</p> <ul style="list-style-type: none"> <li>• Allow oral responses</li> <li>• Use positive reinforcement</li> <li>• Repeat all directions</li> <li>• Use cooperative learning groups</li> <li>• Use projects/interdisciplinary tasks</li> <li>• Provide language experience tasks</li> <li>• Have student repeat directions</li> <li>• Immediate praise/feedback</li> <li>• Plan peer tutors/models</li> <li>• Provide high interest topics/options</li> <li>• Provide extended time to complete tasks</li> <li>• Allow student to think/speak in native language</li> </ul> | <p>Class Assessment:</p> <ul style="list-style-type: none"> <li>• Allow oral responses</li> <li>• Read test aloud</li> <li>• Read portions/key words on test</li> <li>• Modify format/length of test</li> <li>• Alternate with culturally non-biased items</li> <li>• Provide glossaries in native language</li> <li>• Modify test items/weighted scores</li> <li>• Use multiple choice format</li> </ul> |

| Accommodations for English Language Learners General Classroom and Content Areas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
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| <p style="text-align: center;"><b>MATH:</b></p> <ul style="list-style-type: none"> <li>• At beginning to intermediate levels of proficiency, English Language Learners should be shown examples of a completed assignment to model the correct format.</li> <li>• Assignments and directions should be printed on the board along with cursive representation.</li> <li>• A bilingual assistant/interpreter, when available, could be used to explain math concepts in the student's primary language.</li> <li>• Students should have access to counters, number lines and other types of manipulatives, which enable them to complete assignments at their level of instruction.</li> <li>• Rewrite story problems in simpler English. Use short sentences, pictures, and illustrations to encourage understanding.</li> <li>• Show students how to prepare a card file of number words. Write the word on one side and the symbol on the opposite side.</li> </ul> <p style="text-align: center;"><b>SOCIAL STUDIES</b></p> <ul style="list-style-type: none"> <li>• Allow beginning and advanced beginning students to use drawings to demonstrate knowledge of concepts.</li> <li>• Show English Language Learners at all proficiency levels a model of a project/assignment prior to their completing the assignment.</li> <li>• Teach the key concepts while limiting the vocabulary and details in the lesson.</li> <li>• Test only those key concepts addressed.</li> <li>• Use many visual aids during the instruction process; i.e. overhead transparencies, maps, graphic organizers, puzzles, computer, etc.</li> </ul> |  |

- 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](http://www.nagc.org). In addition, information can be found at [www.state.nj.us/education/aps/ccs/gandt](http://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