Estell Manor Wildcats

Curriculum

Math
Grade K

BOE Approved: September 2022

Estell Manor School District

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Our Mission:

About the Standards

Pacing Guide

Content Area: Math Topic 1
- Topic 1 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets

Content Area: Math Topics 2
- Topic 2 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets

Content Area: Math Topic 3
- Topic 3 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets

Content Area: Math Topic 4
- Topic 4 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets

Content Area: Math Topic 5
- Topic 5 Summary

- Essential Questions:
- Enduring Understandings:
- Learning Targets

Content Area: Math Topic 6
- Topic 6 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets
- Topic 7 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets

Content Area: Math Topic 8
- Topic 8 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets

Content Area: Math Topic 9
- Topic 9 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets

Content Area: Math Topic 10
- Topic 10 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets

Content Area: Math Topic 11
- Topic 11 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets

Content Area: Math Topic 12
- Topic 12 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets

Content Area: Math Topic 13
- Topic 13 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets

Content Area: Math Topic 14
- Topic 14 Summary
  - Essential Questions:
  - Enduring Understandings:
  - Learning Targets

Assessments
- Benchmark:
- Formative:
- Alternative Assessments:

Interdisciplinary Connections:

21st Century Skills & Career Education

Integration of Technology Standards

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

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

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

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

Accommodations and Modifications for students at risk of failing:

Estell Manor School

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

Our Mission:

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

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

About the Standards

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

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

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

Estell Manor School
Math: Kindergarten

Pacing Guide

Course Title: Math	Grade level: Kindergarten

Topic	Unit of Study	Topic	Unit of Study
1	Numbers 0 to 5: 15 days	8	More Addition and Subtraction: 14 days
2	Compare Numbers 0 to 5: 10 days	9	Count Numbers to 20: 11 days
3	Numbers 6 to 10: 12 days	10	Compose and Decompose Numbers 11 to 19: 12 days
4	Comparing Numbers 0 to 10 : 10 days	11	Count Numbers to 100:: 12 days
5	Classify and Count Data: 8 days	12	Identify and Describe Shapes: 11 days
6	Understand Addition: 14 days	13	Analyze, Compare, and Create Shapes: 10 days
7	Understand Subtraction: 13 days	14	Describe and Compare Measurable Attributes: 8 days

Instruction Materials/Additional Resources:
Math K-4/EnVision 2.0 Math/Scott Foresman/2020, www.pearsonsuccessnet.com
Classroom Manipulatives, EDC Calendar Math activities, http://www.sumdog.com, http://www.funbrain.com, http://www.mathplayground.com, http://www.mathsisfun.com, http://www.gamequarium.com, http://www.abcmouse.com, http://www.abcya.com

Estell Manor School Kindergarten Math Curriculum Overview	
Content Area: Math Topic 1	Topic 1=15 Days/September
Unit Title: Numbers 0 to 5	
Grade Level: Kindergarten	
CCSS Addressed:K.CC.3, K.CC.4, K.CC.5, K.OA.3	
• K.CC.3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). • K..CC.4. Understand the relationship between numbers and quantities; connect counting to cardinality. • 4a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. • 4b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. • 4c. Understand that each successive number refers to a quantity that is one larger. • K.CC.5. Count to answer ―how many?‖ questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects. • K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5= 2+3 and 5= 4+1)	

Topic 1 Summary

Essential Questions:

- How can numbers 0-5 be counted, read, and written?

Enduring Understandings:

- Counting tells how many are in a group, regardless of their arrangement or the order in which they were counted.
- The last number said when counting a set is the total. Counting is cumulative.
- There is a unique symbol that goes with each number word.
- Zero is a number that tells how many objects there are when there are none.
- There is more than one way to show a number.
- 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:

- 1.1 Counting 1,2, and 3
- 1.2 Recognize 1, 2, and 3 in Different Arrangements
- 1.3 Reading and Writing 1,2, and 3
- 1.4 Counting 4 and 5
- 1.5 Recognize 4 and 5 in Different Arrangements
- 1.6 Reading and Writing 4 and 5
- 1.7 Identify the Number 0
- 1.8 Read and Write 0
- 1.9 Ways to Make 5
- 1.10 Count Numbers to 5
- 1.11 Construct Arguments

Students will be able to demonstrate:

- Know number names and the count sequence.
- Count to tell the number of objects.
- Understand addition as putting together and adding to, and understanding subtraction as taking apart and taking from.
- Construct viable arguments and critique the reasoning of others.

Content Area: Math Topics 2	Topic 2: 10 days/September-October
Unit Title: Compare Numbers 0 to 5	
Grade Level: Kindergarten	
CCSS Addressed: K.CC.6, K.CC.7	
• K.CC.6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. • K.CC.7. Compare two numbers between 1 and 10 presented as written numerals.	
Topic 2 Summary	
Essential Questions: • How can numbers 0 -5 be compared and ordered?	Enduring Understandings: • Two groups of objects are equal in number if they can be directly matched, one-to-one, with no extras in either group. • Two groups of objects can be directly compared using a matching process. • Two sets of objects can be compared by number using counting strategies, which is a more efficient method than matching. • Two numbers can be compared by using the counting number sequence. A number represents a quantity greater than another quantity if it is later in the sequence. • Good math thinkers use math they know to show and solve problems.
Learning Targets	
Students will be able to understand: • 2.1 Equal Groups • 2.2 Greater Than • 2.3 Less Than	Students will be able to demonstrate: • Compare numbers. • Use objects, drawings, and numbers to compare numbers.

• 2.4 Compare Groups to 5 by Counting • 2.5 Compare Numbers to 5 • 2.6 Model with Math	
Content Area: Math Topic 3	Topic 3 = 12 days/ October
Unit Title: Numbers 6 to 10	
Grade Level: Kindergarten	
CCSS Addressed: K.CC.3., K.CC.4., K.CC.5., K.OA.3	
• K.CC.3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). • K.CC.4. Understand the relationship between numbers and quantities; connect counting to cardinality. • 4a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. • 4b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. • K.CC.5. Count to answer ―how many?‖ questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects. • K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5= 2+3 and 5= 4+1)	

Topic 3 Summary	
Essential Questions: • How can numbers 6-10 be counted, read, and written?	Enduring Understandings: • Counting tells how many are in a set no matter which order the numbers are counted. The last number said when counting a set is the total. Counting is cumulative. • There is a unique symbol that goes with each number word. • There is more than one way to show a number. • Good math thinkers look for patterns in math to help solve problems.
Learning Targets	
Students will be able to understand: • 3.1 Counting 6 and 7 • 3.2 Reading and Writing 6 and 7 • 3.3 Counting 8 and 9 • 3.4 Reading and Writing 8 and 9 • 3.5 Counting 10 • 3.6 Reading and Writing 10 • 3.7 Ways to Make 10 • 3.8 Look for and Use Structure	Students will be able to demonstrate: • Know number names and the count sequence. • Count to tell the number of objects. • Understand addition as putting together and adding to, and understanding subtraction as taking apart and taking from. • Use counting patterns to solve a problem.
Content Area: Math Topic 4	Topic 4 = 10 days/November-December
Unit Title: Compare Numbers 0 to 10	

Grade Level: Kindergarten

CCSS Addressed: K.CC.2, K.CC.6, KCC.7

- K.CC.2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
- K.CC.6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.1
- K.CC.7. Compare two numbers between 1 and 10 presented as written numerals

Topic 4 Summary

Essential Questions:

- How can numbers from 0-10 be compared and ordered?

Enduring Understandings:

- In comparing two groups, the group with more objects is greater in number than the other. The group with fewer objects is less in number than the other.
- In a pair of numbers, the number that shows more is greater. The number that shows fewer is less.
- Two groups can be compared by counting the number of objects in each group and finding the position of each number within the counting sequence.
- Two numbers can be compared by finding the position of each number within the counting sequence.
- Good math thinkers look for things that repeat in a problem. They use what they learn from one problem to help them solve other problems.

Learning Targets

Students will be able to understand:

- 4.1 Compare Groups to 10
- 4.2 Compare Numbers using Numerals to 10
- 4.3 Compare Groups of 10 by Counting
- 4.4 Compare Numbers to 10
- 4.5 Count Numbers to 10

Students will be able to demonstrate:

- Know number names and the count sequence
- Compare numbers.
- Repeat something from one problem to help solve another problem.

• 4.6 Repeated Reasoning	
Content Area: Math Topic 5	Topic 5 = 8 days/December
Unit Title: Classify and Count Data	
Grade Level: Kindergarten	
CCSS Addressed: K.MD.B.3, MP.3	
• K.MD.B.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. • MP.3 Construct viable arguments and critique the reasoning of others.	

Topic 5 Summary	
Essential Questions: • How can classifying data help answer questions?	Enduring Understandings: • Objects can be classified into two categories, based on whether they have or do not have a particular attribute. Each group can then be counted. • Data can be sorted and compared in a variety of ways. Objects can be sorted by putting those with a particular attribute in one group and those without the attribute in another group. Then, the groups can be counted and the categories can be compared by count. • 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: • 5.1 Classify Objects into Categories • 5.2 Count the Number of Objects in Each Category • 5.3 Sort the Categories by Counting • 5.4 Critique Reasoning	Students will be able to demonstrate: • Classify objects into categories and tell why they are in each category. • Count how many objects are in different categories. • Use counting to compare how many objects are in categories. • Tell whether the way objects have been sorted, counted, and compared makes sense.
Content Area: Math Topic 6	Topic 6 = 14 days/December-January
Unit Title: Understand Addition	
Grade Level: Kindergarten	

CCSS Addressed: K.OA.A.1, K.OA.A.2, K.OA.A.5

- K.OA.A.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations.
- K.OA.A.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., byb using objects or drawings to represent the problem.
- K.OA.A.5 Fluently add and subtract within 5.

Topic 6 Summary

Essential Questions:

- What types of situations involve additions?

Enduring Understandings:

- Addition can be shown in different ways, such as with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations.
- Adding one or more objects to an existing group is one interpretation of addition.
- Putting together parts to make a whole is one interpretation of addition.
- Adding group scan be shown in an addition expression that uses the plus sign (+).
- Adding parts together to make a whole is one interpretation of addition. Equations using + and = can be used to show parts of a whole.
- Objects, drawings, counting, and equations can be used to help solve addition problems involving adding to.
- Objects, drawings, counting, and equations can be used to help solve addition problems involving putting together.
- Patterns can be used to help solve addition problems.
- Good math thinkers use math they know to show and solve problems.

Learning Targets

Students will be able to understand:

- 6.1 Explore Addition
- 6.2 Represent Addition as Adding To
- 6.3 Represent Addition as Putting Together
- 6.4 Use the Plus Sign
- 6.5 Represent and Explain Addition with Equations
- 6.6 Continue to Represent and Explain Addition with Equations
- 6.7 Solve Addition Word Problems: Add To
- 6.8 Solve Addition Word Problems: Put Together

Students will be able to demonstrate:

- Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.
- Model adding different numbers together by drawing, counting, or writing equations.

• 6.9 Use Patterns to Develop Fluency in Addition • 6.10 Model with Math	
Content Area: Math Topic 7	Topic 7 = 13 days/ January
Unit Title: Understanding Subtraction	
Grade Level: Kindergarten	
CCSS Addressed: K.OA.1, K.OA.2, K.OA.5	
• K.OA.1. Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. • K.OA.2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem. • K.OA.5. Fluently add and subtract within 5.	

Topic 7 Summary

Essential Questions:

- How can representing taking apart and taking from in different ways help you learn about subtraction?

Enduring Understandings:

- Subtraction can be shown in different ways, such as with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations.
- Separating parts from a whole is one interpretation of subtraction.
- Taking parts from a whole is one interpretation of subtraction.
- Take apart and take from subtraction situations can be shown in a subtraction expression that uses the minus sign (-).
- Subtraction equations using - and = can be used to show subtraction situations.
- Objects, drawings, counting, and equations can be used to help solve subtractions problems involving taking from..
- Patterns can be used to help solve subtraction problems.
- Good math thinkers know how to pick the right tools to solve math problems.

Learning Targets

Students will be able to understand:

- 7.1 Explore Subtraction
- 7.2 Represent Subtraction as Taking Apart
- 7.3 Represent Subtraction as Taking From
- 7.4 Using the Minus Sign
- 7.5 Represent and Explain Subtraction with Equations
- 7.6 Continue to Represent and Explain Subtraction with Equations
- 7.7 Solve Subtraction Word Problems: Take From
- 7.8 Use Patterns to Develop Fluency in Subtraction
- 7.9 Use Appropriate Tools

Students will be able to demonstrate:

- Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.
- Use tools to subtract numbers.

Content Area: Math Topic 8	Topic 8= 14 days/January-February
Unit Title: More Addition and Subtraction	
Grade Level: Kindergarten	
CCSS Addressed: K.OA.2, K.OA.3,K.OA.4, K.OA.5	

- K.OA.2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
- K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2+3 and 5 = 4+1)
- K.OA.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
- K.OA.5. Fluently add and subtract within 5.

Topic 8 Summary	
Essential Questions: ● How can numbers to 20 be counted, read and written?	Enduring Understandings: ● There is a unique symbol that goes with each number word. ● You use the count sequence to count from any number within 20. Numbers become greater when you count on. ● Counting tells how many are in a set, regardless of their arrangement or the order in which they were counted. ● The last number said when counting a set is the total. ● Counting is cumulative. ● Good math thinkers know how to think about words and numbers to solve problems.
Learning Targets	
Students will be able to understand: ● 9.1 Count and write the numbers 11 and 12 ● 9.2 Count and write the numbers 13, 14, and 15 ● 9.3 Count and write the numbers 16 and 17 ● 9.4 Count and write the numbers 18, 19, and 20 ● 9.5 Count forward from any number to a number within 20 ● 9.6 Count to find how many are in a group ● 9.7 Use reasoning to count and write numbers to the number 20	Students will be able to demonstrate: ● Know number names and count sequence ● Count to tell the number of objects ● Use reasoning to count and write numbers to the number 20
Content Area: Math Topic 9	Topic 9= 11 days/February-March
Unit Title: Count Numbers to 20	

Grade Level: Kindergarten

CCSS Addressed: K.CC.A.2, K.CC.A.3, K.CC.B.5

- K.CC.A.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
- K.CC.A.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
- K.CC.B.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

Topic 9 Summary

Essential Questions:

- Why can you show the same number of objects in different ways?
- How can the parts of a number be written as a number sentence?

Enduring Understandings:

- There is more than one way to show a number.
- Joining parts to make a whole is one interpretation of addition. Addition number sentences using + and = can be used to show parts of a whole.

Learning Targets

Students will be able to understand:

- 9.1 Making 4 and 5
- 9.2 Writing Number Sentences for 4 and 5
- 9.3 Making 6 and 7
- 9.4 Writing Numbers Sentences for 6 and 7
- 9.5 Making 8 and 9
- 9.6 Writing Number Sentences for 8 and 9
- 9.7 Making 10
- 9.8 Writing Number Sentences for 10

Students will be able to demonstrate:

- Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.
- Describe and compare measurable attributes.

Content Area: Math Topic 10	Topic 10 = 12 days/March
Unit Title: Compose and Decompose Numbers 11 to 19	
Grade Level: Kindergarten	
CCSS Addressed: K.NBT.A.1	
• K.NBT.1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	
Topic 10 Summary	
Essential Questions: • How can you add 1 ten and some ones to make numbers from 11 to 19? • How can we break the numbers 11-19 into parts?	Enduring Understandings: • Numbers from 11-19 can be represented as the sum of 10 and some more. • The numbers 11, 12, and 13 can be decomposed as the sum of ten and some ones. • The numbers 14, 15, and 16 can be decomposed as the sum of ten and some ones. • The numbers 17, 18, and 19 can be decomposed as the sum of ten and some ones. • Good math thinkers look for patterns in math to help solve problems.
Learning Targets	
Students will be able to understand: • 10.1 Make 11,12, and 13 • 10.2 Make 14,15 and 16 • 10.3 Make 17,18 and 19 • 10.4 Find parts of 11,12 and 13 • 10.5 Find parts of 14, 15, and 16 • 10.6 Find parts of 17, 18, and 19 • 10.7 Look for and use structure	Students will be able to demonstrate: • Use drawings and equations to make the numbers 11, 12, and 13. • Make the numbers 14, 15, and 16. • Make the numbers 17, 18, and 19. • Find parts of the numbers 11, 12, and 13. • Find parts of the numbers 14, 15, and 16. • Find parts of the numbers 17, 18, and 19. • Use patterns to make and find the parts of numbers to 19.

Content Area: Math Topic 11	Topic 11= 12 days/March
Unit Title: Count numbers to 100.	
Grade Level: Kindergarten	
CCSS Addressed: K.CC.A.1, K.CC.A.2,	
● K.CC.A.1 Count to 100 by ones and by tens. ● K.CC.A.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	

Topic 11 Summary	
Essential Questions: ● How do you count to 100?	Enduring Understandings: ● Counting patterns can be seen on a hundred chart in both the rows and the columns. Some patterns can also be heard when counting aloud. ● Decade numbers such as 10, 20, ….100 are used to name groups of ten. You can count by tens to 100 by counting only the decade numbers. ● You can also count by ones to 100. ● Numbers are counted and written in a specific sequence on a hundred chart. ● Using counting patterns on the hundred chart can help when counting on from any number from 1 to 100. ● Good math thinkers look for patterns in math to solve problems.
Learning Targets	
Students will be able to understand: ● 11.1 Count using patterns to 30 ● 11.2 Count using patterns to 50 ● 11.3 Count by tens to 100 ● 11.4 Count by tens and ones ● 11.5 Count forward from any number to 100 ● 11.6 Count using patterns to 100 ● 11.7 Look for and use structure	Students will be able to demonstrate: ● Use patterns to count to 30. ● Use patterns to count to 50. ● Skip count by tens to 100. ● Count to the number 100 by using tens and ones. ● Count forward from any number to 100 by ones. ● Count by tens and ones from any number up to 100. ● Count on from any number counting by tens and by ones.
Content Area: Math Topic 12	Topic 12= 11 days/April
Unit Title: Identify and describe shapes	
Grade Level: Kindergarten	

CCSS Addressed: K.G.A.1, K.G.A.2, K.G.A.3,

- K.G.A.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.
- K.G.A.2 Correctly name shapes regardless of their orientations or overall size.
- K.G.A.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").

Topic 12 Summary

Essential Questions:

- How can shapes be named and described?

Enduring Understandings:

- Objects have shape. Some objects, such as a sheet of paper or a photograph, are two-dimensional, or flat, shapes. Some objects, such as a ball, can, box, or jar, are three-dimensional, or solid, shapes.
- A circle is round and does not have any corners (vertices).
- A triangle has 3 sides and 3 corners (vertices).
- Flat shapes called rectangles have 4 sides and 4 vertices that look the same. A rectangle looks like a door.
- Squares are special rectangles because their sides are all the same length.
- Six-sided shapes are called hexagons. These shapes can be found in objects made by people amd in nature.
- Spheres, cylinders, cones and cubes are solid figures. Many everyday objects closely approximate these figures.
- Objects have shape. Some objects look like flat shapes or solid shapes, including squares, rectangles, triangles, circles, hexagons, spheres, cubes, cylinders, and cones.
- The positions of objects in relation to surrounding objects can be described using words such as *above, below, beside, in front of, behind, and next to*.
- Good math thinkers are careful about what they write and say, so their ideas about math are clear.

Learning Targets

Students will be able to understand:

- 12.1 Two-dimensional (2-D) and three-dimensional (3-D) shapes
- 12.2 Circles and triangles
- 12.3 Squares and other rectangles

Students will be able to demonstrate:

- Name shapes as flat or solid.
- Identify and describe circles and triangles.
- Identify and describe squares and other rectangles.

• 12.4 Hexagons • 12.5 Solid figures • 12.6 Describe shapes in the environment • 12.7 Describe the position of shapes in the environment • 12.8 Precision	• Describe and identify hexagons. • Describe and identify solid figures. • Describe shapes in the environment. • Describe positions of shapes in the environment. •
Content Area: Math Topic 13	Topic 13= 10 days/April-May
Unit Title: Analyze, Compare, and Create Shapes	
Grade Level: Kindergarten	
CCSS Addressed: K.G.A.3, K.G.B.4,K.G.B.5, K.G.B.6,	
• K.G.A.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid"). • K.G.B.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length). • K.G.B.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes. • K.G.B.6 Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle*?"	

Topic 13 Summary	
Essential Questions: • How can shapes be analyzed, compared and created?	Enduring Understandings: • 2-D shapes can be sorted and identified by their attributes. • Objects shaped like spheres, cones, and cylinders can roll. • Objects shaped like cubes, cones, and cylinders can stack and slide. • The flat surfaces of many solid figures have specific 2-D shapes. • Good math thinkers know what the problem is about. They have a plan to solve it. They keep trying if they get stuck. • You can make 2-D shapes by putting together two or more 2-D shapes. • When building a given 2-D shape, the shape must exhibit all of the attributes of the shape. • 3-D shapes can be combined to make other 3-D shapes.
Learning Targets	
Students will be able to understand: • 13.1 Analyze and compare two-dimensional (2-D) shapes • 13.2 Analyze and compare three-dimensional (3-D) shapes • 13.3 Compare 2-D and 3-D shapes • 13.4 Make sense and persevere • 13.5 Make 2-D shapes from other 2-D shapes • 13.6 Build 2-D shapes • 13.7 Build 3-D shapes	Students will be able to demonstrate: • Analyze and compare 2-D shapes. • Analyze and compare 3-D shapes. • Analyze and compare 2-D and 3-D shapes. • Analyze, compare, and make different 2-D and 3-D shapes using math. • Make 2-D shapes using other 2-D shapes. • Build 2-D shapes that match given attributes. • Use materials to build 3-D shapes.
Content Area: Math Topic 14	Topic 14= 8 days/May
Unit Title: Describe and Compare Measurable Attributes	

Grade Level: Kindergarten

CCSS Addressed: K.MD.A.1, K.MD.A.2,

- K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
- K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. *For example, directly compare the heights of two children and describe one child as taller/shorter*.

Topic 14 Summary

Essential Questions:

- How can objects be compared and ordered?

Enduring Understandings:

- When you compare by length or height, you are thinking about how long or tall objects are. Objects can be compared by length or height to see which is longer/taller and which is shorter.
- When you compare by capacity, you are thinking about how much objects hold. Objects can be compared by capacity to see which holds more and which holds less.
- When you compare by weight, you are thinking about how heavy objects are. Objects can be compared by weight to see which is heavier and which is lighter.
- Objects have measurable attributes that can be recognized and described.
- Good math thinkers are careful about what they write and say, so their ideas about math are clear.

Learning Targets

Students will be able to understand:

- 14.1 Compare by length and height
- 14.2 Compare by capacity
- 14.3 Compare by weight
- 14.4 Describe objects by attributes
- 14.5 Describe objects by measurable attributes
- 14.6 Precision

Students will be able to demonstrate:

- Compare objects by length and height.
- Compare objects by capacity.
- Compare objects by weight. Use attributes to describe different objects.
- Use words to describe how an object can be measured.
- Solve math problems with measurable attributes by using precision.

Assessments

Benchmark:

- EnVision Math 2.0 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.

- Math centers
- Guided Practice
- Reteach Practice
- Daily Common Core Review
- Independent Practice
- Small group activities
- Exit tickets

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

Alternative Assessments:

- Teacher Observations
- Patterns
- Homework
- Morning calendar
- SmartBoard activities

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: *Students demonstrate a sound understanding of technology concepts, systems and operations.*	
Grade Level bands	Content Statement Students will:	Indicator
P	Understand and use technology systems.	8.1.P.A.1 Use an input device to select an item and navigate the screen
		8.1.P.A.2 Navigate the basic functions of a browser.
	Select and use applications effectively and productively.	8.1.P.A.3 Use digital devices to create stories with pictures, numbers, letters and words.
		8.1.P.A.4 Use basic technology terms in the proper context in conversation with peers and teachers (e.g., camera, tablet, Internet, mouse, keyboard, and printer).
		8.1.P.A.5 Demonstrate the ability to access and use resources on a computing device.
K-2	Understand and use technology systems.	8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.

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

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

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

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

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

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

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

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

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

Content Area	Technology

Standard	8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Strand	B. Technology and Society: *Knowledge and understanding of human, cultural and societal values are fundamental when designing technological systems and products in the global society.*

Grade Level bands	Content Statement Students will be able to understand:	Indicator	Indicator
K-2	The cultural, social, economic and political effects of technology.	8.2.2.B.1	Identify how technology impacts or improves life.
	The effects of technology on the environment.	8.2.2.B.2	Demonstrate how reusing a product affects the local and global environment.
	The role of society in the development and use of technology.	8.2.2.B.3	Identify products or systems that are designed to meet human needs.
	The influence of technology on history.	8.2.2.B.4	Identify how the ways people live and work has changed because of technology.

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

	The effects of technology on the environment.	8.2.8.B.3	Research and analyze the ethical issues of a product or system on the environment and report findings for review by peers and /or experts.
		8.2.8.B.4	Research examples of how humans can devise technologies to reduce the negative consequences of other technologies and present your findings.
	The role of society in the development and use of technology.	8.2.8.B.5	Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries and societies.
		8.2.8.B.6	Compare and contrast the different types of intellectual property including copyrights, patents and trademarks.
	The influence of technology on history.	8.2.8.B.7	Analyze the historical impact of waste and demonstrate how a product is upcycled, reused or remanufactured into a new product.

Content Area	Technology
Standard	8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Strand	C. Design: *The design process is a systematic approach to solving problems.*

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

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

	The application of engineering design.	8.2.8.C.5	Explain the interdependence of a subsystem that operates as part of a system.
		8.2.8.C.5.a	Create a technical sketch of a product with materials and measurements labeled.
	The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.	8.2.8.C.6	Collaborate to examine a malfunctioning system and identify the step-by-step process used to troubleshoot, evaluate and test options to repair the product, presenting the better solution.
		8.2.8.C.7	Collaborate with peers and experts in the field to research and develop a product using the design process, data analysis and trends, and maintain a design log with annotated sketches to record the developmental cycle.
		8.2.8.C.8	Develop a proposal for a chosen solution that 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: 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: *The designed world is the product of a design process that provides the means to convert resources into products and systems.*

Grade Level bands	Content Statement Students will understand how to:	Indicator	Indicator

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

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

Content Area	Technology
Standard	8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Strand	E. Computational Thinking: Programming: *Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.*

Grade Level bands	Content Statement Students will be able to understand:	Indicator	Indicator
K-2	Computational thinking and computer programming as tools used in design and engineering.	8.2.2.E.1	List and demonstrate the steps to an everyday task.
		8.2.2.E.2	Demonstrate an understanding of how a computer takes input through a series of written commands and then interprets and displays information as output.
		8.2.2.E.3	Create algorithms (a sets of instructions) using a pre-defined set of commands (e.g., to move a student or a character through a maze).
		8.2.2.E.4	Debug an algorithm (i.e., correct an error).

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

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

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

Differentiation Strategies

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

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

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

	to get there.
Multiple texts	The teacher obtains or creates a variety of texts at different reading levels to assign strategically to students.
Alternative assessments	After completing a learning experience via the same content or process, the student may have a choice of products to show what has been learned. This differentiation creates possibilities for students who excel in different modalities over others (verbal versus visual).
Modified Assessments	Assessments can be modified in a variety of ways – for example by formatting the document differently (e.g. more space between questions) or by using different types of questions (matching vs. open ended) or by asking only the truly essential questions.
Literature circles	Flexible grouping of students who engage in different studies of a piece of literature. Groups can be heterogeneous and homogeneous.
Learning Centers	A station (or simply a collection of materials) that students might use independently to explore topics or practice skills. Centers allow individual or groups of students to work at their own pace. Students are constantly reassessed to determine which centers are appropriate for students at a particular time, and to plan activities at those centers to build the most pressing skills.
Tic-Tac-Toe Choice Board	The tic-tac-toe choice board is a strategy that enables students to choose multiple tasks to practice a skill, or demonstrate and extend understanding of a process or concept. From the board, students choose (or teacher assigns) three adjacent or diagonal. To design a tic-tac-toe board: - Identify the outcomes and instructional focus - Design 9 different tasks - Use assessment data to determine student levels - Arrange the tasks on a tic-tac-toe board either randomly, in rows according to level of difficulty, or you may want to select one critical task to place in the center of the board for all students to complete.

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

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

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

Classroom Modifications for E.L.L.	
PACING: ● Extend time requirements ● Omit assignments	PRESENTATION OF SUBJECT MATERIAL: ● Use individual/small group instruction ● Use specialized curriculum ● Simplify language ● Tape lectures for playback ● Demonstrate concepts ● Use manipulatives ● Emphasize critical information ● Use graphic organizers ● Pre-teach vocabulary
ENVIRONMENT: ● Assign preferential seating ● Assign peer buddy	MATERIALS: ● Provide taped textbooks ● Highlight textbooks/study guides ● Use supplementary materials ● Give assistance in note taking ● Type handwritten teacher materials ● Use bilingual dictionaries, language learner dictionaries and electronic translators ● Use adapted/modified textbooks Allow use of computer/word processor
REINFORCEMENT AND FOLLOW THROUGH: ● Use positive reinforcement ● Use concrete reinforcement ● Check often for understanding/review ● Arrange for peer tutoring	TESTING ADAPTATIONS; ● Allow students to answer orally ● Use multiple-choice format ● Read test to student ● Modify format

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

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

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

Accommodations for English Language Learners General Classroom and Content Areas
MATH: • At beginning to intermediate levels of proficiency, English Language Learners should be shown examples of a completed assignment to model the correct format. • Assignments and directions should be printed on the board along with cursive representation. • A bilingual assistant/interpreter, when available, could be used to explain math concepts in the student's primary language. • Students should have access to counters, number lines and other types of manipulatives, which enable them to complete assignments at their level of instruction. • Rewrite story problems in simpler English. Use short sentences, pictures, and illustrations to encourage understanding. • Show students how to prepare a card file of number words. Write the word on one side and the symbol on the opposite side. SOCIAL STUDIES • Allow beginning and advanced beginning students to use drawings to demonstrate knowledge of concepts. • Show English Language Learners at all proficiency levels a model of a project/assignment prior to their completing the assignment. • Teach the key concepts while limiting the vocabulary and details in the lesson. • Test only those key concepts addressed. • Use many visual aids during the instruction process; i.e. overhead transparencies, maps, graphic organizers, puzzles, computer, etc.

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

READING

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

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

SCIENCE

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

WRITING

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

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

student.

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

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

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

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

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

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

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

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

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

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

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

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

A. Setting Accommodations	B. Scheduling Accommodations	C. Test Materials Modifications
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	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.	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.

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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