Introduction

The K-5 standards provide students with a solid foundation in whole numbers, addition, subtraction, multiplication, division, fractions and decimals—which help young students build the foundation to successfully apply more demanding math concepts and procedures, and move into applications.

The standards stress not only procedural skill but also conceptual understanding, to make sure students are learning and absorbing the critical information they need to succeed at higher levels.

These standards define what students should understand and be able to do in their study of mathematics. What does mathematical understanding look like? One hallmark of mathematical understanding is the ability to justify, in a way appropriate to the student's mathematical maturity, why a particular mathematical statement is true or where a mathematical rule comes from. There is a world of difference between a student who can summon a mnemonic device to expand a product such as $(a + b)(x + y)$ and a student who can explain where the mnemonic comes from. The student who can explain the rule understands the mathematics, and may have a better chance to succeed at a less familiar task such as expanding $(a + b + c)(x + y)$. Mathematical understanding and procedural skill are equally important, and both are assessable using mathematical tasks of sufficient richness.

All students must have the opportunity to learn and meet the same high standards if they are to access the knowledge and skills necessary in their post-school lives. The standards do provide clear signposts along the way to the goal of college and career readiness for all students.

Gifted & Talented

The Saddle River School District extends learning opportunities to all high achieving students. It supports the philosophy that every student has special talents and gifts. The Saddle River School District's enrichment and gifted & talented programs offer a unique approach to servicing all students while maintaining a focus on those who are identified as needing pull out services through the district's screening/criteria process. The Saddle River School District's enrichment program focuses on bringing out the special talents in all learners as enrichment instruction is delivered to all students in grades kindergarten through fifth grade. The program follows the Joseph Renzulli schoolwide enrichment model that concentrates on "schools being a place for talent development," (Renzulli, 1994). The program follows a wide-range of enriching/developing activities based upon student strengths and interests. Additionally, the program focuses on enriching activities across the curriculum in providing complementary and developing features/standards for all subject areas. The enrichment program builds upon existing student learning standards in all content areas in coordination with instruction and student needs.

The Saddle River School District Gifted & Talented program offers pull-out instruction for those students meeting the multiple measures and specific criteria set forth and approved by the board of education. The identification process may/can begin as early as kindergarten. The gifted and talented program follows the central theme that all appropriate curriculum standards are followed and that those standards are the

foundation for developing student learning opportunities and standards across the curriculum. The gifted and talented program will provide the following in coordination with each content area when and where appropriate:

- Develop students' abilities and engage critical thinking skills
- Expand students' creative thought process and responses
- Advance students' research skills needed to become independent learners
- Develop students' abilities to self-evaluate their own learning process
- Enrich students' abilities in seeking and expanding their own knowledge in subject content areas and individual talents
- Develop students' ability to interact effectively in small-group and large-group setting
- Heighten students' ability in expanding on student learning standards to strengthen appropriate skills necessary for 21st century learning

English Language Learners (ELL)

The Saddle River School District recognizes the importance of increasing language proficiency while gaining confidence and strength so that academic goals and New Jersey state learning standards can be met. English Language Learners in the Saddle River School District are identified through a multitude of measures. These measure include, but are not limited to: a home language survey, parental conferencing, and daily teacher observations. Based on the information/data collected, the Saddle River School District will determine if a formal approved language assessment is necessary. The World-Class Instructional Design and Assessment (WIDA) is the assessment tool for those students recommended for ELL testing.

The Saddle River School District will provide the following accommodations for ELL students:

- Basic skills with a focus a the specific language skills
- Use of a translation dictionary (ipad, google translator, bilingual word to word dictionary)
- Preferential seating
- Extended time and/or modified classroom assignments
- Print out of teacher notes/lessons for additional review
- Extended time and/or modified assessments
- Extended time/accommodation for standardized testing in coordination with state regulations

Special Education Students

The Saddle River School District special education department offers a full continuum of services for students who are eligible for special education services. In order to meet the specific requirements for each learner, programs are developed so that that social, emotional and educational needs are met within the least restrictive environment. The specific program for each learner is based on individual needs where goals and objectives are set and followed accordingly. These individual educational plans follow a specific plan that is aligned to the student learning standards and may include, but is/are not limited to:

- Individual education plan
- Pull-out support
- Replacement content instruction
- In-class support
- Instructional aide(s)
- Support services (i.e.; speech, physical therapy, occupational therapy)
- Presentation accommodations (i.e.; notes, outlines, instructions, lists, organization)
- Response accommodations (i.e.; dictations, audio, dictionaries, calculation devices, scribes)

- Setting accommodations (i.e.; lighting, acoustics, seat placement, testing, sensory tools)
- Timing accommodations (i.e.; completing tasks, frequent breaks, processing directions)
- Scheduling accommodations (i.e.; spacing out projects/assignments, order of schedule)
- Organizational accommodations (i.e.; highlighter, time management, planning)
- Assignment modifications (i.e.; fewer tasks, alternate questions)
- Technology support (i.e; ipad, word processing, specific programs/apps)
- Testing accommodations (i.e.; extended time, placement, seating, time)

Students who require additional services outside of the district's resource program, may require an out-of-district placement. In this event, the Child Study Team will coordinate accordingly to ensure that all necessary learning standards are being met.

Students in Danger of Failing

For those students in danger of failing, the Saddle River School District has a specific referral process to ensure that student needs are being met. The Intervention & Referral Services (I&RS) is an interdisciplinary team of professional within the school that addresses a full range of student/staff needs and concerns. This process is designed to maximize student success and establish goals and benchmarks to promote outcomes that positively reflect academics, health, behavior, self-esteem, work habits and strong character. The I&RS team is comprised of a chairperson, child study team member, teachers and other school professionals so that a continuous system of support can be provided. The team provides a plan so that short and long term goals can be established and strategies can be implemented and designed specifically for each student. In trying to achieve success, the team works collaboratively in making growth for each student a top priority and adhere to a plan that is achievable but rigorous. This plan, as set by New Jersey I&RS Team Process, may contain, but is not limited to the following;

- Request for assistance
- Information collection
- Parent Notification
- Problem solving within the I&RS team
- Developing an I&RS action plan
- Supporting, evaluating and continuing the process

In evaluating and monitoring students, the I&RS team closely calculates a plan so that curriculum needs can be met. In order to achieve and demonstrate success, the Saddle River School District provides modifications and support so that consideration is given to, but not limited to, the following:

- Student strengths/weaknesses
- Classroom and standardized assessments
- Academic records
- Social and behavioral patterns
- Previous history or concern
- Participation in class (and interaction with peers)
- Health related concerns
- Family concerns
- Retention of information/instruction
- Student interests
- Independent & group work habits
- Emotional status
- Study habits (at home/school)
- Present level of functioning
- Expectations (academic, social, behavioral, etc.)

- Following classroom rules/directions/procedures

As the I&RS team formulates a plan, many ongoing concerns are addressed within the team and may include parental notification/input. The problem solving objectives as set forth by New Jersey I&RS Team Process will:

- Describe the problem
- Identify the priority
- Develop objectives
- Review previous interventions
- Create new strategies
- Analyze and evaluate solutions

The Saddle River School District continues to inform and update staff of the I&RS procedures. The procedures are as follows:

- Teacher recognizes a problem(s) with a particular student in class and refers the student to the I&RS committee by filling out the appropriate paperwork. An I&RS meeting is scheduled to and the committee and appropriate staff members gather to discuss and begin the proactive process of assistance.
- Information from the teacher(s), administrator(s), and other school personnel is collected.
- Parent notification where/when appropriate
- The I&RS team begins the problem solving process by offering ideas and suggestions pertaining to the problems while prioritizing the most important issues.
- The I&RS team develops an action plan with specific strategies that can be implemented to achieve both short term and long term goals.
- The I&RS team meets regularly to evaluate and support the action plan (and to adjust accordingly when/where appropriate). Parents are notified on an ongoing basis to continue communication in the support of implementing the strategies set forth in the action plan.

Basic Skills Instruction is also a valuable resource that the Saddle River School District uses to meet the needs of struggling students. Students who require additional academic support will be offered that assistance in all subject areas. This system allows the students to receive in-class or pull-out support when and where appropriate so that grade level curriculum and student learning goals can be met. This program is an intervention system used to create a positive and constructive learning environment so that students can achieve success.

After the I&RS action plan has been in place the team may continue with the current strategies, offer/discuss new strategies or decide that the student should be referred to the district's child study team. In the instance of referring a student to the child study team, it can be concluded that many of the strategies from the action plan were not benefitting the student as intended. The child study team them would follow the guidelines for the referral process and notify the parents/guardians of the potential special education recommendation.

National Governors Association Center for Best Practices, Council of Chief State School Officers. "Common Core State Standards - Mathematics." National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C., 2010. Web. 20 June 2012. <http://www.corestandards.org/the-standards/mathematics>.

Unit Overview

Content Area: Mathematics

Unit Title: Operations and Algebraic Thinking

Grade Level: Grade 4

Unit Summary

Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi- digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.

Primary interdisciplinary connections: Science, Social Studies, Physical Education, Writing

21st century themes:

- Critical Thinking/Problem Solving
- Communication
- Collaboration

Unit Rationale

A firm grounding in the big picture of how operations with numbers interrelate and how they are vital tools in life can help students build the positive attitudes that will help them become confident, efficient, and effective problem-solvers (McConnell, 2011)

Algebraic thinking develops problem-solving skills. Students must analyze what they know and don't know about a problem, determine a method for finding solutions, and check results for accuracy. Algebra provides students with resources for dealing with real-world situations in a "systematic, analytic manner." (McConnell, 2011)

Recognizing, analyzing and constructing patterns helps to build a "strong foundation of algebra readiness", and is central to both art and science. (McConnell, 2011)

Learning Targets

Standards

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.OA.A.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*.

Content Statements

- Use the four operations with whole numbers to solve problems.
- Generate and analyze patterns.

indicators	
4.OA.A.1	Write multiplication equations from multiplicative comparisons given in words (example, 35 is 5 times as many as 7 and 7 times as many as 5) and describe a multiplication equation in words.
4.OA.A.2	• Multiply or divide to solve word problems involving multiplicative comparisons. • Write an equation to identify the arithmetic operation written in a word problem (without solving).
4.OA.A.3	Compose equations from information supplied in word problems using letters to represent unknowns and solve the word problems with addition and subtraction.
4.OA.C.5	Generate number or shape patterns by using rules including words, models, or graphs, and identify apparent features of the pattern that were not explicit in the rule of the original pattern. 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.

Unit Essential Questions

- **Topic 1**
  - How can patterns and properties be used to find some multiplication facts?
  - How can unknown multiplication facts be found by breaking them apart into known facts?
  - How can unknown division facts be found by thinking about a related multiplication fact?
- **Topic 2**
  - How can patterns be used to describe how two quantities are related?
  - How can a relationship between two quantities be shown using a table?

Unit Enduring Understandings

- The symbolic language of algebra is used to communicate and generalize the patterns in mathematics.
- Algebraic representation can be used to generalize patterns and relationships.
- Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.
- Mathematical models can be used to describe and quantify physical relationships.
- Physical models can be used to clarify mathematical relationships.
- One representation may sometimes be more helpful than another, and used together, multiple representations give a fuller understanding of a problem.
- A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways.
- Numeric fluency includes both the understanding

4th Grade Wandell School Math Curricula

Aligned to the New Jersey Student Learning Standards

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	of and the ability to appropriately use numbers. **(source:** http://jaymctighe.com/wordpress/wp-content/uploads/2013/04/NEW-JERSEY-UbD-MAPS.pdf)

Unit Learning Targets
Students will ...

- Write multiplication equations from multiplicative comparisons given in words (example, 35 is 5 times as many as 7 and 7 times as many as 5) and describe a multiplication equation in words.
- Multiply or divide to solve word problems involving multiplicative comparisons.
- Write an equation to identify the arithmetic operation written in a word problem (without solving).
- Compose equations from information supplied in word problems using letters to represent unknowns and solve the word problems with addition and subtraction.
- Generate number or shape patterns by using rules including words, models, or graphs, and identify apparent features of the pattern that were not explicit in the rule of the original pattern. 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.

Evidence of Learning

Summative Assessment (at the end of each topic)
Each topic has a summative test and a performance task.

Equipment needed: see individual topics

Teacher Resources: *enVision Math Common Core: Realize Edition.* 2015

Formative Assessments

- teacher observation
- homework
- "Review What You Know"
- "Independent Practice"
- Topic performance task

Topics

Topic	Timeframe
Topic 1 *Multiplication and Division: Meanings and Facts*	14 days
Topic 2 *Generate and Analyze Patterns*	14 days

Teacher Notes:
This unit consists of two topics from the *enVision Math* series with anywhere from 6 to 10 lessons per topic. These two topics address the Operations and Algebraic Thinking domain of the standards for Mathematics for Grade 4 students. In addition, these two topics address all eight of the Standards for Mathematical Practice.

Essential questions were taken directly from the textbook series used by the district, *enVision Math Common Core: Realize Edition.*

4th Grade Wandell School Math Curricula

Aligned to the New Jersey Student Learning Standards

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Enduring understandings were taken from *Overarching Understandings and Essential Questions (New Jersey)* at http://jaymctighe.com/resources/downloads/

Curriculum Development Resources

Click the links below to access additional resources used to design this unit:

NJDOE. "Model Curriculum: Mathematics (K-12) - Grade 4." Model Curriculum: Mathematics (K-12) - Grade 4. New Jersey Dept. of Education, n.d. Web. 27 June 2015. <http://www.state.nj.us/education/modelcurriculum/math/1.shtml>.

Charles, Randall. *enVision Math Common Core*. Realize ed. Grade 4. Upper Saddle River: Pearson Education, 2015. Print. enVision Math

McConnell, Carolyn. *The Essential Questions Handbook*. New York: Scholastic, 2011. Print.

Topic 1	
Content Area: Mathematics	
Title: Multiplication and Division: Meanings and Facts	**14 days**

Topic Components

21st Century Themes

	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy

21st Century Skills

	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration

Interdisciplinary Connections: Social Studies, Science, Physical Education, Writing

Integration of Technology: Digital resources are part of this textbook series.

Equipment needed: place value blocks, grid paper, hundreds chart, counters

Vocabulary:

- array
- product
- factors
- multiple
- Commutative Property of Multiplication
- Zero Property of Multiplication
- Identity Property of Multiplication
- Distributive Property

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: •Generate number or shape patterns by using rules including words, models, or graphs, and identify apparent features of the pattern that were not explicit in the rule of the original pattern. For example, given the rule "Add 3" and the starting number 1 generate terms in the resulting sequence	1. Review What You Know! 2. Interactive Learning 3. Meanings of Multiplication 4. Mixed Problem Solving 5. Patterns for Facts 6. Multiplication Properties 7. 3, 4, 6, 7, and 8 as Factors 8. Multiplication as Comparison 9. Meanings of Division 10. Algebra Connections 11. Multiplication and Division Comparison Problems	• Teacher observation • Independent practice • Topic test • Performance task

and observe that the terms	12. Special Quotients	

appear to alternate between odd and even numbers. •Compose equations from information supplied in word problems, using letters to represent unknowns in formulas, and solve the word problems (with all four operations). •Write an equation to identify the arithmetic operation written in a word problem (without solving). •Multiply or divide to solve word problems involving multiplicative comparisons. •Write multiplication equations from multiplicative comparisons given in words (example, 35 is 5 times as many as 7 and 7 times as many as 5) and describe a multiplication equation in words.	13. Using Multiplication Facts to Find Division Facts 14. Problem Solving: Draw a Picture and Write an Equation 15. Reteaching 16. Topic 1 Test 17. Performance Task	

Differentiation

- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Topic 2											
Content Area: Mathematics											
Title: Generate and Analyze Patterns										**14 days**	
Topic Components											
21st Century Themes											
	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy		
21st Century Skills											
	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration				
Interdisciplinary Connections: Science, Social Studies, Physical Education, Writing											
Integration of Technology: Digital resources are part of this textbook series.											
Equipment needed: pattern blocks, base ten blocks, counters **Vocabulary:** ● repeating pattern											

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: •Generate number or shape patterns by using rules including words, models, or graphs, and identify apparent features of the pattern that were not explicit in the rule of the original pattern. 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. •Compose equations from	1. Review What You Know! 2. Interactive Learning 3. Repeating Patterns 4. Number Sequences 5. Extending Tables 6. Writing Rules for Situations 7. Mixed Problem Solving 8. Geometric Patterns 9. Problem Solving: Act It Out and Use Reasoning 10. Going Digital 11. Reteaching 12. Topic 2 Test 13. Performance Task	● Teacher observation ● Independent practice ● Topic test ● Performance task

information supplied in word problems, using		

letters to represent unknowns in formulas, and solve the word problems (with all four operations).		

Differentiation

- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Unit Overview

Content Area: Mathematics

Unit Title: Number and Operations in Base Ten

Grade Level: Grade 4

Unit Summary

Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi- digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.

Source: The introduction to the Common Core Standard for Mathematics. Retrieved from http://www.corestandards.org/Math/Content/3/introduction/

Primary interdisciplinary connections: Science, Social Studies, Physical Education, Writing

21st century themes:

- Critical Thinking/Problem Solving
- Communication
- Collaboration

Unit Rationale

A firm grounding in the big picture of how operations with numbers interrelate and how they are vital tools in life can help students build the positive attitudes that will help them become confident, efficient, and effective problem-solvers (McConnell, 2011)

Algebraic thinking develops problem-solving skills. Students must analyze what they know and don't know about a problem, determine a method for finding solutions, and check results for accuracy. Algebra provides students with resources for dealing with real-world situations in a "systematic, analytic manner." (McConnell, 2011)

Learning Targets

Standards

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.

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.

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.

Content Statements

- Generalize place value understanding for multi-digit whole numbers.
- Use place value understanding and properties of operations to perform multi-digit arithmetic.
- Use the four operations with whole numbers to solve problems.

Indicators	
4.NBT.A.1	Explain the quantitative relationship between places of a multi-digit whole number up to one million when moving from right to left.
4.NBT.A.2	Compare numbers using >, =, and < for two multi-digit whole numbers up to one million (presented as base ten numerals, number names, or expanded form).
4.NBT.A.3	Round multi-digit whole numbers up to one million to any place.
4.NBT.A.4	Add and subtract two multi-digit whole numbers using the standard algorithm fluently (with speed and accuracy) without a calculator.
4.NBT.A.5	Use strategies to multiply multi-digit numbers and explain the answer using equations, rectangular arrays, and area models (up to 4-digits by 1-digit or 2-digits by 2-digits).
4.NBT.A.6	Use strategies to divide multi-digit dividends by one-digit divisors and explain the answer using equations, rectangular arrays, and area models
4.OA.A.2	•Multiply or divide to solve word problems involving multiplicative comparisons. • Write an equation to identify the arithmetic operation written in a word problem (without solving).
4.OA.A.3	Compose equations from information supplied in word problems, using letters to represent unknowns in formulas, and solve the word problems (with all four operations).

Unit Essential Questions

- **Topic 3**
  - How are greater numbers read and written?
  - How can whole numbers be compared and ordered?

Unit Enduring Understandings

- One representation may sometimes be more helpful than another; and, used together, multiple representations give a fuller understanding of a problem
- A quantity can be represented numerically in

	various ways. Problem solving depends upon

- **Topic 4**
  - How can sums and differences of whole numbers be estimated?
  - What are standard procedures for adding and subtracting whole numbers?
- **Topic 5**
  - How can some products be found mentally?
  - How can products be estimated?
- **Topic 6**
  - How can arrays be used to find products?
  - What is a standard procedure for multiplying multi-digit numbers?
- **Topic 7**
  - How can grater products be found mentally?
  - How can greater products be estimated?
- **Topic 8**
  - How can arrays be used to find greater products?
  - What is a standard procedure for multiplying multi-digit numbers?
- **Topic 9**
  - What are different meanings of division?
  - How can mental math and estimation be used to divide?
- **Topic 10**
  - How can repeated subtraction be used to model division?
  - What is the standard procedure for dividing multi-digit numbers?

choosing wise ways.

- Numeric fluency includes both the understanding of, and the ability to, approximately use numbers.
- Computational fluency includes understanding the meaning and the appropriate use of numerical operations.
- The magnitude of numbers affects the outcome of operations on them.
- In many cases there are multiple algorithms for finding a mathematical solution, and those algorithms are frequently associated with different cultures.
- Context is critical when using estimation.
- The symbolic language of algebra is used to communicate and generalize the patterns in mathematics.
- Algebraic representation can be used to generalize patterns and relationships.
- Mathematical models can be used to describe and quantify physical relationships.
- Physical models can be used to clarify mathematical relationships.

(source: http://jaymctighe.com/wordpress/wp-content/uploads/2013/04/NEW-JERSEY-UbD-MAPS.pdf)

Unit Learning Targets

Students will ...

- Explain the quantitative relationship between places of a multi-digit whole number up to one million when moving from right to left.
- Compare numbers using >, =, and < for two multi-digit whole numbers up to one million (presented as base ten numerals, number names, or expanded form).
- Round multi-digit whole numbers up to one million to any place.
- Add and subtract two multi-digit whole numbers using the standard algorithm fluently (with speed and

4th Grade Wandell School Math Curricula

Aligned to the New Jersey Student Learning Standards

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accuracy) without a calculator.
- Compose equations from information supplied in word problems, using letters to represent unknowns in formulas, and solve the word problems (with all four operations).
- Use strategies to multiply multi-digit numbers and explain the answer using equations, rectangular arrays, and area models (up to 4-digits by 1-digit or 2-digits by 2-digits).
- Multiply or divide to solve word problems involving multiplicative comparisons.
- Write an equation to identify the arithmetic operation written in a word problem (without solving).
- Use strategies to divide multi-digit dividends by one-digit divisors and explain the answer using equations, rectangular arrays, and area models.

Evidence of Learning

Summative Assessment (at the end of each topic)

Each topic has a summative test and a performance task.

Equipment needed: see individual topics

Teacher Resources: *enVision Math Common Core: Realize Edition.* 2015

Formative Assessments

- teacher observation
- homework
- "Review What You Know"
- "Independent Practice"
- Topic performance task

Topics

Topic	Timeframe
Topic 3 *Place Value*	14 days
Topic 4 *Addition and Subtraction of Whole Numbers*	14 days
Topic 5 *Number Sense: Multiplying by 1-Digit Numbers*	14 days
Topic 6 *Developing Fluency: Multiplying by 1-Digit Numbers*	14 days
Topic 7 *Number Sense: Multiplying by 2-Digit Numbers*	14 days
Topic 8 *Developing Fluency: Multiplying by 2-Digit Numbers*	14 days
Topic 9 *Number Sense: Dividing by 1-Digit Divisors*	14 days
Topic 10 *Developing Fluency: Dividing by 1-Digit Divisors*	14 days

Teacher Notes:
This unit consists of eight topics from the *enVision Math* series with anywhere from 5 to 7

lessons per topic. These eight topics address the Number and Operations in Base Ten and Operations and Algebraic Thinking domains of the Common Core Standards for Mathematics for Grade 4 students. In addition, these eight topics address all eight of the Standards for Mathematical Practice.

Essential questions were taken directly from the textbook series used by the district, *enVision Math: Realize Edition.*

Enduring understandings were taken from *Overarching Understandings and Essential Questions (New Jersey)* at http://jaymctighe.com/resources/downloads/

Curriculum Development Resources

Click the links below to access additional resources used to design this unit:

NJDOE. "Model Curriculum: Mathematics (K-12) - Grade 4." Model Curriculum: Mathematics (K-12) - Grade 4. New Jersey Dept. of Education, n.d. Web. 27 June 2015. <http://www.state.nj.us/education/modelcurriculum/math/1.shtml>.

Charles, Randall. *enVision Math Common Core*. Realize ed. Grade 4. Upper Saddle River: Pearson Education, 2015. Print. enVision Math

McConnell, Carolyn. *The Essential Questions Handbook*. New York: Scholastic, 2011. Print.

Topic 3												
Content Area: Mathematics												
Title: Place Value											**14 days**	
Topic Components												
21st Century Themes												
	Global Awareness	X	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy			
21st Century Skills												
	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration					
Interdisciplinary Connections: Science, Social Studies, Physical Education, Writing												
Integration of Technology: Digital resources are part of this textbook series.												
Equipment needed: base ten blocks, place value chart, number line **Vocabulary:**												

4th Grade Wandell School Math Curricula

Aligned to the New Jersey Student Learning Standards

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

- place value
- standard form
- expanded form
- word form
- compare

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: •Explain the quantitative relationship between places of a multi-digit whole number up to one million when moving from right to left. •Compare numbers using >, =, and < for two multi-digit whole numbers up to one million (presented as base ten numerals, number names, or expanded form). •Round multi-digit whole numbers up to one million to any place.	1. Review What You Know! 2. Interactive Learning 3. Representing Numbers 4. Place Value Relationships 5. Comparing Numbers 6. Algebra Connections 7. Comparing Greater Numbers 8. Rounding Whole Numbers 9. Problem Solving: Make an Organized List 10. Reteaching 11. Topic 3 Test 12. Performance Task	• Teacher observation • Independent practice • Topic test • Performance task

Differentiation

- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Topic 4									
Content Area: Mathematics									
Title: Addition and Subtraction of Whole Numbers								**14 days**	
Topic Components									
21st Century Themes									
	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy
21st Century Skills									
	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration		
Interdisciplinary Connections: Science, Social Studies, Physical Education, Writing									
Integration of Technology: Digital resources are part of this textbook series.									
Equipment needed: base ten blocks **Vocabulary:** • breaking apart • compensation • counting on • inverse operations									

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: •Add and subtract two multi-digit whole numbers using the standard algorithm fluently (with speed and accuracy) without a calculator. •Compose equations from information supplied in word problems, using letters to represent	1. Review What You Know! 2. Interactive Learning 3. Using Mental Math to Add and Subtract 4. Algebra Connections 5. Estimating Sums and Differences of Whole Numbers 6. Adding Whole Numbers 7. Stop and Practice 8. Subtracting Whole Numbers 9. Subtracting Across Zeros 10. Problem Solving: Draw a Picture and Write	• Teacher observation • Independent practice • Topic test • Performance task

unknowns in formulas,		

and solve the word problems (with all four operations).	an Equation 11. Going Digital 12. Reteaching 13. Topic 4 Task 14. Performance Task	

Differentiation

- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Topic 5									
Content Area: Mathematics									
Title: Number Sense: Multiplying by 1-Digit Numbers								**14 days**	
Topic Components									
21st Century Themes									
	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy
21st Century Skills									
	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration		
Interdisciplinary Connections: Science, Social Studies, Physical Education, Writing									
Integration of Technology: Digital resources are part of this textbook series.									
Equipment needed: grid paper, base ten blocks **Vocabulary:** • partial products • compensation									

4th Grade Wandell School Math Curricula

Aligned to the New Jersey Student Learning Standards

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Goals/Objectives	Topic Sequence	Formative Assessment Tasks

Students: •Round multi-digit whole numbers up to one million to any place. •Use strategies to multiply multi-digit numbers and explain the answer using equations, rectangular arrays, and area models (up to 4-digits by 1-digit or 2-digits by 2-digits). •Compose equations from information supplied in word problems, using letters to represent unknowns in formulas, and solve the word problems (with all four operations).	1. Review What You Know! 2. Interactive Learning 3. Arrays and Multiplying by 10 and 100 4. Multiplying by Multiples of 10 and 100 5. Breaking Apart to Multiply 6. Using Mental Math to Multiply 7. Using Rounding to Estimate 8. Problem Solving: Reasonableness 9. Going Digital 10. Reteaching 11. Topic 5 Test 12. Performance Task	• Teacher observation • Independent practice • Topic test • Performance task

Differentiation

- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Topic 6									
Content Area: Mathematics									
Title: Developing Fluency: Multiplying by 1-Digit Numbers								**14 days**	
Topic Components									
21st Century Themes									
	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy

21st Century Skills

	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration

Interdisciplinary Connections: Social Studies, Science, Physical Education, Writing

Integration of Technology: Digital resources are part of this textbook series.

Equipment needed: base ten blocks

Vocabulary:

- no new vocabulary

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: •Round multi-digit whole numbers up to one million to any place. •Use strategies to multiply multi-digit numbers and explain the answer using equations, rectangular arrays, and area models (up to 4-digits by 1-digit or 2-digits by 2-digits). •Multiply or divide to solve word problems involving multiplicative comparisons. •Write an equation to identify the arithmetic operation written in a word problem (without solving). •Compose equations from information supplied in word problems, using letters to represent unknowns in formulas, and solve the word problems (with all four operations).	1. Review What You Know! 2. Interactive Learning 3. Arrays and Using an Expanded Algorithm 4. Stop and Practice 5. Connecting the Expanded and Standard Algorithms 6. Multiplying 2-Digit by 1-Digit Numbers 7. Algebra Connections 8. Multiplying 3- and 4-Digit by 1-Digit Numbers 9. Stop and Practice 10. Multiplying by 1-Digit Numbers 11. Problem Solving: Missing or Extra Information 12. Going Digital 13. Reteaching 14. Topic 6 Test 15. Performance Task	• Teacher observation • Independent practice • Topic test • Performance task

Differentiation

- differentiated worksheets/activities for each lesson

- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Topic 7									
Content Area: Mathematics									
Title: Number Sense: Multiplying by 2-Digit Numbers								**14 days**	
Topic Components									
21st Century Themes									
	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy
21st Century Skills									
	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration		
Interdisciplinary Connections: Social Studies, Science, Physical Education, Writing									
Integration of Technology: Digital resources are part of this textbook series.									
Equipment needed: base ten blocks **Vocabulary:** • compatible numbers									

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: •Round multi-digit whole numbers up to one million to any place. •Use strategies to multiply multi-digit numbers and explain the answer using	1. Review What You Know! 2. Interactive Learning 3. Arrays and Multiplying 2-Digit Numbers by Multiples of 10 4. Going Digital 5. Using Mental Math to Multiply 2-Digit Numbers	• Teacher observation • Independent practice • Topic test • Performance task

equations, rectangular		

arrays, and area models (up to 4-digits by 1-digit or 2-digits by 2-digits). •Compose equations from information supplied in word problems, using letters to represent unknowns in formulas, and solve the word problems (with all four operations).	6. Using Rounding to Estimate 7. Using Compatible Numbers to Estimate 8. Problem Solving: Multiple-Step Problems 9. Reteaching 10. Topic 7 Test 11. Performance Task	

Differentiation

- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Topic 8									
Content Area: Mathematics									
Title: Developing Fluency: Multiplying by 2-Digit Numbers								**14 days**	
Topic Components									
21st Century Themes									
	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy
21st Century Skills									
	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration		
Interdisciplinary Connections: Science, Social Studies, Physical Education, Writing									
Integration of Technology: Digital resources are part of this textbook series.									

Equipment needed: grid paper

Vocabulary:
- no new vocabulary

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: •Use strategies to multiply multi-digit numbers and explain the answer using equations, rectangular arrays, and area models (up to 4-digits by 1-digit or 2-digits by 2-digits). •Compose equations from information supplied in word problems, using letters to represent unknowns in formulas, and solve the word problems (with all four operations).	1. Review What You Know! 2. Interactive Learning 3. Arrays and Multiplying 2-Digit Numbers 4. Arrays and an Expanded Algorithm 5. Multiplying 2-Digit Numbers by Multiples of 10 6. Multiplying 2-Digit by 2-Digit Numbers 7. Problem Solving: Two-Question Problems 8. Reteaching 9. Topic 8 Test 10. Performance Task	• Teacher observation • Independent practice • Topic test • Performance task

Differentiation
- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Topic 9	
Content Area: Mathematics	
Title: Number Sense: Dividing by 1-Digit Divisors	**14 days**
Topic Components	
21st Century Themes	

	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy

21st Century Skills							
	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration

Interdisciplinary Connections: Social Studies, Science, Physical Education, Writing

Integration of Technology: Digital resources are part of this textbook series.

Equipment needed: counters

Vocabulary:
- remainder

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: •Use strategies to multiply multi-digit numbers and explain the answer using equations, rectangular arrays, and area models (up to 4-digits by 1-digit or 2-digits by 2-digits). •Use strategies to divide multi-digit dividends by one-digit divisors and explain the answer using equations, rectangular arrays, and area models. •Compose equations from information supplied in word problems, using letters to represent unknowns in formulas, and solve the word problems (with all four operations).	1. Review What You Know! 2. Interactive Learning 3. Using Mental Math to Divide 4. Estimating Quotients 5. Estimating Quotients for Greater Dividends 6. Dividing with Remainders 7. Multiplication and Division Stories 8. Algebra Connections 9. Problem Solving: Draw a Picture and Write an Equation 10. Reteaching 11. Topic 9 Test 12. Performance Task	• Teacher observation • Independent practice • Topic test • Performance task

Differentiation
- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Topic 10											
Content Area: Mathematics											
Title: Developing Fluency: Dividing by 1-Digit Divisors										**14 days**	
Topic Components											
21st Century Themes											
	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy		
21st Century Skills											
	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration				
Interdisciplinary Connections: Social Studies, Science, Physical Education, Writing											
Integration of Technology: Digital resources are part of this textbook series.											
Equipment needed: base ten blocks **Vocabulary:** no new vocabulary											

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: •Use strategies to multiply multi-digit numbers and explain the answer using equations, rectangular arrays, and area models (up to 4-digits by 1-digit or 2-digits by 2-digits). •Use strategies to divide multi-digit dividends by	1. Review What You Know! 2. Interactive Learning 3. Division as Repeated Subtraction 4. Using Objects to Divide: Division as Sharing 5. Enrichment 6. Dividing 2-Digit by 1-Digit Numbers 7. Enrichment 8. Dividing 3-Digit by 1-Digit Numbers	• Teacher observation • Independent practice • Topic test • Performance task

one-digit divisors and	9. Deciding Where to Start Dividing	

explain the answer using equations, rectangular arrays, and area models. •Compose equations from information supplied in word problems, using letters to represent unknowns in formulas, and solve the word problems (with all four operations).	10. Dividing 4-Digit by 1-Digit Numbers 11. Problem Solving: Multiple-Step Problems 12. Reteaching 13. Topic 10 Test 14. Performance Task	

Differentiation

- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Unit Overview

Content Area: Mathematics

Unit Title: Number and Operations – Fractions

Grade Level: Grade 4

Unit Summary

Students develop understanding of fraction equivalence and operations with fractions. They recognize that two different fractions can be equal (e.g., 15/9 = 5/3), and they develop methods for generating and recognizing equivalent fractions. Students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.

Source: The introduction to the Common Core Standard for Mathematics. Retrieved from http://www.corestandards.org/Math/Content/3/introduction/

Primary interdisciplinary connections: Science, Social Studies, Physical Education, Writing

21st century themes:

- Critical Thinking/Problem Solving
- Communication

- Collaboration

Unit Rationale

Although students come to the topic of fractions with an understanding of what it means to share, fractions present difficulties for many students. Using their own experiences, students build conceptual knowledge of how numbers relate, how to divide a whole, how to manipulate fractions and how to "express and picture the same quantities in a variety of ways." (McConnell, 2011)

Learning Targets

Standards

- 4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
- 4.NF.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.
- 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.NF.B.4a Understand a fraction a/b as a multiple of $1/b$. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*
- 4.NF.B.4b Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)*
- 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.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 100.2 *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.*
- 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.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.

4th Grade Wandell School Math Curricula

Aligned to the New Jersey Student Learning Standards

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

- 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.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.

Content Statements

- Extend understanding of fraction equivalence and ordering.
- Build fractions from unit fractions.
- Understand decimal notation for fractions, and compare decimal fractions.
- Solve problems involving measurement and conversion of measurements.
- Gain familiarity with factors and multiples.

Indicator	
4.NF.A.1	Recognize and generate equivalent fractions and explain why they are equivalent using visual fraction models
4.NF.A.2	Compare two fractions with different numerators and different denominators using >, <, and = and justify the comparison by using visual fraction models (recognizing the comparison is valid only when two fractions refer to the same whole).
4.NF.B.3a 4.NF.B.3b	Decompose a fraction into a sum of fractions with the same denominator in more than one way; record the decomposition as an equation and justify with a visual fraction model.
4.NF.B.3c	Add and subtract mixed numbers with like denominators by replacing each mixed number with an equivalent fraction.
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.4a 4.NF.B.4b	Multiply a fraction by a whole number using visual fraction models and equations, demonstrating a fraction **a/b** as a multiple of 1/**b**.
4.NF.B.4c	Solve 1-step word problems involving multiplication of a fraction by a whole number. *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.5	Add two fractions with respective denominators of 10 and 100 by writing each fraction as a fraction with denominator 100
4.NF.C.6	Use decimal notation to write fractions with denominators of 10 or 100 by writing each fraction as a fraction with denominator 100.
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.MD.A.2	Solve word problems involving simple fractions or decimals that incorporate measurement

4th Grade Wandell School Math Curricula

Aligned to the New Jersey Student Learning Standards

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

& 4.NF.B.4	comparisons of like units (including problems that require 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.B.4	Find all factor pairs for a whole number up to 100 and determine whether it is a multiple of a given 1-digit whole number. Determine whether a given whole number in the range of 1-100 is a prime number.

Unit Essential Questions

- **Topic 11**
  - How can we compare and contrast numbers?
- **Topic 12**
  - What does it mean to add and subtract fractions and mixed numbers with like denominators?
  - What is a standard procedure for adding and subtracting fractions and mixed numbers with like denominators?
  - How can fractions and mixed numbers be added and subtracted on a number line?
- **Topic 13**
  - How is decimal numeration related to whole number numeration?
  - How can decimals be compared and ordered?
  - How are fractions and decimals related?

Unit Enduring Understandings

- One representation may sometimes be more helpful than another; and, used together, multiple representations give a fuller understanding of a problem.
- A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways.
- Numeric fluency includes both the understanding of and the ability to appropriately use numbers.
- Computational fluency includes understanding the meaning and the appropriate use of numerical operations.
- The magnitude of numbers affects the outcome of operations on them.
- In many cases, there are multiple algorithms for finding a mathematical solution, and those algorithms are frequently associated with different cultures.
- Context is critical when using estimation.
- Everyday objects have a variety of attributes, each of which can be measured in many ways.
- What we measure affects how we measure it.
- Measurements can be used to describe, compare, and make sense of phenomena.

(source: http://jaymctighe.com/wordpress/wp-content/uploads/2013/04/NEW-JERSEY-UbD-MAPS.pdf)

Unit Learning Targets

Students will ...

- Recognize and generate equivalent fractions and explain why they are equivalent using visual fraction models.
- Compare two fractions with different numerators and different denominators using >, <, and = and justify the comparison by using visual fraction models (recognizing the comparison is valid only when two fractions refer to the same whole).
- Decompose a fraction into a sum of fractions with the same denominator in more than one way; record the decomposition as an equation and justify with a visual fraction model.
- Add and subtract mixed numbers with like denominators by replacing each mixed number with an equivalent fraction.
- 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.

- Multiply a fraction by a whole number using visual fraction models and equations, demonstrating a fraction **a/b** as a multiple of 1/**b.**
- Solve 1-step word problems involving multiplication of a fraction by a whole number. *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?*
- Add two fractions with respective denominators of 10 and 100 by writing each fraction as a fraction with denominator 100.
- Use decimal notation to write fractions with denominators of 10 or 100 by writing each fraction as a fraction with denominator 100.
- 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.
- Solve word problems involving simple fractions or decimals that incorporate measurement comparisons of like units (including problems that require measurements given in a larger unit in terms of a smaller unit).
- Find all factor pairs for a whole number up to 100 and determine whether it is a multiple of a given 1-digit whole number.

Evidence of Learning

Summative Assessment (at the end of each topic)
Each topic has a summative test and a performance task.

Equipment needed: see individual topics

Teacher Resources: *enVision Math Common Core: Realize Edition.* 2015

Formative Assessments

- teacher observation
- homework
- "Review What You Know"
- "Independent Practice"
- Topic performance task

Topics

Topic	Timeframe
Topic 11 *Fraction Equivalence and Ordering*	14 days
Topic 12 *Adding and Subtracting Fractions and Mixed Numbers with Like Denominators*	14 days
Topic 13 *Extending Fraction Concepts*	14 days

Teacher Notes:
This unit consists of three topics from the *enVision Math* series with anywhere from 8 to 11 lessons per topic. These three topics address the Number and Operations – Fractions domain of the standards for Mathematics for Grade 4 students. In addition, these three topics address all eight of the Standards for Mathematical Practice.

Essential questions were taken directly from the textbook series used by the district, *enVision Math: Realize Edition.*

Enduring understandings were taken from *Overarching Understandings and Essential Questions (New Jersey)* at http://jaymctighe.com/resources/downloads/

Curriculum Development Resources

Click the links below to access additional resources used to design this unit:

NJDOE. "Model Curriculum: Mathematics (K-12) - Grade 4." Model Curriculum: Mathematics (K-12) - Grade 4. New Jersey Dept. of Education, n.d. Web. 27 June 2015. <http://www.state.nj.us/education/modelcurriculum/math/1.shtml>.

Charles, Randall. *enVision Math Common Core*. Realize ed. Grade 4. Upper Saddle River: Pearson Education, 2015. Print. enVision Math Common Core

McConnell, Carolyn. *The Essential Questions Handbook*. New York: Scholastic, 2011. Print.

Topic 11											
Content Area: Mathematics											
Title: Fraction Equivalence and Ordering									**14 days**		
Topic Components											
21st Century Themes											
	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy		
21st Century Skills											
	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration				
Interdisciplinary Connections: Science, Social Studies, Physical Education, Writing											
Integration of Technology: Digital resources are part of this textbook series.											
Equipment needed: **Vocabulary:**											

4th Grade Wandell School Math Curricula

Aligned to the New Jersey Student Learning Standards

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: •Recognize and generate equivalent fractions and explain why they are equivalent using visual fraction models • Compare two fractions with different numerators and different denominators using >, <, and = and justify the comparison by using visual fraction models (recognizing the comparison is valid only when two fractions refer to the same whole). • Determine if a number between 1 and 100 is a prime or composite number. • Find all factor pairs for a whole number up to 100 and determine whether it is a multiple of a given 1-digit whole number.	1. Review What You Know! 2. Interactive Learning 3. Factors 4. Prime and Composite Numbers 5. Multiples 6. Equivalent Fractions 7. Going Digital 8. Number Lines and Equivalent Fractions 9. Comparing Fractions 10. Mixed Problem Solving 11. Ordering Fractions 12. Problem Solving: Writing to Explain 13. Going Digital 14. Reteaching 15. Topic 11 Test 16. Performance Task	• Teacher observation • Independent practice • Topic test • Performance task

Differentiation

- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Topic 12

Content Area: Mathematics											
Title: Adding and Subtracting Fractions and Mixed Numbers with Like Denominators									**14 days**		
Topic Components											
21st Century Themes											
	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy		
21st Century Skills											
	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration				
Interdisciplinary Connections: Science, Social Studies, Physical Education, Writing											
Integration of Technology: Digital resources are part of this textbook series.											
Equipment needed: fraction tiles, number line **Vocabulary:** ● mixed number ● improper fraction											

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: • Decompose a fraction into a sum of fractions with the same denominator in more than one way; record the decomposition as an equation and justify with a visual fraction model. • Add and subtract mixed numbers with like denominators by replacing each mixed number with an equivalent fraction. • Solve word problems involving addition and subtraction of fractions referring to the same	1. Review What You Know! 2. Interactive Learning 3. Modeling Addition of Fractions 4. Adding Fractions with Like Denominators 5. Modeling Subtraction of Fractions 6. Subtracting Fractions with Like Denominators 7. Adding and Subtracting on the Number Line 8. Algebra Connections 9. Improper Fractions and Mixed Numbers 10. Mixed Problem Solving 11. Modeling Addition and Subtraction of Mixed Numbers 12. Mixed Problem Solving 13. Adding Mixed Numbers 14. Subtracting Mixed Numbers	● Teacher observation ● Independent practice ● Topic test ● Performance task

whole and having like		

denominators, e.g., by using visual fraction models and equations to represent the problem.	15. Decomposing and Composing Fractions 16. Problem Solving: Draw a Picture and Write an Equation 17. Algebra Connections 18. Reteaching 19. Topic 12 Test 20. Performance Task	

Differentiation

- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Topic 13

Content Area: Mathematics

Title: Extending Fraction Concepts	**14 days**

Topic Components

21st Century Themes

	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy

21st Century Skills

	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration

Interdisciplinary Connections:

Integration of Technology: Digital resources are part of this textbook series.

Equipment needed: fraction tiles, tenths grids, grid paper, number line, ruler

Vocabulary:

- unit fraction
- tenth

4th Grade Wandell School Math Curricula

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- hundredth
- decimal point

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: • Multiply a fraction by a whole number using visual fraction models and equations, demonstrating a fraction **a/b** as a multiple of 1/**b**. • Solve 1-step word problems involving multiplication of a fraction by a whole number. *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?* • Add two fractions with respective denominators of 10 and 100 by writing each fraction as a fraction with denominator 100. • Use decimal notation to write fractions with denominators of 10 or 100 by writing each fraction as a fraction with denominator 100 • Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same	1. Review What You Know! 2. Interactive Learning 3. Fractions as Multiples of Unit Fractions: Using Models 4. Multiplying a Fraction by a Whole Number: Using Models 5. Multiplying a Fraction by a Whole Number: Using Symbols 6. Fractions and Decimals 7. Fractions and Decimals on the Number Line 8. Stop and Practice 9. Equivalent Fractions and Decimals 10. Stop and Practice 11. Decimal Place Value 12. Comparing Decimals 13. Algebra Connections 14. Using Money to Understand Decimals 15. Problem Solving: Draw a Picture 16. Reteaching 17. Topic 13 Test 18. Performance Task	• Teacher observation • Independent practice • Topic test • Performance task

whole. Record the results of comparisons with the		

symbols >, =, or <, and justify the conclusions, e.g., by using a visual model. • Solve word problems involving simple fractions or decimals that incorporate measurement comparisons of like units (including problems that require measurements given in a larger unit in terms of a smaller unit)		

Differentiation

- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Unit Overview

Content Area: Mathematics

Unit Title: Measurement and Data

Grade Level: Grade 4

Unit Summary

When we measure anything, we do it in human-defined 'units'. Different units were defined in different places and for different scales. The two most common are U.S. customary units and metric units. Students learn how to convert among them and use units to solve problems including problems with area and perimeter.

(source: https://www.khanacademy.org/math/cc-fourth-grade-math/cc-4th-measurement-topic)

Primary interdisciplinary connections: Science, Social Studies, Physical Education, Writing

21st century themes:

- Critical Thinking/Problem Solving
- Communication
- Collaboration

Unit Rationale

A firm grounding in the big picture of how operations with numbers interrelate and how they are vital tools in life can help students build the positive attitudes that will help them become confident, efficient, and effective problem-solvers (McConnell, 2011)

An accurate and consistent system of measurement is a foundation of our economy and necessary for interaction with others around the globe. Systems of measurement facilitate communication in all aspects of life. (McConnell, 2011)

Learning Targets

Standards

- 4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *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.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*.
- 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*.

Content Statements

- Solve problems involving measurement and conversion of measurements.

Indicator	
4.MD.A.1	Express measurement comparisons within a single system of measurement and record in a two- column chart within a single system of measurement; e.*g., know that 1 ft. is 12 times as long as 1 in.*
4.MD.A.2	Solve word problems involving simple fractions or decimals that incorporate measurement comparisons of like units (including problems that require measurements given in a larger unit in terms of a smaller unit).
4.MD.A.3	Apply area and perimeter formulas for rectangles in real world math problems (whole numbers).
4.MD.B.4	Make a line plot to display a data set in measurements in fractions of a unit (1/2, 1/4, 1/8) and use it to solve problems involving addition and subtraction of fractions with like denominators.

Unit Essential Questions

- **Topic 14**
  - What are customary and metric units for measuring length, capacity, and weight/mass, and how are they related?
- **Topic 15**
  - What do area and perimeter mean and how can each be found?
  - How can line plots and other tools help to solve measurement problems?

Unit Enduring Understandings

- Everyday objects have a variety of attributes, each of which can be measured in many ways.
- What we measure affects how we measure it.
- Measurements can be used to describe, compare, and make sense of phenomena.
- The message conveyed by the data depends on how the data is collected, represented, and summarized.

(source: http://jaymctighe.com/wordpress/wp-content/uploads/2013/04/NEW-JERSEY-UbD-MAPS.pdf)

Unit Learning Targets

Students will ...

- Express measurement comparisons within a single system of measurement and record in a two- column chart within a single system of measurement; e.*g., know that 1 ft. is 12 times as long as 1 in.*
- Solve word problems involving simple fractions or decimals that incorporate measurement comparisons

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of like units (including problems that require measurements given in a larger unit in terms of a smaller unit).
- Apply area and perimeter formulas for rectangles in real world math problems (whole numbers).
- Make a line plot to display a data set in measurements in fractions of a unit (1/2, 1/4, 1/8) and use it to solve problems involving addition and subtraction of fractions with like denominators.

Evidence of Learning

Summative Assessment (at the end of each topic)
Each topic has a summative test and a performance task.

Equipment needed: see individual topics

Teacher Resources: *enVision Math Common Core: Realize Edition.* 2015

Formative Assessments

- teacher observation
- homework
- "Review What You Know"
- "Independent Practice"
- Topic performance task

Topics

Topic	Timeframe
Topic 14 *Measurement Units and Conversions*	14 days
Topic 15 *Solving Measurement and Data Problems*	14 days

Teacher Notes:
This unit consists of two topics from the *enVision Math* series with anywhere from 6 to 11 lessons per topic. These two topics address the Measurement and Data domain of the Common Core Standards for Mathematics for Grade 4 students. In addition, these two topics address all eight of the Standards for Mathematical Practice.

Essential questions were taken directly from the textbook series used by the district, *enVision Math: Realize Edition.*

Enduring understandings were taken from *Overarching Understandings and Essential Questions (New Jersey)* at http://jaymctighe.com/resources/downloads/

Curriculum Development Resources
Click the links below to access additional resources used to design this unit:

NJDOE. "Model Curriculum: Mathematics (K-12) - Grade 4." Model Curriculum: Mathematics (K-12) - Grade 4. New Jersey Dept. of Education, n.d. Web. 27 June 2015. <http://www.state.nj.us/education/modelcurriculum/math/1.shtml>.

Charles, Randall. *enVision Math Common Core*. Realize ed. Grade 4. Upper Saddle River: Pearson

4th Grade Wandell School Math Curricula

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Education, 2015. Print. enVision Math Common Core

McConnell, Carolyn. *The Essential Questions Handbook*. New York: Scholastic, 2011. Print.

Topic 14									
Content Area: Mathematics									
Title: Measurement Units and Conversions								**14 days**	
Topic Components									
21st Century Themes									
	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy
21st Century Skills									
	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration		
Interdisciplinary Connections: Science, Social Studies, Physical Education, Writing									
Integration of Technology: Digital resources are part of this textbook series.									

Equipment needed: ruler, empty liquid containers of varying sizes, grid paper, base ten blocks

Vocabulary:

- inch
- foot (ft)
- yard (yd)
- mile (mi)
- capacity
- weight
- ounce (oz)
- pound (lb)
- ton (T)
- centimeter
- millimeter
- decimeter
- meter
- kilometer

4th Grade Wandell School Math Curricula

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- milliliter
- liter
- gram
- kilogram

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: • Solve word problems involving simple fractions or decimals that incorporate measurement comparisons of like units (including problems that require measurements given in a larger unit in terms of a smaller unit). • Express measurement comparisons within a single system of measurement and record in a two- column chart within a single system of measurement; e.*g., know that 1 ft. is 12 times as long as 1 in.*	1. Review What You Know! 2. Interactive Learning 3. Using Customary Units of Length 4. Customary Units of Capacity 5. Units of Weight 6. Changing Customary Units 7. Stop and Practice 8. Problem Solving: Writing to Explain 9. Using Metric Units of Length 10. Metric Units of Capacity 11. Units of Mass 12. Changing Metric Units 13. Enrichment 14. Units of Time 15. Problem Solving: Work Backward 16. Reteaching 17. Topic 14 Test 18. Performance Task	• Teacher observation • Independent practice • Topic test • Performance task

Differentiation

- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

Topic 15									
Content Area: Mathematics									
Title: Solving Measurement and Data Problems								**14 days**	
Topic Components									
21st Century Themes									
	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy
21st Century Skills									
	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration		
Interdisciplinary Connections: Science, Social Studies, Physical Education, Writing									
Integration of Technology: Digital resources are part of this textbook series.									
Equipment needed: none **Vocabulary:** • line plot • perimeter • area									

Goals/Objectives	Topic Sequence	Formative Assessment Tasks

Students: • Express measurement comparisons within a single system of measurement and record in a two- column chart within a single system of measurement; e.*g., know*	1. Review What You Know! 2. Interactive Learning 3. Making Line Plots 4. Solving Problems Involving Line Plots 5. Solving Perimeter and Area Problems 6. Solving Measurement Problems 7. Solving Problems Involving Money	• Teacher observation • Independent practice • Topic test • Performance task

that 1 ft. is 12 times as long as 1 in. • Apply area and perimeter formulas for rectangles in real world math problems (whole numbers). • Apply area and perimeter formulas for rectangles in real world math problems (whole numbers).	8. Problem Solving: Solve a Simpler Problem and Make a Table 9. Going Digital 10. Reteaching 11. Topic 15 Test 12. Performance Task	
Differentiation ● differentiated worksheets/activities for each lesson ● leveled homework for each lesson ● reteaching resources at the end of each lesson		
Resources Provided *enVision Math Common Core: Realize Edition* teacher's guides, workbooks, digital resources, manipulatives		

Unit Overview
Content Area: Mathematics
Unit Title: Geometry
Grade Level: Grade 4

Unit Summary

Students describe, analyze, compare, and classify two-dimensional shapes. Through building, drawing, and analyzing two-dimensional shapes, students deepen their understanding of properties of two- dimensional objects and the use of them to solve problems involving symmetry.

Primary interdisciplinary connections: Science, Social Studies, Physical Education, Writing

21st century themes:

- Critical Thinking/Problem Solving
- Communication

- Collaboration

Unit Rationale

Geometric shapes are essential to many facets of our lives, from art to architecture. Learning the mathematical principles that are the basis for "creating, describing, classifying, and manipulating shapes can open up new world for students." (McConnell, 2011, pg 82).

A firm grounding in the big picture of how operations with numbers interrelate and how they are vital tools in life can help students build the positive attitudes that will help them become confident, efficient, and effective problem-solvers (McConnell, 2011)

An accurate and consistent system of measurement is a foundation of our economy and necessary for interaction with others around the globe. Systems of measurement facilitate communication in all aspects of life. (McConnell, 2011)

Learning Targets

Standards

- 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.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.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 measure.

Content Statements

- Draw and identify lines and angles, and classify shapes by properties of their lines and angles.
- Generate and analyze patterns.

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● Geometric measurement: understand concepts of angle and measure angles.	
Indicators	
4.G.A.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines and 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 specific size. Recognize right angles as a category, and identify right triangles.
4.G.A.3	Draw lines of symmetry and identify line-symmetric figures.
4.OA.C.5	Generate number or shape patterns by using rules including words, models, or graphs, and identify apparent features of the pattern that were not explicit in the rule of the original pattern. 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.
4.MD.C.5a 4.MD.C.5b	Determine the measure of an angle in degrees. The two rays of an angle share a common endpoint. If that endpoint is located at the center of a circle, the fraction of the circular arc (between the points where the rays intersect the circle) measures the angle in degrees. A "degree" is defined as 1/360 (one degree angle) of the entire circle; and an angle that turns **n** one degree angles is said to measure **n** degrees.
4.MD.C.6	Use a protractor to measure angles in whole number degrees and sketch angles of specific measures.
4.MD.C.7	Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems using a symbol for an unknown angle measure.

Unit Essential Questions

- **Topic 16**
  - How can lines, angles, and shapes be described, analyzed, and classified?
  - How are angles measured, added and subtracted?

Unit Enduring Understandings

- Geometric properties can be used to construct geometric figures.
- Geometric relationships provide a means to make sense of a variety of phenomena.
- What we measure affects how we measure it.
- Measurements can be used to describe, compare, and make sense of phenomena.

(source: http://jaymctighe.com/wordpress/wp-content/uploads/2013/04/NEW-JERSEY-UbD-MAPS.pdf)

Unit Learning Targets

Students will ...

- Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines and identify these in two-dimensional figures.
- Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specific size. Recognize right angles as a category, and identify right triangles.
- Draw lines of symmetry and identify line-symmetric figures.
- Generate number or shape patterns by using rules including words, models, or graphs, and identify

apparent features of the pattern that were not explicit in the rule of the original pattern. 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.

- Determine the measure of an angle in degrees. The two rays of an angle share a common endpoint. If that endpoint is located at the center of a circle, the fraction of the circular arc (between the points where the rays intersect the circle) measures the angle in degrees. A "degree" is defined as 1/360 (one degree angle) of the entire circle; and an angle that turns ***n*** one degree angles is said to measure **n** degrees.
- Use a protractor to measure angles in whole number degrees and sketch angles of specific measures.
- Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems using a symbol for an unknown angle measure.

Evidence of Learning

Summative Assessment (at the end of each topic)

Each topic has a summative test and a performance task.

Equipment needed: see individual topics

Teacher Resources: *enVision Math Common Core: Realize Edition.* 2015

Formative Assessments

- teacher observation
- homework
- "Review What You Know"
- "Independent Practice"
- Topic performance task

Topics

Topic	Timeframe
Topic 16 *Lines, Angles, and Shapes*	14 days

Teacher Notes:

This unit consists of one topic from the *enVision Math* series with anywhere from 11 lessons in the topic. These topic addresses the Geometry and Measurement and Data standards for Mathematics for Grade 4 students. In addition, this topic addresses all eight of the Standards for Mathematical Practice.

Essential questions were taken directly from the textbook series used by the district, *enVision Math: Realize Edition.*

Enduring understandings were taken from *Overarching Understandings and Essential Questions (New Jersey)* at http://jaymctighe.com/resources/downloads/

Curriculum Development Resources

Click the links below to access additional resources used to design this unit:

NJDOE. "Model Curriculum: Mathematics (K-12) - Grade 4." Model Curriculum: Mathematics (K-12) - Grade 4. New Jersey Dept. of Education, n.d. Web. 27 June 2015. <http://www.state.nj.us/education/modelcurriculum/math/1.shtml>.

4th Grade Wandell School Math Curricula

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Charles, Randall. *enVision Math Common Core*. Realize ed. Grade 4. Upper Saddle River: Pearson Education, 2015. Print. enVision Math

McConnell, Carolyn. *The Essential Questions Handbook*. New York: Scholastic, 2011. Print.

Topic 16	
Content Area: Mathematics	
Title: Lines, Angles, and Shapes	**14 days**

Topic Components

21st Century Themes

	Global Awareness	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy		Environmental Literacy

21st Century Skills

	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication	x	Collaboration

Interdisciplinary Connections: Science, Social Studies, Physical Education, Writing

Integration of Technology: Digital resources are part of this textbook series.

Equipment needed: clock face, protractor, pattern blocks, right triangles

Vocabulary:

- point
- line
- plane
- parallel lines
- intersecting lines
- perpendicular lines
- line segment
- ray
- right angle
- acute angle
- obtuse angle
- straight angle
- side
- vertex
- triangle
- quadrilateral
- pentagon
- hexagon
- octagon
- equilateral triangle
- isosceles triangle
- scalene triangle
- right triangle
- acute triangle
- obtuse triangle
- rhombus
- trapezoid
- parallelogram

4th Grade Wandell School Math Curricula

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- unit angle
- degrees
- angle measure
- protractor
- polygon
- rectangle
- square
- symmetric
- line of symmetry

Goals/Objectives	Topic Sequence	Formative Assessment Tasks
Students: • Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines and identify these in two-dimensional figures. • Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specific size. Recognize right angles as a category, and identify right triangles. • Draw lines of symmetry and identify line-symmetric figures. • Generate number or	1. Review What You Know! 2. Interactive Learning 3. Points, Lines, and Planes 4. Line Segments, Rays, and Angles 5. Understanding Angles and Unit Angles 6. Measuring with Unit Angles 7. Measuring Angles 8. Adding and Subtracting Angle Measures 9. Polygons 10. Triangles 11. Quadrilaterals 12. Line Symmetry 13. Problem Solving: Make and Test Generalizations 14. Reteaching 15. Topic 16 Test 16. Performance Task	• Teacher observation • Independent practice • Topic test • Performance task

shape patterns by using rules including words, models, or graphs, and identify apparent features of the pattern that were not explicit in the rule of the original pattern. 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. • Determine the measure of an angle in degrees. The two rays of an angle share a common endpoint. If that endpoint is located at the center of a circle, the fraction of the circular arc (between the points where the rays intersect the circle) measures the angle in degrees. A "degree" is defined as 1/360 (one degree angle) of the entire circle; and an angle that turns **n** one degree angles is said to measure **n** degrees. • Use a protractor to measure angles in whole number degrees and sketch angles of specific measures. • Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems using a symbol for an unknown angle measure.		

Differentiation

- differentiated worksheets/activities for each lesson
- leveled homework for each lesson
- reteaching resources at the end of each lesson

Resources Provided

enVision Math Common Core: Realize Edition teacher's guides, workbooks, digital resources, manipulatives

LESSON REFLECTION

Reflect on the lesson you have developed and rate the degree to which the lesson ***Strongly, Moderately*** or ***Weakly*** meets the criteria below.

Lesson Activities:	**Strongly**	**Moderately**	**Weakly**
Are challenging and require higher order thinking and problem solving skills			
Allow for student choice			
Provide scaffolding for acquiring targeted knowledge/skills			
Integrate global perspectives			
Integrate 21st century skills			
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills			
Foster student use of technology as a tool to develop critical thinking, creativity and innovation skills			
Are varied to address different student learning styles and preferences			
Are differentiated based on student needs			
Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process			
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives			

Provide opportunities for student reflection and self-assessment			

Provide data to inform and adjust instruction to better meet the varying needs of learners

Curriculum Design Template	
Content Area:	
Course Title:	**Grade Level:**

Unit Plan 1	**Pacing Guide**
Unit Plan 1	**Pacing Guide**
Unit Plan 3	**Pacing Guide**
Unit Plan 4	**Pacing Guide**
Unit Plan 5	**Pacing Guide**
Unit Plan 6	**Pacing Guide**

4th Grade Wandell School Math Curricula

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Date Created:
Board Approved on: