Branchburg Township Public Schools

Office of Curriculum and Instruction

Grade 4 Math Curriculum

Adopted by the Board of Education September 2023

This curriculum is aligned with the 2016 New Jersey Student Learning Standards in Mathematics

Curriculum Scope and Sequence			
Content Area	Math	**Course Title/Grade Level:**	4th Grade

Topic Name		Suggested Pacing (Days/Weeks)
Topic #1	Launch/Generalize Place Value	15-20 Days/8 Days
Topic #2	Fluently Add and Subtract Multi-Digit Whole Numbers	9 Days
Topic #3	Use Strategies and Properties to Multiply by 1-Digit Numbers	9 Days
Topic #4	Use Strategies and Properties to Multiply by 2-Digit Numbers	8 Days
Topic #5	Use Strategies and Properties to Divide by 1-Digit Numbers	11 Days
Topic #6	Use Operations with Whole Numbers to Solve Problems	7 Days
Topic #7	Factors and Multiples	6 Days
Topic #8	Extend Understanding of Fraction Equivalence and Ordering	11 Days
Topic #9	Understand Addition and Subtraction of Fractions	11 Days
Topic #10	Extend Multiplication Concepts to Fractions	6 Days
Topic #11	Represent and Interpret Data on Line Plots	5 Days
Topic #12	Understand and Compare Decimals	7 Days
Topic #13	Measurement: Find Equivalence in Units of Measure	8 Days
Topic #14	Algebra: Generate and Analyze Patterns	5 Days
Topic #15	Geometric Measurement: Understand Concepts of Angles and Angle Measurement	7 Days
Topic #16	Lines, Angles, Shapes	10 Days

Topic 1 Title	Launch/Generalize Place Value Understanding	Approximate Pacing	15 Days/8 Days

STANDARDS

NJSLS (Math)

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 ÷ 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

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them.
Students persevere as they try to understand problems involving place value, plan how to solve them, and consider whether their answers make sense.

2. Reason abstractly and quantitatively.
Students use quantitative reasoning to analyze relationships between place value positions to compare numbers.

3. Construct viable arguments and critique the reasoning of others.
Students critique the reasoning of others when looking at problems to justify the values of digits in whole numbers.

4. Model with mathematics.
Students model with math when they represent the place value of whole numbers.

5. Use appropriate tools strategically.
Students use tools such as number lines to represent numbers and help round numbers.

6. Attend to precision.
Students attend to precision as they use and explain place value.

7. Look for and make use of structure.
Students use structure when they apply place value relationships to read and write numbers.

8. Look for and express regularity in repeated reasoning.
Students use repeated reasoning when they analyze patterns in the first three periods of the place-value chart and make generalizations.

Interdisciplinary Connections:	CS & DT:
RI.4.4. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.	Computer networks can be used to connect individuals to other individuals, places, information, and ideas. The Internet enables individuals to connect with others worldwide.

Example- Students will learn and use vocabulary words such as conjecture, when solving word problems and having an explanation.	8.1.2.NI.1: Model and describe how individuals use computers to connect to other individuals, places, information, and ideas through a network. *Example: Students use various websites and platforms to practice their math skills and communicate their learning during math workshop with technology daily (enVisions, ALEKS, Flipgrid, etc)*
CLKS:	
There are specific steps associated with creating a budget. 9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions. Saving money can impact an individual's ability to address emergencies and accomplish their short-and long-term goals. 9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate). *Example: In lesson 1-1, students solve word problems involving spending and saving money.*	
UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS	
Enduring Understandings: ● 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. ● 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. ● Place value can be used to compare numbers. ● Rounding whole numbers is a process for finding the multiple of 10, 100, and so on closest to a given number. ● Good math thinkers use math to explain why they are right. They can talk about the math that others do, too.	
Essential Questions: ● How are greater numbers written? ● What are some ways to write numbers to one million? ● How are place values related to each other? ● How can whole numbers be compared? ● How can you round numbers? ● How can you construct arguments?	
STUDENT LEARNING OBJECTIVES	
Key Knowledge	**Process/Skills/Procedures/Application of Key Knowledge**

Students will know:	***Students will be able to:***
Digit Value Place Period Ones period Thousands period Millions period Place value Ones place Tens place Hundreds place Thousands place Ten-thousands place Hundred-thousands place One-millions place Ten-millions place Hundred-millions place Number names Numerals Expanded form Number name Compare Greater than symbol (>) Less than symbol (<) Least to greatest Greatest to least Rounding Number line Halfway point Conjecture Argument Justify	● Read and write numbers through one million in expanded form, with numerals, and using number names. ● Recognize the relationship between adjacent digits in a multi-digit number. ● Use place value to compare multi-digit whole numbers. ● Use place value to round multi-digit numbers. ● Use previously learned concepts and skills to construct arguments about place value.
ASSESSMENT OF LEARNING	

Summative Assessment (Assessment at the end of the learning period)	• Readiness Assessment • Topic 1 Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16
RESOURCES	
Core instructional materials: enVision Teacher Manual Volume 1 enVision Student Edition Volume 1 enVision Additional Practice Book ALEKS	
Supplemental materials: Leveled worksheets Guided Math-Place Value Kit Additional Resources on Drive	
Modifications for Learners	
See appendix	

Topic/Unit 2 Title	Fluently Add and Subtract Multi-Digit Whole Numbers	Approximate Pacing	9 Days
STANDARDS			
NJSLS (Math)			
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.			
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.			
Standards for Mathematical Practice **1. Make sense of problems and persevere in solving them.** Students make sense of problems involving operations with whole numbers, place how to solve them, determine if their solutions make sense, persevere in solving them, and consider whether their answers make sense. **2. Reason abstractly and quantitatively.** Students use quantitative reasoning as they solve problems involving multi-digit whole numbers. **3. Construct viable arguments and critique the reasoning of others.** Students construct arguments to justify solutions to problems involving whole numbers. **4. Model with mathematics.** Students model with math when they use bar diagrams and equations to represent problems involving whole numbers. **5. Use appropriate tools strategically.**			

Students use tools such as drawings or place-value blocks to solve problems involving whole numbers.
6. Attend to precision.
Students attend to precision when using mental math to find the solutions to problems involving whole numbers.
7. Look for and make use of structure.
Students use structure when they apply place value relationships and properties of operations to find solutions.
8. Look for and express regularity in repeated reasoning.
Students use repeated reasoning when they generalize properties of operations to solve problems involving whole numbers.

Interdisciplinary Connections:	**CS & DT:**
SL.4.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly. *Example- During the solve and share, students participate in discussions about strategies they use to solve problems.*	8.1.5.AP.4: Break down problems into smaller, manageable sub-problems to facilitate program development. *Example- Students use associative property, commutative property, or identify properties to solve problems.*

CLKS:

An individual's financial traits and habits affect his/her finances.
9.1.5.FP.1: Illustrate the impact of financial traits on financial decisions.
9.1.5.FP.2: Identify the elements of being a good steward of money. Spending choices and their intended and unintended consequences impact financial outcomes and personal wellbeing.
9.1.5.FP.3: Analyze how spending choices and decision-making can result in positive or negative consequences.
9.1.5.FP.4: Explain the role of spending money and how it affects wellbeing and happiness (e.g., "happy money," experiences over things, donating to causes, anticipation, etc.).
Example: Students solve word problems involving saving and spending money. Students want to think about the amount of money they start with, how much an item is, determine if they have enough, and determine how much would be left over.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

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 is helpful for checking to see if an answer is reasonable or to find an approximate answer when an exact answer is not necessary.

- The standard algorithm for adding 3-digit numbers is an extension to the standard algorithm for adding 2-digit numbers.
- The standard addition algorithm for multi-digit numbers breaks the calculation into simpler calculations using place value. The standard subtraction algorithm for multi-digit numbers is an efficient strategy that can be used to subtract any two numbers. The calculations are done by place value starting with the ones, then the tens, and so on, regrouping as needed.
- The standard algorithm for subtraction breaks 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.

Essential Questions:

- How can you use mental math to solve problems?
- How can sums and differences of whole numbers be estimated?
- What are standard procedures for adding and subtraction whole numbers?
- How do you add whole numbers efficiently?
- How do you add greater numbers?
- How do you subtract whole numbers efficiently?
- How do you subtract greater numbers efficiently?
- How do you subtract across zeros?
- How can you use quantitative reasoning to solve problems?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
Students will know: Digit Place Value Addends Sum Difference Estimate Reasonable Round Commutative Property of Addition Associative Property of Addition Identity Property of Addition	***Students will be able to:*** ● Add and subtract whole numbers mentally using a variety of methods. ● Round greater whole numbers to estimate sums and differences. ● Add 3-digit numbers using place-value concepts and the standard algorithm. ● Add numbers to one million with and without regrouping using the standard algorithm. ● Use place value and the standard algorithm to subtract whole numbers. ● Use number sense and regrouping to subtract across zeros.

Count up Count down Compensation Regroup Bar diagram Variable Equation Expression Algorithm Standard Algorithm Partial Sums Inverse Operations Quantities Hidden Question	• Use previously learned concepts and skills to reason abstractly and make sense of quantities and their relationships in problem situations.
ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	• Topic 2 Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16

RESOURCES
Core instructional materials: enVision Teacher Manual Volume 1 enVision Student Edition Volume 1 enVision Additional Practice Book ALEKS
Supplemental materials: Leveled worksheets Guided Math-Place Value Kit Additional Resources on Drive
Modifications for Learners
See appendix

Topic/Unit 3 Title	Use Strategies and Properties to Multiply by 1-Digit Numbers	Approximate Pacing	9 Days
STANDARDS			
NJSLS (Math)			
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.			
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.			

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.

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them.
Students make sense of problems related to multiplication, persevere in solving them, and consider whether their answers make sense.

2. Reason abstractly and quantitatively.
Students use quantitative reasoning as they use place value and estimation when multiplying and check their answers for reasonableness.

3. Construct viable arguments and critique the reasoning of others.
Students construct arguments to justify their solutions to multiplication problems.

4. Model with mathematics.
Students model with math when they use arrays and partial products to multiply.

5. Use appropriate tools strategically.
Students use tools such as place-value blocks or drawings to solve multiplication problems.

6. Attend to precision.
Students attend to precision when finding products.

7. Look for and make use of structure.
Students look for structure by analyzing multiplication equations.

8. Look for and express regularity in repeated reasoning.
Students use repeated reasoning when they use strategies to multiply.

Interdisciplinary Connections:	**CS & DT:**
W.4.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly. D. Use precise language and domain-specific vocabulary to inform about or explain the topic. *Example: In lesson 3-2's problem solving, students use a bar graph to solve questions about the number of votes and construct arguments about the patterns they can use to solve for it.*	8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim. *Example: In lesson 3-2's problem solving, students use a bar graph to solve questions about the number of votes and construct arguments about the patterns they can use to solve for it.*

CLKS:

9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).

Example- Students will be working in small groups to play a game that practices multiplying with multi digit numbers. Many jobs are asking employees to work in cooperative groups to complete projects. The skills learned during game play help students to work together, solve problems, and settle disagreements. An example of a job that requires teamwork might be a marketing professional who needs to meet with a group to design the new campaign for their client's product. Multiple ideas would be provided and a common consensus would need to be reached.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

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 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.
- Area models and properties of multiplication can be used to simplify computation.
- 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.
- Properties of multiplication and place-value understanding can be used to multiply without paper and pencil.
- Students can use the Distributive Property, area models, and other methods to find a product.
- Good math thinkers choose and apply math they know to show and solve problems from everyday life.

Essential Questions:

- How can you multiply by multiples of 10, 100, and 1,000?
- How can you estimate when you multiply?
- How can you use an array and partial products to multiply?
- How can you use an area model and partial products to multiply?
- How can you multiply whole numbers?
- How do you multiply with greater numbers?
- How can you multiply mentally?
- How can you represent a situation with a math model?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge

Students will know:	***Students will be able to:***
Associative Property of Multiplication Numerical expression Distributive Property Compensation Commutative Property of Multiplication Partial products Row Column Array Area Model Factors Product Basic fact Place Value Estimate Rounding Reasonable Equation	• 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 arrays and partial products to multiply 2- and 3-digit numbers by 1-digit numbers. • Use area models and the Distributive Property to multiply greater numbers. • Use place value and partial products to multiply 3- and 4-digit numbers by 1-digit numbers. • Use place value and properties of operations to multiply mentally. • Choose an appropriate strategy to multiply 2-, 3-, and 4-digit numbers by 1-digit numbers. • Use previously learned skills to represent and solve problems.

ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	• Topic 3 Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions)

demonstrate their knowledge, understanding and proficiency)	• modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16
RESOURCES	
Core instructional materials: enVision Teacher Manual Volume 1 enVision Student Edition Volume 1 enVision Additional Practice Book ALEKS	
Supplemental materials: Leveled worksheets Additional Resources on Drive	
Modifications for Learners	
See appendix	

Topic/Unit 4 Title	Use Strategies and Properties to Multiply by 2-Digit Numbers	Approximate Pacing	8 Days
STANDARDS			
NJSLS (Math)			
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.			
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.			
4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.			
Standards for Mathematical Practice **1. Make sense of problems and persevere in solving them.** Students make sense of problems involving multiplication, persevere in solving them, and consider whether their answers make sense. **2. Reason abstractly and quantitatively.** Students use quantitative reasoning to estimate and perform mental math in problems involving multiplication with 2-digit numbers. **3. Construct viable arguments and critique the reasoning of others.** Students construct arguments to justify and explain their process and solutions. **4. Model with mathematics.** Students model with math when they use arrays and equations to represent multiplication. **5. Use appropriate tools strategically.** Students use tools, such as grid paper or place-value blocks, to multiply by a multiple of 10. **6. Attend to precision.** Students attend to precision when calculating solutions. **7. Look for and make use of structure.** Students use structure when they explain how the rows and columns of an array are related to multiplication. **8. Look for and express regularity in repeated reasoning.** Students generalize when they use the Distributive Property to find and record products.			

Interdisciplinary Connections:	CS & DT:
SL.4.3. Identify the reasons and evidence a speaker provides to support particular points. *Example: Students use various strategies such as area models, partial products, and/or the distributive property to solve for 2-digit multiplication.*	9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3) *Example: Students use various strategies such as area models, partial products, and/or the distributive property to solve for 2-digit multiplication.*

CLKS:

9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations.
Example: Students use area models to determine the area for playgrounds. Contractors, interior decorators, architects, etc. use the knowledge of area when designing houses, buildings, etc.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

Enduring Understandings:

- Basic facts and place-value patterns can be used to mentally multiply a 2-digit number by a multiple of 10.
- Place-value blocks, area models, and arrays provide ways to visualize and find products.
- Products of 2-digit by 2-digit numbers can be estimated by replacing factors with other numbers that are close and easy to multiply mentally or by replacing each factor with the closest multiple of 10.
- 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 four 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.
- Good math thinkers make sense of problems and think of ways to solve them. If they get stuck, they do not give up.

Essential Questions:

- How can you multiply by multiples of 10?
- What strategies can you use when estimating the product?
- How can you use an array or an area model to multiply?
- How can you use the Distributive Property to multiply?
- How can you record multiplication?

- How can you use multiplication to solve problems?
- How can you make sense of and persevere in solving problems with more than one step?

STUDENT LEARNING OBJECTIVES	
Key Knowledge	**Process/Skills/Procedures/Application of Key Knowledge**
Students will know: Compatible numbers Distributive Property Basic fact Multiple Row Column Array Area Model Factors Product Partial products Sum Regroup Place Value Estimate Rounding Reasonable Equation Variable Expression Quantities	***Students will be able to:*** ● Use mental math strategies to multiply 2-digit multiples of 10 by 2-digit multiples of 10. ● Use models and properties of operations to multiply 2-digit numbers by multiples of 10. ● Use rounding or compatible numbers to estimate products of two 2-digit numbers. ● Use arrays, place value, partial products, and properties of operations to multiply two 2-digit numbers. ● Use the Distributive Property and an area model to multiply two 2-digit numbers. ● Use place value and partial products to calculate products of 2-digit by 2-digit multiplication problems. ● Make sense of problems and persevere in solving them.

ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	● Topic 4 Online Assessment
Formative Assessments (Ongoing assessments during	● Quick Checks

the learning period to inform instruction)	• Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16
RESOURCES	
Core instructional materials: enVision Teacher Manual Volume 1 enVision Student Edition Volume 1 enVision Additional Practice Book ALEKS	
Supplemental materials: Leveled worksheets Guided Math-Place Value Kit Additional Resources on Drive	
Modifications for Learners	
See appendix	

Topic/Unit 5 Title	Use Strategies and Properties to Divide by 1-Digit Numbers	Approximate Pacing	11 Days
STANDARDS			
NJSLS (Math)			
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.			
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.			
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.			
Standards for Mathematical Practice: **1. Make sense of problems and persevere in solving them.** Students make sense of problems involving division of whole numbers, persevere in solving them, and consider whether their answers make sense. **2. Reason abstractly and quantitatively.** Students use quantitative reasoning as they estimate and perform mental math to divide whole numbers. **3. Construct viable arguments and critique the reasoning of others.** Students construct arguments to justify solutions to problems involving estimation and whole-number division. **4. Model with mathematics.** Students model with math when they use drawings and equations to represent division situations. **5. Use appropriate tools strategically.** Students use tools, such as place-value drawings or money, to represent division problems. **6. Attend to precision.** Students attend to precision when they use symbols, numbers, or drawings to solve problems involving division of whole numbers. **7. Look for and make use of structure.**			

Students use structure when they apply the relationship between multiplication and division to solve problems.
8. Look for and express regularity in repeated reasoning.

Interdisciplinary Connections:	CS & DT:
SL 4.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly. *Example- Students share and discuss possible strategies to use to solve division word problems. Students connect ideas and enhance their own work.*	Computer networks can be used to connect individuals to other individuals, places, information, and ideas. The Internet enables individuals to connect with others worldwide. 8.1.2.NI.1: Model and describe how individuals use computers to connect to other individuals, places, information, and ideas through a network. 8.1.2.NI.2: Describe how the Internet enables individuals to connect with others worldwide. *Example- Students create boards on Discovery Education or Flip Grid to share strategies that work best for them while solving division problems.*

CLKS:

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process
9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global
Example- Students are asked to divide using partial quotients. This requires students to make sense of problems and persevere in solving them. Many employers require employees to problem solve either independently or with a group. Perseverance is a skill needed by all adults and one student needs to actively practice. An example is a doctor who needs to do multiple tests to diagnose a patient. The doctor needs to persevere in finding the solution to a problem.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

Enduring Understandings:

- Basic facts and place value patterns can be used to divide multiples of 10 and 100 by 1-digit numbers.
- There is more than one way to estimate a quotient. Using place value patterns and substituting compatible numbers are both efficient techniques for estimating quotients.
- When one is dividing, the remainder must be less than the divisor. When one is solving a real-world problem, the kind of question asked determines how to interpret the remainder.
- Division with partial quotients involves breaking apart the dividend, dividing the parts, and adding the partial quotients.

- Sharing is one way to think about division.
- You can use estimation and place value to divide.
- There are many ways to perform division, including mental math, models, partial quotients, and sharing.
- Good thinkers choose and apply math they know to show and solve problems in everyday life.

Essential Questions:

- How can mental math be used to divide?
- How can you estimate quotients using patterns and place value?
- How can you estimate quotients to solve problems?
- After dividing, what do you do with the remainder?
- How can you use partial quotients to solve division problems with greater dividends?
- How can place value help you divide?
- How can you record division with a 1-digit divisor?
- How do you choose a strategy to divide?
- How can the steps for dividing be explained?
- How can you apply math you know to solve problems?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
Students will know: Equation Variables Divide Divisor Dividend Quotient Partial quotients Equal groups Remainder Basic fact Place value Compatible numbers Estimate Rounding	***Students will be able to:*** ● Use mental math and place-value strategies to divide multiples of 10 and 100 by 1-digit divisors. ● 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 partial quotients to divide. ● Use partial quotients and place-value understandings to divide with greater dividends. ● Use place value and models to divide 2- and 3-digit numbers by 1-digit numbers. ● Choose a strategy to divide that follows a series of steps to break division into simpler calculations. ● Use previously learned concepts and skills to model and solve problems.

Reasonableness Hidden questions Operation Bar diagram	
ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	• Topic 5 Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16
RESOURCES	
Core instructional materials: enVision Teacher Manual Volume 1 enVision Student Edition Volume 1 enVision Additional Practice Book ALEKS	
Supplemental materials: Leveled worksheets Guided Math-Place Value Kit	

Additional Resources on Drive
Modifications for Learners
See appendix

Topic/Unit 6 Title	Use Operations with Whole Numbers to Solve Problems	Approximate Pacing	7 Days
STANDARDS			
NJSLS (Math)			
4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 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.			
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.			
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.			
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.			
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.			
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.			
Standards for Mathematical Practice: **1. Make sense of problems and persevere in solving them.** Students make sense of problems involving multi-step problems, persevere in solving them, and consider whether their answers make sense. **2. Reason abstractly and quantitatively.**			

Students use quantitative reasoning as they solve multi-step problems involving multi-digit numbers and more than one operation.
3. Construct viable arguments and critique the reasoning of others.
Students critique the reasoning of others when looking at problems involving whole-number multiplicative comparisons.
4. Model with mathematics.
Students model with math when they use bar diagrams and equations to represent problems involving multiplicative comparison.
5. Use appropriate tools strategically.
Students use tools, such as bar diagrams and equations, to represent and solve comparison problems involving whole numbers.
6. Attend to precision.
Students attend to precision when solving multi-step problems.
7. Look for and make use of structure.
Students use structure when they apply relationships and properties of operations to comparison situations.
8. Look for and express regularity in repeated reasoning.

Interdisciplinary Connections:	**CS & DT:**
W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. *Example- When solving for the solve and shares, students are asked to gather information from the first step of the word problem in order to help them solve the second step.*	8.1.5.AP.4: Break down problems into smaller, manageable sub-problems to facilitate program development. *Example: Students solve multistep problems by solving for one part before solving for the other.*

CLKS:

9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).
Example: During the topic's solve and shares, students use a strategy that works best for them when solving problems. Students discuss the strategy they used with others and compare and contrast the answer and how they reached their answer.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

Enduring Understandings:

- 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.
- Bar diagrams and equations can be used to solve problems involving multiplicative comparisons.
- Bar diagrams can also be used to model and solve multi-step problems.
- Multi-step problems can be modeled and solved in more than one way.

- Equations can represent problems, and are helpful in answering both hidden questions and the original question in a problem.
- Good thinkers make sense of problems and think of ways to solve them. If they get stuck, they don't give up.

Essential Questions:

- How is comparing with multiplication different from comparing with addition?
- How can you solve a problem involving multiplication as comparison?
- How can you use diagrams and equations to solve multi-step problems?
- How can you model and solve multi-step problems?
- How do you make sense of a multi-step problem and persevere in solving it?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
Compare Compare with addition (additive comparison) Compare with multiplication (multiplicative comparison) Comparison sentence Associative Property of Multiplication Commutative Property of Multiplication Distributive Property of Multiplication Sum Product Quotient Equation Expression Operation Variable Bar diagram Given question (original question) Hidden question Inverse operations	***Students will be able to:*** ● Interpret comparisons as multiplication or addition equations. ● Use multiplication and division to compare two quantities. ● Model and solve multi-step problems by finding hidden questions and using bar diagrams and equations. ● Model and solve multi-step problems, and check that answers are reasonable. ● Solve multi-step problems by writing and solving one or more equations. ● Make sense of a multi-step problem and keep working until it is solved.

ASSESSMENT OF LEARNING

Summative Assessment (Assessment at the end of the learning period)	• Topic 6 Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16
RESOURCES	
Core instructional materials: enVision Teacher Manual Volume 1 enVision Student Edition Volume 1 enVision Additional Practice Book ALEKS	
Supplemental materials: Leveled worksheets Guided Math-Place Value Kit Additional Resources on Drive	
Modifications for Learners	
See appendix	

Topic Unit 7 Title	Factors and Multiples	Approximate Pacing	6 Days
STANDARDS			
NJSLS (Math)			
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.			
Standards for Mathematical Practice: **1. Make sense of problems and persevere in solving them.** Students make sense of problems related to factors, persevere in solving them, and consider whether their answers make sense. **2. Reason abstractly and quantitatively.** Students use quantitative reasoning as they find factors, make arrays, and decide whether a given number is prime or composite. **3. Construct viable arguments and critique the reasoning of others.** Students critique the reasoning of others when looking at problems related to factors. **4. Model with mathematics.** Students model with math when they use equations to solve problems. **5. Use appropriate tools strategically.** Students use tools such as grid paper or tiles to find arrays. **6. Attend to precision.** Students attend to precision when using factors to find different arrangements of a set of objects. **7. Look for and make use of structure.**			

Students are required to analyze the structure of arrays when looking for factors.
8. Look for and express regularity in repeated reasoning.
Students use repeated reasoning to generalize how to solve problems related to arrays and factors.

Interdisciplinary Connections:	**CS & DT:**
RI.4.4. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area. *Example- Students learn and use the vocabulary words factor, multiple, prime number composite number.*	8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models. *Example: During 7-2's solve and share, students utilize centimeter grid paper to determine the amount of equal rows of flowers in a garden.*

CLKS:

9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
Example: Students utilize centimeter grid paper to determine the amount of equal rows of chairs when solving a word problem regarding a music performance and the best arrangement of seats for the audience.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

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 factors.
- The product of any nonzero whole number and a given nonzero whole number is a multiple of both. Factors and multiples are closely related.

Essential Questions:

- How can you use arrays to find the factor pairs of a number?
- How can you use multiplication to find the factors of a number?
- How can you use repeated reasoning to find all the factors for a number?
- How can you identify prime and composite numbers?
- How can you find multiples of a number?

STUDENT LEARNING OBJECTIVES	
Key Knowledge	**Process/Skills/Procedures/Application of Key Knowledge**
Students will know: Row Column Array Factor Factor pair Turn-around fact Multiple Product Prime number Composite number Generalize Common factors Common multiples Square number Generalize	***Students will be able to:*** ● 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 whole number.

ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	● Topic 7 Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	● Quick Checks ● Anecdotal Notes ● Math Journal ● Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	● Google Practice Sets ● Leveled worksheets/activities ● PBL (extensions) ● modified assessments as per IEPs

Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16
RESOURCES	
Core instructional materials: enVision Teacher Manual Volume 1 enVision Student Edition Volume 1 enVision Additional Practice Book ALEKS	
Supplemental materials: Leveled worksheets Guided Math-Place Value Kit Additional Resources on Drive	
Modifications for Learners	
See appendix	

Topic Unit 8 Title	Extend Understanding of Fraction Equivalence and Ordering	Approximate Pacing	11 Days
STANDARDS			
NJSLS (Math)			
4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × 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.A.2 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × 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.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.			
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.			
Standards for Mathematical Practice: **1. Make sense of problems and persevere in solving them.** Students make sense of problems related to comparing fractions, persevere in solving them, and consider whether their answers make sense. **2. Reason abstractly and quantitatively.** Students use quantitative reasoning to compare two fractions using benchmark fractions. **3. Construct viable arguments and critique the reasoning of others.** Students critique the reasoning of others when looking at problems related to comparing fractions. **4. Model with mathematics.** Students model with math when they represent equivalent fractions using a number line or fraction strips. **5. Use appropriate tools strategically.** Students use tools, such as area models or number lines, to represent equivalent fractions. **6. Attend to precision.** Students attend to precision when finding equivalent fractions using the correct unit labels.			

7. Look for and make use of structure.
Students look for structure when they compare fractions.
8. Look for and express regularity in repeated reasoning.
Students use repeated reasoning when they make generalizations while comparing fractions.

Interdisciplinary Connections:	CS & DT:
1.1.5.B.1 - Identify the elements of music in response to aural prompts and printed music notational systems. *Example- In music, notes have fractional parts. Students will be able to add or subtract the fractions to create the musical piece.*	Computer networks can be used to connect individuals to other individuals, places, information, and ideas. The Internet enables individuals to connect with others worldwide. 8.1.2.NI.1: Model and describe how individuals use computers to connect to other individuals, places, information, and ideas through a network. *Example- Students can use digital fraction manipulatives to solve word problems involving ordering fractions.*

CLKS:

9.2.5.CAP.7: Identify factors to consider before starting a business.
9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements
Example- In lesson 8-3, students must use fractions to represent a box of muffins and the number of different types of muffins. Students discuss what types of jobs may use fractional measurements.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

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 same fraction by 1. This gives an equivalent fraction because 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 greater than 1, 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 ½.
- When two fractions have the same denominator, the fraction with the greater numerator is 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 that others do, too.

Essential Questions:

- What are some ways to name the same part of a whole?
- How can you use a number line to explain why fractions are equivalent?
- How can you use multiplication to find equivalent fractions?
- How can you use division to find equivalent fractions?
- How can you use benchmarks to compare fractions?
- How can you compare fractions with unlike numerators and denominators?
- How can you construct arguments?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
Students will know: Fraction Equivalent fractions Numerator Common numerator Denominator Common denominator Factors Common factor Multiples Common multiple Compare Greater than symbol (>) Less than symbol (<) Order Benchmark fraction Unit fraction Area Model Shaded Unshaded Number line	***Students will be able to:*** ● 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.

Point Argument Counterexample Conjecture	
ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	• Topic 8 Online Assessment • Topics 1-8 Cumulative Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16
RESOURCES	
Core instructional materials: enVision Teacher Manual Volume 2 enVision Student Edition Volume 2 enVision Additional Practice Book ALEKS	
Supplemental materials: Leveled worksheets	

Guided Math-Place Value Kit Additional Resources on Drive
Modifications for Learners
See appendix

Topic Unit 9 Title	**Understand Addition and Subtraction of Fractions**	**Approximate Pacing**	**11 Days**
STANDARDS			
NJSLS (Math)			
4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.			
4.NF.B.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.			
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. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.			
4.NF.B.3c Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction			
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.			
Standards for Mathematical Practice: **1. Make sense of problems and persevere in solving them.** Students persevere as they try to understand problems involving fractions, plan how to solve them, and determine if their answers make sense.			

2. Reason abstractly and quantitatively.
Students use quantitative reasoning as they solve subtraction problems involving fractions.
3. Construct viable arguments and critique the reasoning of others.
Students determine strategies for computing with fractions and construct arguments to justify their results.
4. Model with mathematics.
Students model with math when they apply bar models and equations to represent problems involving fraction operations.
5. Use appropriate tools strategically.
Students use tools, such as fraction strips, to represent fraction operations and solve problems.
6. Attend to precision.
Students attend to precision when they use and explain fraction computations, and when they use the correct units in their solutions.
7. Look for and make use of structure.
Students look for structure when they examine relationships in fraction computation.
8. Look for and express regularity in repeated reasoning.
Students use repeated reasoning when they generalize about fraction operations.

Interdisciplinary Connections:	**CS & DT:**
1.1.5.B.1 - Identify the elements of music in response to aural prompts and printed music notational systems. *Example- In music, notes have fractional parts. Students will be able to add or subtract the fractions to create the musical piece.*	8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate. *Example: In lesson 9-2, students determine there are multiple strategies and/or tools to decompose fractions. Students pick one and discuss the reasoning for choosing how they represented their portion.*

CLKS:

9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).
Example: Students utilize different strategies and/or tools to solve for decomposing and composing word problems involving fractions. Students share their strategy that helped them reach their answer. Students compare and contrast strategies used.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

Enduring Understandings:

- Tools 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 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.
- Tools can be used to show subtraction 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 the number line.
- 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.
- Two procedures for subtracting mixed numbers both involve changing the calculation to a simpler equivalent calculation. These are extensions of the same procedures used for adding mixed numbers with like denominators.
- Good math thinkers choose and apply math they know to show and solve problems from everyday life.

Essential Questions:

- How can you represent a fraction in a variety of ways?
- How can you use tools to add and subtract fractions?
- How can fractions be added and subtracted on a number line?
- How do you add and subtract fractions with like denominators?
- How do you add and subtract mixed numbers with like denominators?
- How can you use math to model problems?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
Students will know: Compose Decompose Fraction Numerator Denominator Mixed Number Equivalent Fraction Sum Difference Number Line Unit fraction	***Students will be able to:*** ● 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 with like denominators. ● Use tools such as fraction strips, area models, and number lines to subtract fractions. ● Solve problems involving separating parts of the same whole by subtracting fractions. ● Count forward or backward on a number line to add or subtract.

Point Segment Commutative Property of Addition Associative Property of Addition Bar diagram Equation Variable	• Use models and equivalent fractions to add and subtract mixed numbers. • Use equivalent fractions and properties of operations to add mixed numbers with like denominators. • Use equivalent fractions, properties of operations, and the relationship between addition and subtraction to subtract mixed numbers with like denominators. • Use previously learned concepts and skills to represent and solve problems.
ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	• Topic 9 Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16
RESOURCES	
Core instructional materials: enVision Teacher Manual Volume 2	

enVision Student Edition Volume 2 enVision Additional Practice Book ALEKS
Supplemental materials: Leveled worksheets Guided Math-Place Value Kit Additional Resources on Drive
Modifications for Learners
See appendix

Topic Unit 10 Title	**Extend Multiplication Concepts to Fractions**	**Approximate Pacing**	**6 Days**
STANDARDS			
NJSLS (Math)			
4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.			
4.NF.B.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.			
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. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.			
4.NF.B.3c Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction			
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.			
4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm. mm; 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. 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), ...			
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.

Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them.
Students make sense of problems involving multiplication, persevere in solving them, and consider whether their answers make sense.

2. Reason abstractly and quantitatively.
Students use reasoning to analyze relationships between quantities in problems involving multiplying a fraction by a whole number.

3. Construct viable arguments and critique the reasoning of others.
Students construct arguments to justify the results of the fraction computations.

4. Model with mathematics.
Students model with math when they use diagrams and equations to solve real-world problems involving multiplying a fraction by a whole number.

5. Use appropriate tools strategically.
Students use tools, such as a bar diagram or number line, to represent and solve problems.

6. Attend to precision.
Students attend to precision when they use and explain fraction computations, and when they choose the correct units in their solutions.

7. Look for and make use of structure.
Students look for structure when they examine relationships in fraction computations.

8. Look for and express regularity in repeated reasoning.
Students use repeated reasoning when they generalize about fraction operations.

Interdisciplinary Connections:	**CS & DT:**
RI.4.4. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area. *Example: Students are learning and using the vocabulary words numerator, denominator, and whole number when referring to fractions.*	8.2.5.ETW.1: Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems. *Example: During the solve and share, students explain the use of their tool they used to solve the problem.*

CLKS:

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data
Example: Students use a graph with data regarding how many miles Dori walks to and from school Monday-Friday to determine the total number of miles for the week. Students can use the following ways to show the data; a picture, a number line, equation, etc.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS	
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. ● The standard algorithms for adding, and subtracting, as well as various strategies for 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.	
Essential Questions: ● How can you describe a fraction using a unit fraction? ● How can you multiply a fraction by a whole number? ● How can you use symbols to multiply a fraction by a whole number? ● How can you solve problems involving time? ● How can you represent a situation with a math model?	
STUDENT LEARNING OBJECTIVES	
Key Knowledge	**Process/Skills/Procedures/Application of Key Knowledge**
Students will know: Fraction Numerator Denominator Mixed Number Decompose Repeated Addition Sum Difference Product Quotient Factor Multiple Unit fraction Bar diagram Associative Property of Multiplication	***Students will be able to:*** ● Use a model, repeated addition, and multiplication 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 the four operations to solve problems involving time. ● Use previously learned concepts and skills to represent and solve problems.

Unit Elapsed Time Year Month Week Day Hour Minute Second Equation Variable Regroup Hidden question	
ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	• Topic 10 Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16

RESOURCES
Core instructional materials: ConnectEd Everyday Math 4 ALEKS
Supplemental materials: Leveled worksheets Guided Math-Place Value Kit Additional Resources on Drive
Modifications for Learners
See appendix

Topic Unit 11 Title	Represent and Interpret Data on Line Plots	Approximate Pacing	5 Days
STANDARDS			
NJSLS (Math)			
4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 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.B.3c Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.			
4.NF.B.3d Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.			
4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × 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.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 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.			

Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them.
Students persevere as they use a line plot to answer questions about the data.

2. Reason abstractly and quantitatively.
Students use reasoning to interpret data represented on a line plot.

3. Construct viable arguments and critique the reasoning of others.
Students critique other's interpretations of data represented on a line plot.

4. Model with mathematics.
Students model with math when they know about operations to answer questions about the data represented in a line plot.

5. Use appropriate tools strategically.
Students use tools, such as tables and line plots, to display data.

6. Attend to precision.
Students attend to precision when they use the appropriate labels for data problems.

7. Look for and make use of structure.
Students make use of structure when they look for patterns in data represented on a line plot.

8. Look for and express regularity in repeated reasoning.
Students express regularity when they make generalizations about interpreting data represented on a line plot.

Interdisciplinary Connections:	**CS & DT:**
RI.4.7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. *Example- Students are reading and solving word problems with and without line plots.*	8.2.5.ITH.2: Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have. *Example: In lesson 11-2, students are asked to create line plots to display data gathered. Students discuss how the creation of a line plot helps to display data in an organized way. Students must have the background knowledge of reading a line plot in order to analyze data.*

CLKS:

The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).

Example- Students are asked to evaluate the distance walked by Eli for seven days. Students are asked to determine the total number of miles walked and the difference between the longest distance and the shortest distance.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

Enduring Understandings:

- A line plot organizes data on a number line and is useful for showing how data are 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.

Essential Questions:

- How can you read data on a line plot?
- How can you solve problems using data on a line plot?
- How can you make a line plot?
- How can you use line plots to solve problems involving fractions?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
Students will know: Number line Line plot Data Table Scale Unit Greatest Least Difference Sum Most common/often Least common/often Outlier Commutative Property of Addition Associative Property of Addition Fraction	***Students will be able to:*** ● 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.

Mixed Number Numerator Denominator Like denominators Unlike denominators Argument Critique Reasoning	
ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	• Topic 11 Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16
RESOURCES	
Core instructional materials: enVision Teacher Manual Volume 2 enVision Student Edition Volume 2 enVision Additional Practice Book	

ALEKS
Supplemental materials: Leveled worksheets Guided Math-Place Value Kit Additional Resources on Drive
Modifications for Learners
See appendix

Topic Unit 12 Title	**Understand and Compare Decimals**	**Approximate Pacing**	**7 Days**
STANDARDS			
NJSLS (Math)			
4.NF.C.6 Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.			
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.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 100.4 For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.			
Standards for Mathematical Practice: **1. Make sense of problems and persevere in solving them.** Students make sense of problems related to decimals, persevere in solving them, and consider whether their answers make sense. **2. Reason abstractly and quantitatively.** Students use quantitative reasoning as they compare decimals. **3. Construct viable arguments and critique the reasoning of others.** Students critique the reasoning of others when looking at problems related to fractions and decimals.			

4. Model with mathematics.
Students model with math when they use drawings, decimal grids, and decimals to represent fractions.
5. Use appropriate tools strategically.
Students use tools, such as place-value blocks, hundredths grids, or place-value charts, to represent and compare decimals.
6. Attend to precision.
Students attend to precision when solving problems involving money.
7. Look for and make use of structure.
Students look for structure when locating decimals on a number line.
8. Look for and express regularity in repeated reasoning.
Students use repeated reasoning when they generalize about estimation and decimal operations.

Interdisciplinary Connections:	**CS & DT:**
RI.4.7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. *Example: During 12-1's solve and share, students use information from a survey to represent the amount of dog owners using fractions and/or decimals.*	8.2.5.ITH.4: Describe a technology/tool that has made the way people live easier or has led to a new business or career. *Example: In lesson 12-5, students are solving word problems involving money. Students discuss the various tools that people use that help with solving adding, subtracting, multiplying, and/or dividing of money.*

CLKS:

9.1.5.FP.3: Analyze how spending choices and decision-making can result in positive or negative consequences
9.1.5.FP.4: Explain the role of spending money and how it affects wellbeing and happiness (e.g., "happy money," experiences over things, donating to causes, anticipation, etc.).
Example: In lesson 12-5, students solve various word problems regarding spending and saving money.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

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 relationships in math to help solve problems.

Essential Questions:

- How can you write a fraction as a decimal?
- How can you write a decimal as a fraction?
- How can you locate points on a number line?
- How do you compare decimals?
- How can you add fractions with denominators of 10 and 100?
- How can you solve word problems involving money?
- How can you look for and make use of structure to solve problems?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
Students will know: fraction decimal decimal point place value tenth hundredth numerator denominator like denominator unlike denominator equivalent fraction less than symbol (<) greater than symbol (>) sum difference regroup money	***Students will be able to:*** ● 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. ● Use the structure of the place value system for decimals to solve problems.

bills coins dollar quarter dime nickel penny number line point quantities	

ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	• Topic 12 Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16

RESOURCES
Core instructional materials: enVision Teacher Manual Volume 2

enVision Student Edition Volume 2 enVision Additional Practice Book ALEKS
Supplemental materials: Leveled worksheets Guided Math-Place Value Kit Additional Resources on Drive
Modifications for Learners
See appendix

Topic Unit 13 Title	**Measurement: Find Equivalence in Units of Measure**	**Approximate Pacing**	**8 Days**
STANDARDS			
NJSLS (Math)			
4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm. mm; 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. 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), ...			
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.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.			
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.			

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. For example, if each person at a party will eat 3/8 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?

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.

Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them.
Students make sense of problems related to perimeter and area, persevere in solving them, and consider whether their answers make sense.

2. Reason abstractly and quantitatively.
Students use quantitative reasoning as they determine the best way to use numbers and units to describe measurements.

3. Construct viable arguments and critique the reasoning of others.
Students critique the reasoning of others when looking at problems related to converting measurements.

4. Model with mathematics.
Students model with math when they use equations to find perimeter and area.

5. Use appropriate tools strategically.
Students use tools, such as rulers, to solve measurement problems.

6. Attend to precision.
Students attend to precision when solving measurement problems.

7. Look for and make use of structure.
Students make use of structure when they use the relationship between units to convert measurements.

8. Look for and express regularity in repeated reasoning.
Students generalize when they recognize the need to multiply when converting a larger unit to a smaller unit.

Interdisciplinary Connections:	CS & DT:
4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. *Example- In Science, students will measure, record and convert measurements for effects of weathering in order to make claims.*	Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data. 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data. 8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim. Many factors influence the accuracy of inferences and predictions.

	8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data. *Example- Students are asked to use a graphic organizer to compile data on liquid measurements. They are then asked to use that data to answer word problems.*

CLKS:

9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.
Example: In lesson 13-2, students are solving word problems involving units of capacity. Students discuss professions that should have an understanding of the different uses of capacity and the algorithms on how to solve for equivalence of the different capacities.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

Enduring Understandings:

- 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 a larger unit.
- To convert from a larger unit of capacity to a smaller unit of capacity, multiply the number of larger units by the conversion factor, that is, the number of smaller units in a larger unit.
- To convert from a larger unit of weight to a smaller unit of weight, multiply the number of larger units by the conversion factor, that is, the number of smaller units in a larger unit.
- To convert from a larger unit of mass to a smaller unit of mass, multiply the number of larger units by the conversion factor, that is, the number of smaller units in a larger unit.
- Some problems can be solved by applying the formula for the perimeter of a rectangle or the formula for the area of a rectangle.
- Good math thinkers are careful about what they write and say, so their ideas about math are clear.

Essential Questions:

- How can you convert from one unit to another?
- How can you be precise when solving math problems?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
Students will know: conversion factor unit customary units of length	***Students will be able to:*** ● Recognize the relative size of customary units of length and convert from a larger unit to a smaller unit.

inch foot yard mile Customary Units of Capacity gallon quart cup pint fluid ounce (fl oz) Customary Units of Weight ounce pound ton Metric units of Length meter millimeter centimeter kilometer Metric Units of Mass gram milligram kilogram Metric Units of Capacity liter milliliter perimeter length width area square units dimensions formula convert	● Recognize the relative size of customary units of capacity and convert from a larger unit to a smaller unit. ● Recognize the relative size of customary units of weight and convert from a larger unit to a smaller unit. ● Recognize the relative size of metric units of length and convert from a larger unit to a smaller unit. ● Recognize the relative size of metric units of capacity and convert from a larger unit to a smaller unit. ● Recognize the relative size of metric units of mass and convert from a larger unit to a smaller unit. ● Find the unknown length or width of a rectangle using the known area or perimeter. ● Good thinkers are careful about what they write and say, so their ideas about math are clear.

measure	
ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	• Topic 13 Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16
RESOURCES	
Core instructional materials: enVision Teacher Manual Volume 2 enVision Student Edition Volume 2 enVision Additional Practice Book ALEKS	
Supplemental materials: Leveled worksheets Guided Math-Place Value Kit Additional Resources on Drive	
Modifications for Learners	
See appendix	

Topic Unit 14 Title	**Algebra: Generate and Analyze Patterns**	**Approximate Pacing**	**5 Days**

STANDARDS
NJSLS (Math)
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. 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.
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.
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.
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.
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.
Standards for Mathematical Practice: **1. Make sense of problems and persevere in solving them.** Students make sense of problems related to patterns, persevere in solving them, and consider whether their answers make sense. **2. Reason abstractly and quantitatively.** Students use quantitative reasoning as they use rules to generate quantities and then analyze the patterns that result. **3. Construct viable arguments and critique the reasoning of others.**

Students construct arguments to justify conclusions involving patterns.
4. Model with mathematics.
Students model with math when they apply what they know about numerical patterns to solve problems involving rules.
5. Use appropriate tools strategically.
Students use tools, such as cubes, to model patterns.
6. Attend to precision.
Students attend to precision when using rules to generate patterns and describing the relationship between terms.
7. Look for and make use of structure.
Students analyze patterns to find relationships between numbers.
8. Look for and express regularity in repeated reasoning.
Students use repeated reasoning when they determine whether a rule can be applied to a group of numbers to create a pattern.

Interdisciplinary Connections:	**CS & DT:**
2.6.4.A.1 Determine the physical, social, emotional, and intellectual benefits of regular physical activity. *Example- Students analyze data on the amount of time to burn calories for various sports and athletic activities to make choices on which activity burns the most and least calories.*	8.2.5.ITH.2: Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have. 8.2.5.ITH.3: Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use. *Example: In lesson 14-1, students use a chart to determine patterns with numbers when given a specific rule.*

CLKS:

The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process
9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1).
Example: During 14-2's visual learning bridge, students analyze data provided to determine a pattern regarding the cloverleaf. Students use a table to display the data.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

Enduring Understandings:

- Rules can be used to create or extend number sequences that form a pattern. Those patterns sometimes have features not described by the rule.
- Rules can be to create or extend patterns in tables. Patterns sometimes have features not described by the rule.

- It is possible to predict a shape in a repeating pattern of shapes.
- Good math thinkers look for relationships in math to help solve problems.

Essential Questions:

- What is the pattern?
- How can you use a rule to continue a pattern?
- How can you use a table to extend a pattern?
- How can you use a repeating pattern to predict a shape?
- How can you look for and make use of structure?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
Students will know: pattern rule table starting number feature (of a pattern) repeating pattern number sequence even number odd number factor multiple inverse operations variable unknown	***Students will be able to:*** ● 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. ● Use a rule to extend a number pattern and solve a problem. Identify features of the pattern. ● Generate a shape pattern that follows a given rule and predict a shape in the pattern. ● Solve problems by using patterns.

ASSESSMENT OF LEARNING

Summative Assessment (Assessment at the end of the learning period)	● Topic 14 Online Assessment

Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16
RESOURCES	
Core instructional materials: enVision Teacher Manual Volume 2 enVision Student Edition Volume 2 enVision Additional Practice Book ALEKS	
Supplemental materials: Leveled worksheets Guided Math-Place Value Kit Additional Resources on Drive	
Modifications for Learners	
See appendix	

Topic Unit 15 Title	Geometric Measurement: Understanding Concepts of Angles and Angle Measurement	Approximate Pacing	7 Days
STANDARDS			
NJSLS (Math)			
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.			
4.MD.C.5 Geometric measurement: understand concepts of angle and measure angles. 5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: 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 1/360 of a circle is called a "one degree angle," and can be used to measure angles. 4.MD.C.5b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.			
4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × 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. Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.			
4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b. 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. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.			
4.MD.C.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.			
4.MD.C.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measures.			
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm. 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.			
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.			
<u>Standards for Mathematical Practice:</u> 1. Make sense of problems and persevere in solving them.			

Students make sense of problems related to angle measurement, persevere in solving them, and consider whether their answers make sense.
2. Reason abstractly and quantitatively.
Students use reasoning as they analyze attributes of angles.
3. Construct viable arguments and critique the reasoning of others.
Students critique the reasoning of others when looking at problems related to angle measures.
4. Model with mathematics.
Students model with math when they write and solve equations to find angle measurements.
5. Use appropriate tools strategically.
Students use tools, such as protractors, to measure angles.
6. Attend to precision.
Students attend to precision when describing angle measurements.
7. Look for and make use of structure.
Students look for relationships among angles.
8. Look for and express regularity in repeated reasoning.
Students generalize when they look at the number of one-degree angles in an angle measure.

Interdisciplinary Connections:	**CS & DT:**
1.3.5.D.2 Identify common and distinctive characteristics of artworks from diverse cultural and historical eras of visual art using age-appropriate stylistic terminology (e.g., cubist, surreal, optic, impressionistic), and experiment with various compositional approaches influenced by these styles. *Example- In art, students are creating artwork using different types of lines, line segments, angles, and other geometric shapes*	8.2.5.ITH.4: Describe a technology/tool that has made the way people live easier or has led to a new business or career. *Example: In topic 15, students use tools such as protractors to help solve problems.*

CLKS:

9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.
Example: In topic 15, students solve various problems regarding angles, lines, and rays. Connecting to what students are learning in art, students brainstorm different professions that would involve the use of lines, angles, etc.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

Enduring Understandings:

- Line segments and rays are sets of points that describe parts of lines and angles.
- Angles are classified by their measure.
- The measure of an angle depends upon the fraction of a circle that the angle turns through.
- The unit for measuring angles is 1 degree, the unit angle.
- A protractor could be used to measure angles.
- Angles measures can be added and subtracted.
- Good math thinkers know how to pick the right tools to solve math problems.

Essential Questions:

- What are some common geometric terms?
- What is the unit used to measure angles?
- How can you measure angles?
- How do you use a protractor?
- How can you add and subtract to find unknown angle measures?
- How can you select and use appropriate tools to solve problems?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
Students will know: Point Endpoint Line Line segment Ray Common ray Vertex Angle Unit angle Angle measure Degree Protractor Right angle Obtuse angle Acute angle	***Students will be able to:*** ● Recognize and draw lines, ryas, and eagles with different measures. ● Find the measure of an angle that turns through a fraction of a circle. ● Use known angle measures to measure unknown angles. ● Use a protractor to measure and draw angles. ● Use addition and subtraction to solve problems with unknown angle measures. ● Use appropriate tools, such as a protractor and ruler, to solve problems.

Straight angle Non-overlapping angles Decompose Fraction Equation Sum Bar diagram	

ASSESSMENT OF LEARNING	
Summative Assessment (Assessment at the end of the learning period)	• Topic 15 Online Assessment
Formative Assessments (Ongoing assessments during the learning period to inform instruction)	• Quick Checks • Anecdotal Notes • Math Journal • Exit Slips
Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)	• Google Practice Sets • Leveled worksheets/activities • PBL (extensions) • modified assessments as per IEPs
Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)	• NWEA Math MAP Assessment (beginning, middle, and end of year) • Cumulative 1-8 • Cumulative 1-16

RESOURCES
Core instructional materials: enVision Teacher Manual Volume 2 enVision Student Edition Volume 2 enVision Additional Practice Book ALEKS

Supplemental materials: Leveled worksheets Guided Math-Place Value Kit Additional Resources on Drive
Modifications for Learners
See appendix

Topic Unit 16 Title	**Lines, Angles, and Shapes**	**Approximate Pacing**	**10 Days**
STANDARDS			
NJSLS (Math)			
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.			
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.			
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.			
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. 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.			
4.MD.C.5 Geometric measurement: understand concepts of angle and measure angles. 5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: a. 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 1/360 of a circle is called a "one degree angle," and can be used to measure angles. b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.			
4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.			

Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them.
Students make sense of problems, persevere in solving them, and consider whether their answers make sense.

2. Reason abstractly and quantitatively.
Students use quantitative reasoning as they analyze attributes of shapes.

3. Construct viable arguments and critique the reasoning of others.
Students critique the reasoning of others when looking at problems related to classifying lines.

4. Model with mathematics.
Students model with math when they use drawings and symmetry to complete designs.

5. Use appropriate tools strategically.
Students use tools, such as protractors (to measure angles) and rulers (to measure line segments), when classifying two-dimensional figures.

6. Attend to precision.
Students analyze attributes to be precise in their classification.

7. Look for and make use of structure.
Students look for structures when comparing and contrasting attributes of shapes.

8. Look for and express regularity in repeated reasoning.
Students generalize when classifying shapes.

Interdisciplinary Connections:	**CS & DT:**
4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move. *Example- In Science, students develop models of waves and classify them by analyzing points and segments. Students use math vocabulary-line, line segment, ray, point, angles.* 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. ● <u>STEM Project: Senses and Symmetry:</u> Explain to students that animals process the information received from their senses and use that information to guide their actions. Research how the location of an animal's eyes helps it to survive in the wild (e.g. why do some animals have eyes on the sides of their head and others have eyes on the	8.2.5.ITH.3: Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use. *Example- Students are asked to create symmetric shapes. They can utilize paper and pencil to create the shapes or choose to use an online tool. The choice of digital versus non digital tools is student preference.*

front). Discuss how most animals are the same on both sides of their body. Have students find and illustrate other examples of line symmetry found in nature. Then, have students explain how they know that both sides of their drawing are symmetrical. Have students list other animal senses and share how those senses help animals respond to their environment. 1.3.5.D.2 Identify common and distinctive characteristics of artworks from diverse cultural and historical eras of visual art using age-appropriate stylistic terminology (e.g., cubist, surreal, optic, impressionistic), and experiment with various compositional approaches influenced by these styles. *Example- In art, students are creating artwork using different types of lines, line segments, angles, and other geometric shapes.*	

CLKS:

9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).
In lesson 16-2, students sort and classify triangles into groups based on how they are alike and how they are different. Students share their groupings.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

Enduring Understandings:

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

Essential Questions:

- How can you describe pairs of lines?
- How can you classify triangles?
- How can you classify quadrilaterals?
- What is line symmetry?
- How can you draw figures with line symmetry?
- How can you critique the reasoning of others?

STUDENT LEARNING OBJECTIVES	
Key Knowledge	**Process/Skills/Procedures/Application of Key Knowledge**
Students will know: Point Line Line segment Parallel lines Perpendicular lines Intersecting lines Polygon Sides Vertices Right triangle Obtuse triangle Acute triangle Equilateral triangle Isosceles triangle Scalene triangle Quadrilateral Trapezoid Right trapezoid Parallelogram Rhombus Square Rectangle Line symmetric Line of symmetry Generalization Regular figure	***Students will be able to:*** ● 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.
ASSESSMENT OF LEARNING	
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Modifications for Learners	
See appendix	