

Kittatinny Regional Consortium

K-8 Mathematics Curriculum

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*** The cross-reference charts are available upon request ***

Section I

Narratives

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Philosophy

The educated person must possess and be able to apply mathematical competencies and reasoning skills to identify and to solve complex problems as a continually changing and technologically dependent society requires. As educators, parents, and citizens, we must make certain that today's students are mathematically educated and capable of approaching complex problems with confidence and competence. We are obligated to ensure that our students are mathematically efficient, and are capable of utilizing the latest technology available to access, analyze, and interpret data quickly and accurately.

In concert with the state and federal departments of education as well as the National Council of Teachers of Mathematics, it is our contention that the mathematics curriculum must be focused on problem solving, data manipulation, and the study of patterns. Our students must be able to exchange ideas as well as communicate with others mathematically, both orally and in writing. In order to accomplish this goal, students must possess a command of the vocabulary of mathematics to allow them to share their thinking about mathematical questions as well as the solutions to problems of varying levels of complexity.

Based on their work with the New Jersey Common Core State Standards (NJCCSS) and the curriculum contained within this document, the members of the mathematics curriculum committee of the Kittatinny Region believe that the curriculum presented for use in each grade level will prepare our students to meet the goals outlined above. Our main objective is to help our students appreciate and enjoy the power of becoming mathematically literate and competent. To that end, the committee members present the following goals with the expectation that they will guide the professional staff in their work as they strive to help their students achieve the goals of the Kittatinny Regional schools.

Goals of the Mathematics Curriculum

As a result of being active participants in the Kittatinny Region mathematics curriculum, students should be able to:

- Solve relatively complex mathematical problems
- Apply mathematical skills, concepts, and strategies to solve real-life problems
- Display and utilize mathematical reasoning skills
- Skillfully communicate mathematical ideas using appropriate, precise vocabulary
- Efficiently apply mathematical strategies to solve various problems
- Demonstrate mathematical competence and continuous growth on formal tests and alternate forms of assessment
- Display confidence when approaching mathematical problem-solving situations
- Display a continually increasing independence as they increase their knowledge of mathematics
- Effectively utilize current technology as a tool to assist in solving problems
- Appreciate and enjoy mathematics as a tool that will prove useful throughout life

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Curriculum Recommendations

In order to ensure the effectiveness of this program, students must:

- Write and discuss mathematics regularly and consistently within the program
- Understand and apply the concepts related to number sense, estimation, algebra, geometry, probability and statistics, and problem solving
- Routinely use calculators and manipulatives for exploration and reinforcement
- Use up-to-date technological tools, including mathematics software and computers in the classroom on a regular basis
- Self-assess and make necessary adjustments to improve their mathematical skills
- Work cooperatively in an efficient manner

Teachers should constantly strive toward achieving the following:

- Teach and emphasize the importance of mastering real-world problem solving skills
- Help students master those skills that result in effective problem solving
- Measure students' skills using a variety of assessment techniques, including performance-based assessment activities
- Follow this curriculum document, using published materials to support, not replace it
- Participate in appropriate professional development activities related to mathematics
- Use the latest technology available to support instruction

Section II

Curriculum Units

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Unit Overview

Content Area: Mathematics
Unit Number and Title: I. Counting and Cardinality
Grade Level: Kindergarten

Unit Summary:

- Know number names and the count sequence
- Count to tell the number of objects
- Compare numbers
- Use ordinal numbers to identify position

Primary Interdisciplinary Connections: Language Arts, Science, Social Studies,

21st Century Themes:

Global Awareness Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: K.CC – Counting and Cardinality

Standard #	Standard
K.CC.1	Count number names and the count sequence
K.CC.2	Count forward beginning from a given number within the known sequence
K.CC.3	Write number from 0 to 20. Represent a number of objects with a written number 0-20
K.CC.4	Understand the relationship between numbers and quantities and connect counting to cardinality
K.CC.4a	When counting objects say the number names in the standard order pairing each object with one and only one number name and each number name with one and only one object.
K.CC.4b	Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or order in which they were counted
K.CC.4c	Understand that each successive number name refers to a quantity that is one larger.
K.CC.5	Count to answer “how many?” questions about as many as 20 things arranged in a line, rectangular array or as many as 10 scattered objects; given a number from 1-20 count out that many objects
K.CC.6	Identify whether the number of objects in one group is greater than, less than or equal to the number of objects in another group
K.CC.7	Compare two number between 1 and 10 presented as written numerals

Unit Essential Questions:

- How do you know which number to write for a set of objects?

Unit Enduring Understandings:

- There is a unique symbol that goes with each number word.

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- How do you know the number of objects in a group and determine when to stop counting?
- How do you compare sets of objects?
- How can we use numbers to tell order or position?

- Counting tells how many are in a set no matter in which order the objects are counted. The last number said when counting is the total. Counting is cumulative.
- If you compare two groups of objects and the number of objects match, the groups have the same number of objects. If one group has items left over, that group has more. The other group has fewer objects.
- Ordinal numbers can be used to identify position/order in a row and can be identified by counting. Ordinal numbers are similar to number names.

Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Count to 100 by ones, twos, fives and tens
- Count forward beginning from a given number with the known sequence.
- Write numbers from 0 to 20 and represent a number of objects with a written numeral, with 0 representing a count of no objects.
- Understand the relationship between numbers and quantities and connect counting to cardinality.
 - Say the number names in standard order
 - Understand that the last number name said tells the number of objects counted, regardless of the objects' arrangement.
 - Each successive number name refers to a quantity of one more
- Count to answer "How many", up to 20 items arranged in any form, and also be able to count a select number of items
- Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group by matching and counting strategies
- Compare two numbers between 1 and 10 presented as written numerals.
- Use ordinal numbers to identify position in a row (1st through 10th)

Unit Vocabulary: compare, count on, digit, greater than, less than, order, skip count, zero

Evidence of Learning

Suggested Formative Assessment Activities:

- Discussion
- Modeling
- Use of manipulatives
- Role-play, act out problems and solutions
- Work with partners
- Worksheets
- Draw and Write to make connections
- Arts & Crafts
- Individual work
- Group work
- Questions and answers

Suggested Teacher Resources: textbook, worksheets, literature, Power Point presentations, problem of the day

Suggested Summative Assessment Activities:

- Teacher Observation of student participation/effort
- Student worksheet/projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: II. Operations and Algebraic Thinking
Grade Level: Kindergarten

Unit Summary:

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

Primary Interdisciplinary Connections: Language Arts, Science, Social Studies

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: K.OA – Operations and Algebraic Thinking

Standard #	Standard
K.OA.1	Represent addition and subtraction with objects fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions or equations
K.OA.2	Solve addition and subtraction word problems, and add and subtract with 10
K.OA.3	Decompose numbers less than or equal to 10 into pairs in more than one way and record each decomposition by drawing or equation
K.OA.4	For any number from 1 to 9 find the number that makes 10 when added to the given number and record the answer with a drawing or equation
K.OA.5	Fluently add and subtract within 5

Unit Essential Questions:

- How do you combine groups to determine how many altogether or a total?
- What is the symbol for joining groups (addition)?
- How do you separate parts from a whole to show the difference or how much more or less?
- What is the symbol for taking away, separating groups and comparing two quantities to find how much more/less (subtraction)?

Unit Enduring Understandings:

- Joining parts to make a whole is a way to interpret addition.
- Joining groups can be shown in an addition expression that uses the plus sign (+)
- Separating parts from a whole, taking part away and comparing two quantities to find how much more/less one quantity is than the other are interpretations of subtraction.
- Separating, taking away and comparison subtraction can be shown in a subtraction expression that uses the minus sign (-).

Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Add and subtract using a variety of different hands-on strategies
- Solve addition and subtraction word problems, and add and subtract within 10 by using objects or drawings to represent the problem.
- Decompose numbers less than or equal to 10 into pairs in more than one way (e.g. $5=2+3$ and $5=4+1$)
- Find the number that makes 10 when added to the given number by using objects or drawings and record the answer, using digits 1-9.
- Fluently add and subtract within 5.

Unit Vocabulary: addend, addition, difference, doubles, equal, sum, total, subtraction

Evidence of Learning

Suggested Formative Assessment Activities:

- Discussion
- Modeling
- Use of manipulatives
- Role-play, act out problems and solutions
- Work with partners
- Worksheets
- Draw and Write to make connections
- Arts & Crafts
- Individual work
- Group work
- Questions and answers

Suggested Teacher Resources: textbook, worksheets, literature, Power Point presentations, problem of the day

Suggested Summative Assessment Activities:

- Teacher Observation of student participation/effort
- Student worksheet/projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: III. Number and Operations in Base Ten
Grade Level: Kindergarten

Unit Summary:

- Work with numbers 11-19 to gain foundations for place value

Primary Interdisciplinary Connections: Language Arts, Science, Social Studies

21st Century Themes:
 Global Awareness Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: K.NBT – Number and Operations in Base Ten

Standard #	Standard
K.NBT.1	Work with numbers 11-19 to gain foundations for place value

<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How can the numbers of 10 and higher be broken down into tens and ones? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • The numbers of 10 and above are built on groups of tens and ones.
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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Compose and decompose numbers from 11-19 into ten ones and some additional ones by using objects or drawings, and record each composition by a drawing or equation.

Unit Vocabulary: tens, ones, digit

Evidence of Learning

Suggested Formative Assessment Activities:

- Discussion
- Modeling
- Use of manipulatives
- Role-play, act out problems and solutions
- Work with partners
- Worksheets
- Draw and Write to make connections
- Arts & Crafts
- Individual work
- Group work
- Questions and answers

Suggested Teacher Resources: textbook, worksheets, literature, Power Point presentations, problem of the day

Suggested Summative Assessment Activities:

- Teacher Observation of student participation/effort
- Student worksheet/projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: IV. Measurement and Data
Grade Level: Kindergarten

Unit Summary:

- Describe and compare measurable attributes
- Classify objects and count the number of objects in each category
- Tell time to the hour
- Use a calendar to identify measurable attributes
- Identify and know the value of a penny, nickel, dime and quarter
- Create and read picture and bar graphs

Primary Interdisciplinary Connections: Language Arts, Science, Social Studies

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 ___ Civic Literacy ___ Health Literacy

Learning Targets

Domain: K.MD – Measurement and Data

Standard #

Standard

K.MD.1	Describe and compare measurable attributes, such as length or weight and describe several measurable attributes of a single object.
K.MD.2	Directly compare two objects with a measurable attribute in common to see which object has “more of/less of” the attribute and describe the difference
K.MD.3	Classify objects and count the number of objects in each category
	Tell time to the hour
	Use a calendar to identify measurable attributes
	Identify and know the value of pennies, nickels, dimes and quarters
	Create and read picture and bar graphs

Unit Essential Questions:

- What are some attributes you might look at when you are sorting objects?
- How can you compare two objects with a measurable attribute in common?
- How can you classify objects and count the number of objects in that category?
- How do the hands of a clock show time to the hour?

Unit Enduring Understandings:

- Items can be sorted and compared by attributes such as color, shape, or size. Some attributes of objects are measurable and can be quantified using unit amounts. Object attributes can be used to sort the same set of objects in different ways.
- Objects can be compared with measurable attributes in common to see which objects have “more of” or “less of” the attribute and describe the difference.

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- How can you use a calendar to measure length of time?
- How can you use a calendar to compare days to today?
- What are the names and value of coins – up to one dollar?
- How can data be collected and represented to organize information and solve problems?

- Objects can be classified into given categories and counted in each category (Category counts less than or equal to 10)
- The hour hand tells the hour and the minute hand tells the number of minutes on an analog clock. The minute hand points to the number 12 when the time is given to the hour.
- Parts of the year can be described using months and seasons. All weeks have 7 days and each is the same length. The days in a month are numbered consecutively using the counting numbers.
- Days can be compared to today using yesterday and tomorrow.
- Specific coins have a unique value and name. The size of the coin does not indicate its value.
- Data can be collected and represented using different types of graphs. Graphs can be used to answer questions.

Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Describe measurable attributes of objects, such as length or weight, etc.
- Compare objects with common measurable attributes to see which object has “more of”/”less of” the attribute and describe the difference.
- Classify objects and count the number of objects in each category.
- Tell time to the hour on an analog clock.
- Describe parts of the year using months and seasons.
- Understand that all weeks have 7 days and each is the same length.
- Understand that the days in a month are numbered consecutively using the counting numbers.
- Understand that days can be compared to today using yesterday and tomorrow.
- Recognize and identify pennies, nickels, dimes and quarters.
- Understand the value of pennies, nickels, dimes and quarters.
- Create and read a graph to organize information and solve problems.

Unit Vocabulary: attribute, sort, classify, compare, today, tomorrow, yesterday, penny, nickel, dime, quarter

Evidence of Learning

Suggested Formative Assessment Activities:

- Discussion
- Modeling
- Use of manipulatives
- Role-play, act out problems and solutions
- Work with partners
- Worksheets
- Draw and Write to make connections
- Arts & Crafts
- Individual work
- Group work
- Questions and answers

Suggested Teacher Resources: textbook, worksheets, literature, Power Point presentations, problem of the day

Suggested Summative Assessment Activities:

- Teacher Observation of student participation/effort
- Student worksheet/projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: V. Geometry
Grade Level: Kindergarten

Unit Summary:

- Identify and describe shapes
- Analyze, compare, create and compose shapes
- Identify and create patterns

Primary Interdisciplinary Connections: Language Arts, Science, Social Studies

21st Century Themes:

Global Awareness Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: K.G – Geometry

Standard #	Standard
K.G.1	Describe objects in the environment using names of shapes and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind and next to.
K.G.2	Correctly name shapes regardless of their orientations or overall size
K.G.3	Identify shapes as two-dimensional or three dimensional
K.G.4	Analyze and compare two and three dimensional shapes in different sizes and orientations, using informal language to describe their similarities, differences, parts and other attributes
K.G.5	Model shapes in the world by building shapes from components
K.G.6	Compose simple shapes to form larger shapes
	Identify and create patterns

Unit Essential Questions:

- How can we describe and identify shapes in our world?
- How can we analyze, compare, and create these shapes?
- How can you identify a pattern?

Unit Enduring Understandings:

- Two and three dimensional objects with or without curved surfaces can be described and identified by their attributes.
- Shapes can be compared, created and analyzed by similar and dissimilar attributes.
- Relationships can be described and generalizations made for mathematical situations that have numbers or objects that repeat in predictable ways.

Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders and spheres).
- Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.
- Correctly name shapes regardless of their orientations or overall size.
- Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).
- Analyze and compare two and three dimensional shapes in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g. number of sides and vertices/”corners”) and other attributes (e.g. having sides of equal length).
- Model shapes in the world by building shapes from components (e.g. sticks and clay balls) and drawing shapes.
- Compose simple shapes to form larger shapes. (Can you join these two triangles with full sides touching to make a rectangle?).
- Identify, create and predict patterns of shapes, numbers and other items.

Unit Vocabulary: square, rectangle, circle, triangle, same size, same shape, matching parts, sphere, cube, cone, cylinder, corner, edge, side, roll, stack, slide, flat surface, repeat, pattern

Evidence of Learning

Suggested Formative Assessment Activities:

- Discussion
- Modeling
- Use of manipulatives
- Role-play, act out problems and solutions
- Work with partners
- Worksheets
- Draw and Write to make connections
- Arts & Crafts
- Individual work
- Group work
- Questions and answers

Suggested Teacher Resources: textbook, worksheets, literature, Power Point presentations, problem of the day

Suggested Summative Assessment Activities:

- Teacher Observation of student participation/effort
- Student worksheet/projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: I. Operations and Algebraic Thinking
Grade Level: Grade 1

Unit Summary:

- Represent and solve problems involving addition and subtraction.
- Understand and apply properties of operations and the relationship between addition and subtraction (commutative and associative properties).
- Begin mastery of addition and subtraction to 20.
- Work with addition and subtraction equations.

Primary Interdisciplinary Connections: Language Arts, Science, Social Studies, Technology

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 1.OA – Operations and Algebraic Thinking

Standard #	Standard
1.OA.1	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.
1.OA.2	Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20.
1.OA.3	Apply properties of operations as strategies to add and subtract.
1.OA.4	Understand subtraction as an unknown-addend problem.
1.OA.5	Relate counting to addition and subtraction.
1.OA.6	Add and subtract within 20, to demonstrate fluency for addition and subtraction within 10. Use strategies such as counting on, making 10, decomposing a number, using the relationship between addition and subtraction, and creating equivalent but easier or known sums.
1.OA.7	Understanding the meaning of the equal sign, and determine if equations involving addition and subtraction are true and false.
1.OA.8	Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.
---	Begin mastery of facts to 20.
---	Fact families
---	Adding triple addends.

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Unit Essential Questions:

- How can numbers to 20 be counted, read, represented, and written?
- How can the number of objects in patterned arrangements be recognized without counting?
- What are ways to think about addition?
- What are ways to think about subtraction?
- What strategies can be used as a bridge to fact mastery?
- How does the relationship between addition and subtraction create a fact family?
- How can the commutative property be used to understand addition?
- How can the associative property be used to add three addends?
- How can you solve a problem with a missing number?
- How can knowing multiple strategies to solve problems support students' ability to solve and understand word problems?
- Why is mastery and memorization of facts to 20 important?

Unit Enduring Understandings:

- Numbers can be represented in many ways.
- Counting tells how many are in a set and the number of objects in patterned arrangements can be recognized without counting.
- Numbers from 6-10 can be thought of as 5 and some more. Numbers from 11-20 can be thought of as 10 and some more.
- Meanings of addition; join by combining two groups; join by adding two groups, part-part whole and comparing.
- Addition strategies such as objects, pictures, number lines, doubles, making 10, touch math, and counting on can help students master facts.
- Meaning of subtraction; missing part, separating from a whole, and comparing quantities.
- Subtraction strategies such as objects, pictures, number lines, counting back, and touch math can help students master facts.
- A missing part of a whole can be found when the whole and the other part are known.
- Addition and subtraction have an inverse relationship. (fact family)
- Addends can be added in any order (associative property).
- Three numbers can be grouped and added in any order (commutative and associative properties).
- Solving word problems in an organized manner and an understanding of numerous strategies helps students systematically find the solution to a problem.

Mathematical Practices (1-8): 1, 2, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Develop a solid foundation of number sense.
- Expand their understanding of addition and subtraction.
- Solve addition and subtraction problems using a variety of strategies.
- Understand the relationship between addition and subtraction problems.
- Begin memorization of facts to 20.

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Unit Vocabulary:

number words 0-20	in all	part	whole	double
addition sentence	add	plus	sum	equals
join	order	addend	more than	less than
subtraction sentence	missing part	subtract	difference	equal sign
minus sign	compare	inverse relationship		fact family
commutative property	associative property			

Evidence of Learning

Suggested Formative Assessment Activities:

- Class Participation
- Oral / Choral Responses
- Open-Ended Questions
- Classwork
- Group Participation

Suggested Teacher Resources:

Textbook online resources manipulatives reading books flashcards

Suggested Summative Assessment Activities:

- Quizzes
- Tests

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Unit Overview

Content Area: Mathematics
Unit Number and Title: II. Number and Operations in Base Ten
Grade Level: Grade 1

Unit Summary:

- Extend the counting sequence.
- Understanding place value.
- Use place value understanding and properties of operations to add and subtract.

Primary Interdisciplinary Connections: Language Arts, Science, Social Studies, Technology

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 1.NBT – Numbers and Operations in Base Ten

Standard #	Standard
1.NBT.1	Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
---	Counting by 2, 5, and 10. (skip counting / patterns)
1.NBT.2	Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases.
1.NBT.2.a	10 can be thought of as a bundle of ten ones, called a ten.
1.NBT.2.b	The numbers from 11-19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
1.NBT.2.c	The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens.
1.NBT.3	Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons using the symbols $>$, $<$, and $=$.
1.NBT.4	Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
1.NBT.5	Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
---	Double and triple digit addition and subtraction with NO regrouping.

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<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How can skip counting help find the total number of items in a set? • How can patterns be used to show relationships? • How can two numbers be related to one another? • How can numbers be ordered? • How can numbers 10 and higher be shown, counted, read, and written? • What are ways numbers greater than 10 can be represented? • What are tens and ones? • How does knowing how adding and subtracting ones help you add and subtract 10? • How do traditional algorithms help in addition and subtraction double-digit problems? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Skip counting provides foundation for multiplication, division, and money skills. • The ability to find and use patterns is a characteristic of successful problem solving. • Two different numbers can be related using “less than” or “greater than” or “equal to”. • There is a specific order to a set of whole numbers. Position words such as before, after, and between can be used. • A set of 10 can be perceived as a single entity. • Numbers greater than 10 can be represented in a two-digit numeral and its expanded form. (sum of the tens and the ones) • Understanding two-digit numbers as tens and ones is fundamental for understanding of place value. • When adding and subtracting tens to a two digit number, only the tens digit changes. • Adding and subtracting a one-digit or a two-digit number from a two digit number always starts with the ones. 																									
<p>Mathematical Practices (1-8): 1, 2, 4, 5, 6, 7, 8</p>																										
<p>Unit Learning Targets:</p> <p>Students will:</p> <ul style="list-style-type: none"> • Be able to read, write, and represent numbers to 120. • Use skip-counting to recognize number patterns. • Recognize and understand place value as tens and ones. • Use the traditional algorithm of always starting with the ones when adding and subtracting multiple digit numbers. 																										
<p>Unit Vocabulary:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 20%;">Greater than</td> <td style="width: 20%;">less than</td> <td style="width: 20%;">equal to</td> <td style="width: 20%;">order</td> <td style="width: 20%;">relative size</td> </tr> <tr> <td>More</td> <td>fewer</td> <td>least</td> <td>greatest</td> <td>between</td> </tr> <tr> <td>Before</td> <td>after</td> <td>tens</td> <td>ones</td> <td>digit</td> </tr> <tr> <td>skip count</td> <td>patterns</td> <td>number line</td> <td>before</td> <td>after</td> </tr> <tr> <td>between</td> <td>place value</td> <td>ten frame</td> <td></td> <td></td> </tr> </table>		Greater than	less than	equal to	order	relative size	More	fewer	least	greatest	between	Before	after	tens	ones	digit	skip count	patterns	number line	before	after	between	place value	ten frame		
Greater than	less than	equal to	order	relative size																						
More	fewer	least	greatest	between																						
Before	after	tens	ones	digit																						
skip count	patterns	number line	before	after																						
between	place value	ten frame																								

Evidence of Learning

Suggested Formative Assessment Activities:

- Participation
- Oral / Choral Responses
- Open-Ended Questions
- Classwork
- Group Participation

Suggested Teacher Resources:

hundreds chart, number line, cubes

Suggested Summative Assessment Activities:

- Quizzes
- Tests

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Unit Overview

Content Area: Mathematics
Unit Number and Title: III. Measurement and Data
Grade Level: Grade 1

Unit Summary:

- Measure lengths indirectly and by standard units.
- Tell and write time.
- Represent and interpret data.
- Recognize, identify, and use calendars.
- Understand coin value up to twenty five cents.

Primary Interdisciplinary Connections: Language Arts, Science, Social Studies, Technology

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 1.MD – Measurement and Data

Standard #	Standard
1.MD.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object.
1.MD.2	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object end to end; understand that the length measurement of an object is the number of the same size length units that span it with no gaps or overlaps.
1.MD.3	Tell and write time in hours and half-hours using analog and digital clocks.
1.MD.4	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category and how many more or less are in one category than in another.
---	Coin value of a quarter, dime, nickel, and penny. Add dimes, nickels, pennies.
---	Use and find dates on a calendar.

Unit Essential Questions:

- How can objects be measured, compared, and ordered by length?
- How can clocks be read and used?
- How can calendars be read and used?
- What are the values of coins?
- What strategies can be used to count money?
- How can graphs be used and created to show data and answer questions?

Unit Enduring Understandings:

- Objects can be measured by comparisons and progressing through to use of physical units and then to standard units including inches, centimeters, and feet.
- Clocks are used to tell, describe, and measure time. Minutes and hours are units that can be used to measure time and elapsed time.

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	<ul style="list-style-type: none"> • A calendar is a table that tracks days, weeks, and months as units of time. • Specific coins each have a unique value. The size of a coin does not indicate its value. • Picture graphs and bar graphs can be used and created to interpret data and compare data.
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Mathematical Practices (1-8): 1, 2, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Be able to measure and compare length by using non-standard and standard units.
- Be able to tell time to the hour and half hour including elapsed time.
- Use a calendar as a tool to track days, weeks, and months in a year.
- Understand the value of coins.
- Add dimes, nickels, and pennies.
- Be able to use, interpret, compare, and create data using picture and bar graphs.

Unit Vocabulary:

Longest	shortest	estimate	measure	inch
foot/feet	centimeter	perimeter	hour	hour hand
minute	minute hand	O'clock, thirty	calendar	day
week	month	year	penny	nickel
dime	quarter	picture graph	bar graph	tally marks
data				

Evidence of Learning

Suggested Formative Assessment Activities:

- Participation
- Oral / Choral Responses
- Open-Ended Questions
- Classwork
- Group Participation

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Suggested Teacher Resources: cubes, ruler, paper clip, digital clock, analog clock, calendar

Suggested Summative Assessment Activities:

- Quizzes
- Tests

Unit Overview

Content Area: Mathematics
Unit Number and Title: IV. Geometry
Grade Level: Grade 1

Unit Summary:

- Reason with shapes and their attributes.
- Partition circles and rectangles into two and four equal shares, describing shares as halves, fourths, half of, fourth of, and quarter of. (fractions)
- Patterns can be described, reproduced, extended, and created.

Primary Interdisciplinary Connections: Language Arts, Science, Social Studies, Technology

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 1.G – Geometry

Standard #	Standard
1.G.1	Distinguish between defining attributes (e.g. triangles are closed and three sided) versus non-defining attributes (e.g., color, orientation, size); build and draw shapes to possess defining attributes.
1.G.2	Compose two dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three –dimensional shapes (cubes, right rectangular-prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.
1.G.3	Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters and use the phrases half of, fourth of, and quarter of. Describe the whole as two of or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.
---	Patterns can be identified and extended using words, symbols, and numbers.

Unit Essential Questions:

- How can you describe, sort, and classify two-dimensional/plane figures?
- How can you manipulate two-dimensional/plane figures to create new shapes?
- How can you describe, sort, and classify, three-dimensional/solid figures?
- How can you manipulate three-dimensional, solid shapes to create new shapes?
- How can you identify equal and unequal parts?
- How can you identify and make halves?

Unit Enduring Understandings:

- Two-dimensional/plane figures can be described, sorted, and classified by their defining and non-defining attributes.
- Two-dimensional/plane figures can be combined to make new shapes.
- Three-dimensional/solid figures can be described, sorted, and classified by their defining and non-defining attributes.
- Three-dimensional shapes can be combined to make new shapes.

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<ul style="list-style-type: none"> • How can you identify and make fourths? • How does finding and understanding patterns help you solve problems? 	<ul style="list-style-type: none"> • Students are able to identify equal and unequal parts using numerous strategies. • The ability to generalize from patterns contributes to problem solving ability. (AA, AB)
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Mathematical Practices (1-8): 1, 2, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Be able to identify, sort, classify, and reason with two-dimensional and three-dimensional shapes and their attributes.
- Understand that fractions can be used to name a part of a whole object or a part of a set of objects.
- Understand that some problems can be solved by identifying elements that repeat in a predictable way.

Unit Vocabulary:

Two-dimensional	plane shapes	rectangle	square	trapezoid
Triangle	circle	three-dimensional	solid figures	cube
rectangular prism	sphere	cone	cylinder	
non-defining attributes	defining attributes	face	corner	sides
equal	unequal	slide	flip	turn
whole	halves	quarters	half of	quarter of
patterns	repeat	predict		

Evidence of Learning

Suggested Formative Assessment Activities:

- Participation
- Oral / Choral Responses
- Open-Ended Questions
- Classwork
- Group Participation

Suggested Teacher Resources: pattern blocks, counters, fraction bars

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Suggested Summative Assessment Activities:

- Quizzes
- Tests

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[rev. 6/1/11]

Unit Overview

Content Area: Mathematics
Unit Number and Title: I. Operations and Algebraic Thinking
Grade Level: Grade 2

Unit Summary:

- Represent and solve problems involving addition and subtraction.
- Mastery of addition and subtraction within 20.
- Work with equal groups of objects to gain foundations for multiplication.

Primary Interdisciplinary Connections: Technology, Social Studies, Language Arts, Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 2.OA - Operations and Algebraic Thinking

Standard #	Standard
2.OA.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situation of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all position.
2.OA.2	Fluently add and subtract within 20 using mental strategies.
2.OA.3	Determine whether a group of objects (up to 20) has an odd or even number of members.
2.OA.4	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Unit Essential Questions:

- What two number sentences can you make from an array that has four columns and five rows?
- How can you show if a number is even or odd?
- In a particular word problem, what are the key words that indicate whether we need to subtract or add to solve?
- What addition strategy can we use to join $9+8$?
- What strategy can we used to subtract $10-4$?

Unit Enduring Understandings:

- There are several strategies that can be used when adding and subtracting numbers to assist in speed and memorization.
- Some numbers can be broken into two equal parts (even); other numbers cannot (odd).
- Number sentences can be used to add together or take apart whole numbers within 100.
- Word problems can be used to express addition and subtraction number sentences, sometimes requiring more than one operation to solve.
- The number of rows and columns of an array can be expressed as addends to create addition sentences.

Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Utilize mental strategies to increase speed and memorization with addition and subtraction within 20.
- Recognize the organization of an array.
- Write number sentences to express the total of a given array.
- Determine if a number is odd or even.
- Identify key words in word problems to determine the operation needed to solve.
- Solve multi-step word problems.

Unit Vocabulary:

add	addend	plus	sum	doubles	count on
make a ten	doubles plus one	fact families	array	subtract	minus
difference	count back	count up	doubles	minus one	
number line	odd	even	number sentence		

Evidence of Learning

Suggested Formative Assessment Activities:

- Group work
- Individual work
- Partner work
- Worksheets
- Drawings
- Make a model
- Discussion
- Questions and answers

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Suggested Teacher Resources:

Books Internet Displays Manipulatives Graph paper
Worksheets Teacher Manuals

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation/effort
- Oral responses
- Chapter and unit tests

Unit Overview

Content Area: Mathematics
Unit Number and Title: II. Number and Operations in Base Ten – part 1 of 2
Grade Level: Grade 2

- Unit Summary:**
- Understand place value
 - Comparing the value of numbers up to 3 digits
 - Skip-counting by 5, 10, and 100
 - Recognize several ways to express a number

Primary Interdisciplinary Connections: Technology, Science, Social Studies, Language Arts

21st Century Themes:
 Global Awareness Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 2.NBT – Number and Operations in Base Ten

Standard #	Standard
2.NBT.1	Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones.
2.NBT.2	Count within 1000; skip-count by 5s, 10s, 100s
2.NBT.3	Read and write numbers to 1000 using base ten numerals, number names, and expanded form.
2.NBT.4	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.

<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How can you group tens to show 80? • How many tens and ones are in 36? • What is the value of the 2 in 29? • What number can be written as $50 + 1$? • How can you show 123 in four different ways? • How do you show that 87 is less than 92? • How do you order numbers from ‘least to greatest’ and ‘greatest to least’? • What do you look for when describing a number pattern? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Children can model counting and grouping objects into tens using manipulatives. • Using manipulatives and work mats, the children can conceptualize place value and visualize how many tens and ones make up a number. • Numbers can be expressed in standard and expanded form. • To compare numbers, children need to consider the value of the tens and ones places of each number in a sequence. • Skip-counting in a table allows children to see a number pattern.
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Mathematical Practices (1-8): 1, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Demonstrate an understanding of place value through the use of manipulatives.
- Model a number in many ways using base ten blocks.
- Identify numbers in both standard and expanded form.
- Compare the value of a set of numbers by considering place value.
- Identify patterns and understand skip-counting by 5s, 10s, and 100s.

Unit Vocabulary:

ones	tens	hundreds	thousands	place value	digits
greater than	less than	equal	patterns	skip-count	

Evidence of Learning

Suggested Formative Assessment Activities:

- Group work
- Individual work
- Partner work
- Worksheets
- Drawings
- Make a model
- Discussion
- Questions and answers

Suggested Teacher Resources:

Books	Internet	Displays	Manipulatives	Graph paper
Worksheets	Teacher's Manuals			

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation/effort
- Oral responses
- Chapter and unit tests

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Unit Overview

Content Area: Mathematics

Unit Number and Title: III. Numbers and Operations in Base Ten – part 2 of 2

Grade Level: Grade 2

Unit Summary:

- Use place value understanding and properties of operations to add and subtract.
- By the end of second grade, students should have mastery of regrouping in addition and subtraction with three-digit numbers.

Primary Interdisciplinary Connections: Language Arts, Science, Social Studies, Technology

21st Century Themes:

Global Awareness Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 2.NBT – Numbers and Operations in Base Ten

Standard #	Standard
2.NBT.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/ or the relationship between addition and subtraction
2.NBT.6	Add up to four two-digit numbers using strategies based on place value and properties of operations.
2.NBT.7.a	Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.7.b	Relate the strategy of adding and subtracting within 1000 to a written method by understanding that it is necessary to compose or decompose tens and/or hundreds (regrouping).
2.NBT.8	Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given 100-900.
2.NBT.9	Explain why addition and subtraction strategies work, using place value and the properties of operations.

Unit Essential Questions:

- How can you solve a subtraction problem by using addition?
- How can you count on tens to add $43 + 20$?
- How do you know when you need to regroup?
- How can you regroup ones to make a ten to add $18 + 7$?
- How can you count back ten to find $65 - 30$?

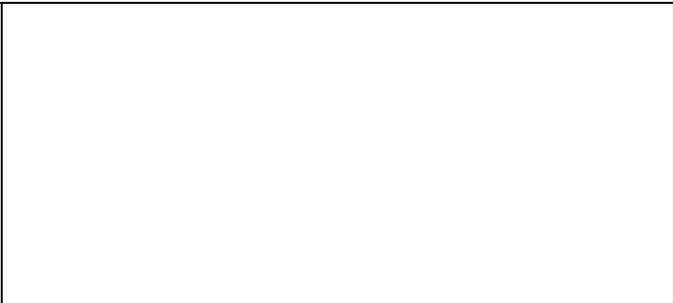
Unit Enduring Understandings:

- Addition and subtraction are opposite operations.
- Addition facts can be used to help solve subtraction problems.
- Base ten blocks can be used to model regrouping with addition and subtraction.
- Understanding place value can make it possible to add and subtract mentally.

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- Why do you break apart a ten to regroup in subtraction?
- How does making a model help you add and subtract within 1000?
- What model can you make to find 25-19?
- How can you use mental math to add 789 + 100? Subtract 789 – 100?



Mathematical Practices (1-8): 1, 2, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Use place value to compose and decompose numbers within 1000.
- Demonstrate how place value can be used to mentally add and subtract 10 or 100 to a number.
- Compare properties of addition and subtraction.
- Identify how addition can be used to solve subtraction problems.
- Demonstrate mastery of memorization of addition and subtraction facts within 20.

Unit Vocabulary:

regroup ones tens hundreds thousands base-ten blocks

Evidence of Learning

Suggested Formative Assessment Activities:

- Group work
- Individual work
- Partner work
- Worksheets
- Drawings
- Make a model
- Discussion
- Questions and answers

Suggested Teacher Resources:

Books Internet Displays Manipulatives Graph paper

Worksheets Teacher’s Manuals

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation/effort
- Oral responses
- Chapter and unit tests

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Unit Overview

Content Area: Mathematics
Unit Number and Title: IV. Measurement and Data – part 1 of 2
Grade Level: Grade 2

Unit Summary:

- Measure and estimate lengths in standard units.
- Relate addition and subtraction to length.
- Represent and interpret data.
- Measure the weight of objects up to a pound. Identify ounces and pounds as customary units of weight.
- Investigate customary units of measurement for capacity. Recognize a cup, pint, quart, and gallon.

Primary Interdisciplinary Connections: Language Arts, Social Studies, Science, and Technology

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 2.MD – Measurement and Data

Standard #	Standard
2.MD.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2.MD.2	Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
2.MD.3	Estimate lengths using units of inches, feet, centimeters, meters.
2.MD.4	Measure to determine how much longer one objects is than another, expressing the length difference in terms of a standard length unit.
2.MD.5	Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units.
2.MD.6	Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2,.... and represent whole-number sums and differences within 100 on a number line diagram.
2.MD.9.a	Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object.
2.MD.9.b	Show the measurement by making a line plot, where the horizontal scale is marked off in whole-number units.
2.MD.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take apart, and compare problems using information presented in a bar graph.

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Unit Essential Questions:

- How can you measure the length of an object with a paperclip (nonstandard unit)?
- How can you use an inch ruler to measure to the nearest inch? Nearest foot?
- How can you use a centimeter ruler to measure to the nearest centimeter?
- Which units would be most appropriate for measuring the length of a particular object?
- What is the difference in length of these two objects?
- Can you add and subtract lengths of similar units?
- How can you show addition and subtraction on a number line?
- How do you make a reasonable estimate of a measurement?
- What information do you need to show in a bar graph?
- How does the key on a pictograph help you read the data?
- What comparisons can be made based on the information from this graph?
- How do you read a line plot?
- What are all the ways we could measure a box?
- What are some objects in our room that weigh about a pound?
- How many cups are in a quart?

Unit Enduring Understandings:

- The length of an object can be used as a non-standard measurement unit for length.
- Measurement is a process of comparing a unit to the object being measured.
- Lengths of objects with similar units can be added and subtracted.
- A number line diagram can be used to help demonstrate addition and subtraction of numbers within 100.
- Different units can be used to estimate length.
- Information can be organized into various graphs and plots, each with their own attributes.
- Information presented on the graphs can be compared.
- Objects can be measured in length, weight, and capacity.
- Units of measure are specific to the attribute being measured.

Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7

Unit Learning Targets:

Students will:

- Demonstrate the steps of measuring an object's length.
- Understand the differences between various units of length.
- Understand the differences between various units of weight and capacity.
- Recognize that the units of measurement should be appropriate to the length of the object.
- Demonstrate addition and subtraction using a number line.
- Read, interpret, construct, and analyze displays of data.

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Unit Vocabulary:

inch	foot	centimeter	meter	ruler	units
yard	length	measure	bar graph	data	picture graph
pictograph	line plot	number line	ounces	pounds	cup
pint	quart	gallon	weight	capacity	

Evidence of Learning

Suggested Formative Assessment Activities:

- Group work
- Individual work
- Partner work
- Worksheets
- Drawings
- Make a model
- Discussion
- Questions and answers

Suggested Teacher Resources:

Books	Internet	Displays	Manipulatives	Graph paper
Worksheets	Teacher Manuals			

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation/effort
- Oral responses
- Chapter and unit tests

Unit Overview

Content Area: Mathematics
Unit Number and Title: V. Measurement and Data - part 2 of 2
Grade Level: Grade 2

Unit Summary:

- Work with time and money
- Work with a yearly calendar.

Primary Interdisciplinary Connections: Language Arts, Social Studies, Technology, and Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 ___ Civic Literacy ___ Health Literacy

Learning Targets

Domain: 2.MD – Measurement and Data

Standard #

Standard

2.MD.7 Tell and write time from analog and digital clocks to the nearest 5 minute, using A.M. and P.M.

2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.

Unit Essential Questions:

- How can you count by fives to tell time?
- How do you say 5:45 as time before the hour?
- Is the time 2 hours before noon expressed as 10:00 A.M. or 10:00 P.M.?
- How are days, weeks, months, and years related?
- What is the date following December 31st?
- What are the months in a year?
- How do you count a group of coins?
- How do you show the same amount in different ways?
- How can you compare money amounts?
- How do you add and subtract money amounts?
- How can you show how to make change for \$1.00?
- What is the date two weeks from Thursday?
- What are the day and date following December 31st?

Unit Enduring Understandings:

- Time can be expressed to the nearest five minutes.
- Time can be expressed using different units that are related to each other. A.M. and P.M. are used to designate specific time periods.
- Time can be expressed before or after the hour.
- A calendar shows days, weeks, and months.
- Specific coins or bills each have a unique value that is not indicated by physical size.
- When counting money, it is usually easier to start with the coin or bill with the greatest value.
- The same amount of money can often be represented using different combinations of coins and bills.
- The process for adding and subtracting money, written using cent notation, is the same as adding or subtracting whole numbers.

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	<ul style="list-style-type: none"> • Calendars organize the months, days, and dates within a year.
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Mathematical Practices (1-8): 1, 2, 4, 5, 6, 8

Unit Learning Targets:

Students will:

- Explore measurement of time in minutes and in hours
- Tell time to the quarter hour.
- Tell and show times to 5 minutes.
- Describe times of events as A.M. or P.M.
- Understand relationships of units of time.
- Solve word problems to navigate through a calendar.
- Order coins in a collection by value to find the total value.
- Model the same amount using different combinations of coins.
- Count on from the amount tendered to determine the change.
- Solve and record addition and subtraction word problems using two-digit coin amounts up to 99¢.
- Recognize the appropriate use of \$ and ¢ symbols.
- Analyze the organization of a calendar and answer questions about the order.

Unit Vocabulary:

minute hand	hour hand	half hour	half past	quarter past	quarter to
Second	minute	hour	A.M.	P.M.	week
months	years	analog	digital	o'clock	penny
nickel	dime	quarter dollar	cent	decimal point	

Evidence of Learning

Suggested Formative Assessment Activities:

- Role-play
- Group work
- Individual work
- Partner work
- Worksheets
- Drawings
- Make a model
- Discussion
- Questions and answers

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Suggested Teacher Resources:

Books

Internet

Worksheets

Teacher manuals

Posters

Manipulatives

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation/effort
- Oral responses
- Chapter and unit tests

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Unit Overview

Content Area: Mathematics
Unit Number and Title: VI. Geometry
Grade Level: Grade 2

Unit Summary:

- Reason with shapes and attributes

Primary Interdisciplinary Connections: Science, Technology, Social Studies, Language Arts

21st Century Themes:
 Global Awareness Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 2.G – Geometry

Standard #	Standard
2.G.1	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
2.G.2	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
2.G.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not to have the same shape.

Unit Essential Questions:

- What is the difference between a triangle and a hexagon?
- What is the difference between a cylinder and a cone?
- How can you make a hexagon out of smaller triangles?
- How would you use tiles to measure the area of a rectangle?
- How can we divide a rectangle into halves? Thirds? Fourths?
- What do the top and bottom numbers of a fraction tell?

Unit Enduring Understandings:

- Three-dimensional or solid figures have length, width, and height.
- Many solids can be described, classified, and analyzed by their faces or flat surfaces, edges, and vertices.
- Some shapes can be combined to make new shapes.
- Some shapes can be decomposed into other shapes.
- The amount of space inside a shape is its area and area can be measured using square units. Area can be found by counting square units.
- Shapes can be broken up into equal parts and classified as halves, thirds, and fourths.

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	<ul style="list-style-type: none"> • Fractional parts are equal shares or equal-sized portions of a whole.
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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Identify the characteristics of two- and three-dimensional figures.
- Classify shapes based on their characteristics.
- Demonstrate how smaller shapes can be used to compose larger shapes with different attributes.
- Demonstrate how larger shapes can be decomposed into smaller shapes with different attributes.
- Recognize that a rectangle can be partitioned into smaller square units to find its area.
- Explain how a whole can be divided into equal parts of varying size.
- Understand how a fraction represents parts of a whole.

Unit Vocabulary:

plane figure	triangle	square	rhombus	rectangle	trapezoid	circle
pentagon	hexagon	solid figures	sphere	cone	cube	cylinder
pyramid	rectangular prism		flat surface	curved surface		face
edge	area	square units	halves	half of	thirds	third of
fourths	fourth of	whole	equal shares			

Evidence of Learning

Suggested Formative Assessment Activities:

- Group work
- Individual work
- Partner work
- Worksheets
- Drawings
- Make a model
- Discussion
- Questions and answers

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Suggested Teacher Resources:

Books Internet Worksheets Teacher manuals Manipulatives Posters

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation/effort
- Oral responses
- Chapter and unit tests

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Unit Overview

Content Area: Mathematics
Unit Number and Title: I. Operations and Algebraic Thinking
Grade Level: Grade 3

Unit Summary:

- Represent and solve problems involving multiplication and division.
- Understand properties of multiplication and the relationship between multiplication and division.
- Multiply and divide within 144 thru 12, and master
- Solve problems involving the four operations, and identify and explain patterns in arithmetic.

Primary Interdisciplinary Connections: Language Arts, Technology, Social Studies, and Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 ___ Civic Literacy ___ Health Literacy

Learning Targets

Domain: 3.OA – Operations and Algebraic Thinking

Standard #	Standard
3.OA.1	Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each.
3.OA.2	Interpret whole-number quotients of whole numbers, interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.
3.OA.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
3.OA.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = ? \div 3$, $6 \times 6 = ?$.
3.OA.5	Apply properties of operations as strategies to multiply and divide. Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.); $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.). Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$ (Distributive property.)
3.OA.6	Understand division as an unknown – factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.
3.OA.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

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3.OA.8	Solve two- step word problems using the four operations. Represent these problems using the four operations. 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.
3.OA.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.
<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How is addition related to multiplication? • How can arrays show multiplication and the Commutative Property of Multiplication? • How is multiplying by 4 like/different from multiplying by 2? • How can drawing a picture help you solve problems? • How is multiplying by 6 like/different from multiplying by 3? • How can you find the rule shown on a function table? • How can you use arrays or multiplication tables to find missing factors? • How can models help you understand division? • How is division related to subtraction? • How can you use multiplication arrays to find quotients? • How can you use arrays to find fact families? • How do you estimate to find products? • In what ways can you model 2-digit division? • What does the remainder represent in a division problem? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Multiplication is a way of representing repeated addition. When equal groups are being added multiple times, the multiplication symbol can be used to represent the addition in a more concise way. • In a multiplication expression with two factors, the first factor is the number of groups, or number of rows in an array. The second factor is the number in each group, or the number of columns in the array. • Multiplying a number by 4 is the same as multiplying a number by 2 (or doubling a number), twice. The product is always even. • Multiplication can be written in both vertical and horizontal form. • Multiplying a number by 6 is the same as multiplying the number by 3, and then doubling the product. • The product of an 8s fact can be found by doubling the corresponding 4s fact. • Multiplication can be used to find the total number of objects only when the number of objects in each group is equal. Addition can be used whether the number in each group is equal or unequal. • To multiply by 12, students can break apart the factor 12 into 10 and 2 and use the corresponding 10s and 2s facts. The product is equal to the sum of those two facts. • A function table has pairs of numbers related by a function or rule.

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	<ul style="list-style-type: none"> • Division can help you find how many items are in each group and how many groups there are. • Repeated subtraction can be used to solve a division problem. • Division can be defined as separating into equal groups. • Multiplication and division are inverse, or opposite operations. • Division is used to separate a group of objects into equal groups. 		
Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8			
Unit Learning Targets:			
Students will:			
<ul style="list-style-type: none"> • Represent and solve problems involving multiplication and division • Understand properties of multiplication and the relationship between multiplication and division • Multiply and Divide within 144; master and memorize facts to 12 • Solve problems involving the four operations, and identify and explain patterns in arithmetic 			
Unit Vocabulary:			
Commutative Property of Multiplication	Multiplication	Multiply	Multiple
Associative Property of Multiplication	Array	Product	Factor
Identity Property of Multiplication	Divide	Dividend	Divisor
Zero Property of Multiplication	Remainder	Quotient	Fact Family
Equation	Expression		

Evidence of Learning

Suggested Formative Assessment Activities:

- Math Centers
- Weekly Facts Quizzes
- Group Work
- Role-plays
- Arts and Crafts
- Discussion
- Questions and answers
- Individual work
- Partner work
- Mixed Review and Test Prep

Suggested Teacher Resources:

Internet Worksheets Teacher Manuals Instructional Videos

Suggested Summative Assessment Activities:

- Chapter and Unit Review/Test
- End-of-Year Test
- Oral responses

Unit Overview

Content Area: Mathematics
Unit Number and Title: II. Number and Operations in Base Ten
Grade Level: Grade 3

Unit Summary:

- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Primary Interdisciplinary Connections: Language Arts, Technology, Social Studies and Science

21st Century Themes:

Global Awareness Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 3.NBT – Number and Operation in Base Ten

Standard #

Standard

3.NBT.1	Use place value understanding to round whole numbers to the nearest 10 or 100.
3.NBT.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and /or the relationship between addition and subtraction.
3.NBT.3	Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.

Unit Essential Questions:

- What patterns can you find on a hundred chart?
- How can you find the value of a digit by using its place-value position?
- How does multiplying using place value differ from multiplying using regrouping?
- How do you use base-ten blocks to model 3-digit addition?
- How is the subtraction algorithm extended for larger numbers?
- How is regrouping when subtracting 3- and 4- digit numbers like regrouping when subtracting 2-digit numbers? How are they different?

Unit Enduring Understandings:

- Place value helps us to know, read, and write numbers.
- Rounding is a way to estimate when you want to know approximately how much or approximately how many.
- 2- and 3-digit numbers can be rounded to the nearest ten or to the nearest hundred.
- Multiplication can be recorded with regrouping or partial products. When using partial products, sometimes regrouping is necessary during the addition step.
- When adding 3-digit numbers, they may need to regroup once, twice or not at all.
- To add 4-digit numbers, follow the same steps as for adding 3-digit numbers, then continue to the thousands place.
- When subtracting 3- and 4-digit numbers, you might need to regroup one, two or three times.

Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- find sums of two- , three- , and four-digit addends
- add three-digit numbers by regrouping to hundreds
- use a number line to find an estimate
- subtract three-digit numbers by regrouping ones, tens, and hundreds
- multiply tens and ones by making arrays
- use base-ten blocks to help multiply
- round numbers to the nearest ten or to the nearest hundred

Unit Vocabulary:

Multiple	Rounding	Estimate	Regrouping	Difference
Product	Array	Factor		
Commutative Property of Addition		Associative Property of Addition		
Identity Property of Addition				

Evidence of Learning

Suggested Formative Assessment Activities:

- Group Work
- Math Centers
- Discussion
- Questions and answers
- Individual work
- Partner work
- Mixed Review and Test Prep

Suggested Teacher Resources:

Internet Worksheets Teacher Manuals Instructional Videos

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Suggested Summative Assessment Activities:

- Chapter and Unit Review/Test
- End-of-Year Test
- Oral responses

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Unit Overview

Content Area: Mathematics
Unit Number and Title: III. Number and Operations – Fractions
Grade Level: Grade 3

Unit Summary:

- Develop an understanding of fractions as numbers

Primary Interdisciplinary Connections: Language Arts, Technology, Social Studies, and Science

21st Century Themes:
 Global Awareness Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 3.NF – Number and Operations - Fractions

Standard #	Standard
3.NF.1	Understanding a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.
3.NF.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram.
3.NF.2a	Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.
3.NF.2b	Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.
3.NF.3	Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
3.NF.3a	Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line
3.NF.3b	Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$). Explain why the fractions are equivalent, e.g., by using a visual fraction model.
3.NF.3c	Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. <i>Examples: Express 3 in the form $3 = 3/1$; recognize that $6/1 = 6$; locate $4/4$ and 1 at the same point of a number line diagram.</i>
3.NF.3d	Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

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Unit Essential Questions:

- How can you show a fraction as a part of a whole?
- How can you show a fraction as part of a group?
- How can you use fraction bars to compare fractions?
- When a fraction can be simplified, will its simplified form have a greater or lesser denominator?

Unit Enduring Understandings:

- A fraction names a part of a whole or group.
- The numerator of a fraction names the number of parts in the group being counted. The denominator names the total number of parts in the group.
- If two fractions have the same denominator, then the fraction with the greater numerator is the greater fraction.
- When a fraction can be simplified, its simplified form will have a lesser denominator.

Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- show a whole divided into equal parts
- show, read and write fractions
- explore fractions that make a whole
- investigate equivalent fractions
- model and describe equal parts of group
- read and write fractions that describe parts of group
- count and name all the parts of a group
- compare parts of groups
- write the fraction that names the point of each letter on a number line

Unit Vocabulary:

Fraction Numerator Denominator Equivalent Fractions Simplest Form

Evidence of Learning

Suggested Formative Assessment Activities:

- Math Centers
- Group Work
- Role-plays
- Arts and Crafts
- Discussion
- Questions and answers
- Individual work
- Partner work
- Mixed Review and Test Prep

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Suggested Teacher Resources:

Internet

Worksheets

Teacher Manuals

Instructional Videos

Suggested Summative Assessment Activities:

- Chapter and Unit Review/Test
- End-of –Year Test
- Oral responses

Unit Overview

Content Area: Mathematics
Unit Number and Title: IV. Measurement and Data
Grade Level: Grade 3

Unit Summary:

- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
- Represent and interpret data.
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
- Geometric measurement: recognize perimeter as an attribute of a plane figure and distinguish between linear and area measures.

Primary Interdisciplinary Connections: Language Arts, Technology, Social Studies, and Science

21st Century Themes:

Global Awareness Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 3.MD – Measurement and Data

Standard #	Standard
3.MD.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
3.MD.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). ¹ Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
3.MD.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. <i>For example, draw a bar graph in which each square in the bar graph might represent 5 pets.</i>
3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.
3.MD.5	Recognize area as an attribute of plane figures and understand concepts of area measurement
3. MD.5a	A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.
3.MD.5b	A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.

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3. MD.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).		
3.MD.7	Relate area to the operations of multiplication and addition.		
3.MD.7a	Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.		
3.MD.7b	Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.		
3.MD.7c	Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.		
3.MD.7d	Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.		
3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How is finding elapsed time different from subtraction? • How can we decide which metric units to use to find the mass, or amount of matter in an object? • How can you decide which metric units to use when measuring liquids? • How are horizontal and vertical bar graphs alike and different? • What information can be found on a bar graph? • When would you use each customary unit of length? • What is perimeter? • How can you use unit cubes to find the perimeter of your desk? • How can you find the perimeter of an object? • What happens to the area of a rectangle when you change its perimeter? • How is counting the cubes related to multiplying to find volume? • How does a model for volume help you solve problems? </td> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • The amount of time between the beginning and end of an activity is called elapsed time. • The most common metric units for measuring mass are gram and kilogram. • Capacity is the amount a container will hold when it is filled. Capacity can be measured by using metric units such as milliliter, and liter. • Bar graphs use bars to represent data. A bar graph has a scale of numbers that helps you read the number represented by each bar. • Sometimes you need to measure to the nearest half inch. • The distance around a plane figure is its perimeter. Perimeter can be measured in nonstandard units or standard units. • The area of a rectangle can be found by multiplying the number of rows by the number of square units in each row. • Volume is the amount of space a solid figure takes up. It is measured in cubic units. </td> </tr> </table>		<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How is finding elapsed time different from subtraction? • How can we decide which metric units to use to find the mass, or amount of matter in an object? • How can you decide which metric units to use when measuring liquids? • How are horizontal and vertical bar graphs alike and different? • What information can be found on a bar graph? • When would you use each customary unit of length? • What is perimeter? • How can you use unit cubes to find the perimeter of your desk? • How can you find the perimeter of an object? • What happens to the area of a rectangle when you change its perimeter? • How is counting the cubes related to multiplying to find volume? • How does a model for volume help you solve problems? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • The amount of time between the beginning and end of an activity is called elapsed time. • The most common metric units for measuring mass are gram and kilogram. • Capacity is the amount a container will hold when it is filled. Capacity can be measured by using metric units such as milliliter, and liter. • Bar graphs use bars to represent data. A bar graph has a scale of numbers that helps you read the number represented by each bar. • Sometimes you need to measure to the nearest half inch. • The distance around a plane figure is its perimeter. Perimeter can be measured in nonstandard units or standard units. • The area of a rectangle can be found by multiplying the number of rows by the number of square units in each row. • Volume is the amount of space a solid figure takes up. It is measured in cubic units.
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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- investigate telling time to the minute
- tell time as minutes after the hour
- use a clock to measure elapsed time
- solve word problems involving addition and subtraction of time intervals in minutes
- use metric units to estimate and measure mass
- use metric units to estimate and measure capacity
- read bar graphs that look different but represent the same data
- use customary units to measure length
- estimate length and check the estimate by measuring to the nearest inch
- measure length to the nearest half inch
- find the perimeter of an object or plane figure
- measure to find perimeter
- learn how perimeter and area are related
- measure and compare the volumes of three-dimensional objects using materials such as cubes

Unit Vocabulary:

Length	Foot	Yard	Mile	Inch	Volume	Liter
Kilometer	Gram	Area	Perimeter	Square Unit	Data	Hour Hand
Minute Hand	Second	Bar Graph	Horizontal	Vertical		

Evidence of Learning

Suggested Formative Assessment Activities:

- Math Centers
- Group Work
- Role-plays
- Arts and Crafts
- Discussion
- Questions and answers
- Individual work
- Partner work
- Mixed Review and Test Prep

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Suggested Teacher Resources:

Internet Worksheets Teacher Manuals Instructional Videos

Suggested Summative Assessment Activities:

- Chapter and Unit Review/Test
- End-of-Year Test
- Oral response

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Unit Overview

Content Area: Mathematics
Unit Number and Title: V. Geometry
Grade Level: Grade 3

Unit Summary:

- Reason with shapes and their attributes

Primary Interdisciplinary Connections: Language Arts, Technology, Social Studies, and Science

21st Century Themes:

Global Awareness Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 3.G – Geometry

Standard #

Standard

3.G.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
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3.G.2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. <i>For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.</i>
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Unit Essential Questions:

- How are plane figures classified?
- How are various quadrilaterals different?
- How can you tell if two polygons are similar?
- In what ways can you classify triangles?
- How can you tell if two polygons are congruent?
- How can you tell if a figure is symmetrical?

Unit Enduring Understandings:

- A polygon is a closed plane figure made of line segments. It is two-dimensional, meaning it can be measured in terms of length and width.
- Quadrilaterals are polygons with 4 sides and 4 angles; different types of quadrilaterals are given different names.
- Similar figures have the same shape, but can be different sizes.
- Triangles can be classified by the lengths of their sides and the measures of their angles.
- Polygons that have the same shape and the same size are congruent.
- Some polygons have more than one line of symmetry; others have none.

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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- understand the differences among various quadrilaterals
- identify and draw similar figures
- identify, describe, and classify triangles
- identify 2-dimensional congruent figures
- identify and draw lines of symmetry in plane figures

Unit Vocabulary:

Quadrilateral	Pentagon	Hexagon	Octagon	Polygon
Rectangle	Square	Trapezoid	Parallelogram	Triangle
Symmetry	Rhombus	Congruence	Similarity	

Evidence of Learning

Suggested Formative Assessment Activities:

- Math Centers
- Group Work
- Role-plays
- Arts and Crafts
- Discussion
- Questions and answers
- Individual work
- Partner work
- Mixed Review and Test Prep

Suggested Teacher Resources:

Internet Worksheets Teacher Manuals Instructional Videos

Suggested Summative Assessment Activities:

- Chapter and Unit Review/Test
- End-of –Year Test
- Oral responses

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MATHEMATICS CURRICULUM

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Unit Overview

Content Area: Mathematics
Unit Number and Title: I. Operations and Algebraic Thinking
Grade Level: Grade 4

Unit Summary:

- Use the four operations with whole numbers to solve problems
- Gain familiarity with factors and multiples
- Generate and analyze patterns

Primary Interdisciplinary Connections: Language Arts, Technology, Social Studies, & Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 4.OA Operations and Algebraic Thinking

Standard #	Standard
4.OA.1	Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations.
4.OA.2	Multiply or divide to solve word problems involving multiplicative comparison.
4.OA.3.a	Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted.
4.OA.3.b	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.4	Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
4.OA.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.

Unit Essential Questions:

- How can multiplication be used to join equal-size groups?
- How can division be used to separate into equal-size groups?
- What is the relationship between factors, products, and quotients?
- How do you determine the correct operations needed to solve a problem?

Unit Enduring Understandings:

- Students will use and understand the inverse relationships between addition and subtraction and between multiplication and division.
- Students will construct, use and explain procedures for performing whole number calculations.

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<ul style="list-style-type: none"> • When could you apply the multiplication properties? • What conclusions can you draw about a remainder? • What is the relationship between factors, multiples, and multiplication? • How can patterns help determine a rule? • How can you find the Least Common Multiple of 2 numbers? • How are prime numbers and composite numbers alike and different? 	<ul style="list-style-type: none"> • Students will recognize, describe, extend, and create patterns. • Students will determine the Least Common Multiple (LCM) of two numbers. • Students will use divisibility rules to identify prime factors. 																
<p>Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8</p>																	
<p>Unit Learning Targets:</p> <p>Students will:</p> <ul style="list-style-type: none"> • Relate repeated addition to multiplication and repeated subtraction to division • Use the inverse relationship between multiplication and division to solve problems • Solve problems by using the correct operation • Identify and use the properties of multiplication • Interpret remainders by solving word problems • Determine whether a number up to 144 is prime or composite • Find the Least Common Multiple (LCM) of 2 numbers • Find a rule for a number relationship and write an equation for that rule 																	
<p>Unit Vocabulary:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 25%;">fact family</td> <td style="width: 25%;">inverse operations</td> <td style="width: 25%;">factor</td> <td style="width: 25%;">product</td> </tr> <tr> <td>addend</td> <td>sum</td> <td>difference</td> <td>dividend</td> </tr> <tr> <td>divisor</td> <td>quotient</td> <td>remainder</td> <td>divisible</td> </tr> <tr> <td>prime number</td> <td>composite number</td> <td colspan="2">Least Common Multiple (LCM)</td> </tr> </table>		fact family	inverse operations	factor	product	addend	sum	difference	dividend	divisor	quotient	remainder	divisible	prime number	composite number	Least Common Multiple (LCM)	
fact family	inverse operations	factor	product														
addend	sum	difference	dividend														
divisor	quotient	remainder	divisible														
prime number	composite number	Least Common Multiple (LCM)															

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Oral questions & answers
- Partner Work
- Group work
- Individual work
- Worksheets
- Drawings
- Discussion

Suggested Teacher Resources:

Test/Resource Book	Manipulatives	Internet	Worksheets
Teacher manuals	Displays	Books	DVDs

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation/effort
- Tests
- Oral responses

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Unit Overview

Content Area: Mathematics
Unit Number and Title: II. Number and Operations in Base Ten
Grade Level: Grade 4

Unit Summary:

- Generalize place understanding for multi-digit whole numbers
- Use place value understanding and properties of operations to perform multi-digit arithmetic

Primary Interdisciplinary Connections: Language Arts, Science, Social Studies, Technology

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 4.NBT – Number and Operations in Base Ten

Standard #	Standard
4.NBT.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.
4.NBT.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.3	Use place value understanding to round multi-digit whole numbers to any place.
4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.
4.NBT.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.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.

Unit Essential Questions:

- How can you use place value to read, write, compare, and order numbers?
- How do you use your understanding of place value to solve problems that involve adding and subtracting multi-digit numbers?
- How can your knowledge of place value help you round numbers through millions?

Unit Enduring Understandings:

- Students use real-life experiences, physical materials, and technology to construct meanings for numbers.
- Students demonstrate an understanding of place value concepts.
- Students compare and order numbers.
- Students will construct, use and explain procedures for performing whole number calculations.

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<ul style="list-style-type: none"> • How can you multiply 3-digit and 4-digit numbers by 1-digit numbers? • How can you use your understanding of multiplication to multiply two 2-digit numbers? • How can the division algorithm be extended? 			
Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8			
Unit Learning Targets:			
<p>Students will:</p> <ul style="list-style-type: none"> • Model, read, write, and identify the place value through millions • Compare numbers through millions using place value • Round whole numbers through millions • Add and subtract multi-digit numbers • Multiply 3-digit and 4-digit numbers by 1-digit numbers • Multiply a 2-digit number by a 2-digit number • Divide a 4-digit number by a 1-digit number with and without remainders 			
Unit Vocabulary:			
period	standard form	expanded form	word form
millions	estimate	round	dividend
divisor	quotient	factor	product

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Oral questions & answers
- Partner Work
- Group work
- Individual work
- Worksheets
- Drawings
- Discussion

Suggested Teacher Resources:

Test/Resource Book	Manipulatives	Internet	Worksheets
Teacher manuals	Displays	Books	DVDs

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation/effort
- Tests
- Oral responses

Unit Overview

Content Area: Mathematics

Unit Number and Title: III. Number and Operations – Fractions – Part 1 of 2

Grade Level: Grade 4

Unit Summary:

- Extend understanding of fraction equivalence and ordering
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers

Primary Interdisciplinary Connections: Language Arts, Technology, Social Studies, Science, Art

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 4.NF – Number and Operations - Fractions

Standard #	Standard
4.NF.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.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.3.a	Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
4.NF.3.b	Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. <i>Examples:</i> $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.
4.NF.3.c	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.3.d	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.

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<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How are numbers that represent fractional parts modeled, compared, and ordered? • How can you compare fractions by using the numerators with common denominators? • How can the same fractional amount be represented by an infinite set of different equivalent fractions? • How can benchmark fractions be used to compare fractional amounts? • How can your understanding of fractions and mixed numbers help you add or subtract? • Why does the denominator stay the same when you add fractions, while the numerator changes? • How can you use models to add and subtract mixed numbers? • How can finding the Least Common Denominator (LCD) allow you to compare and order fractions? • How can you find the Greatest Common Factor (GCF) to simplify fractions? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Students use concrete models to explore and understand addition and subtraction of fractions. • Students create common denominators and numerators to compare fractions. • Students use concrete models and the principle of $a/b = (n \times a)/(n \times b)$ to generate equivalent fractions. • Students compare fractions using benchmark numbers. • Students will add and subtract fractions and mixed numbers. • Students will find Least Common Denominator (LCD) to compare and order fractions. • Students will find Greatest Common Factor (GCF) to simplify fractions. 												
<p>Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8</p>													
<p>Unit Learning Targets:</p> <p>Students will:</p> <ul style="list-style-type: none"> • Use models and objects to show equivalent fractions • Use fractional models to compare and order fractions • Create common denominators and numerators to compare fractions • Compare fractions using a benchmark number such as $\frac{1}{2}$ • Use models to add like fractions • Read and write mixed numbers • Add and subtract mixed numbers • Determine Least Common Denominator (LCD) • Determine Greatest Common Factor (GCF) 													
<p>Unit Vocabulary:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 25%;">fraction</td> <td style="width: 25%;">numerator</td> <td style="width: 25%;">simplest form</td> <td style="width: 25%;">Least Common Denominator (LCM)</td> </tr> <tr> <td>denominator</td> <td>equivalent fractions</td> <td>mixed number</td> <td>Greatest Common Factor (GCF)</td> </tr> <tr> <td>like fractions</td> <td>unlike fractions</td> <td></td> <td></td> </tr> </table>		fraction	numerator	simplest form	Least Common Denominator (LCM)	denominator	equivalent fractions	mixed number	Greatest Common Factor (GCF)	like fractions	unlike fractions		
fraction	numerator	simplest form	Least Common Denominator (LCM)										
denominator	equivalent fractions	mixed number	Greatest Common Factor (GCF)										
like fractions	unlike fractions												

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Oral questions & answers
- Partner Work
- Group work
- Individual work
- Worksheets
- Drawings
- Discussion

Suggested Teacher Resources:

Test/Resource Book	Manipulatives	Internet	Worksheets
Teacher manuals	Displays	Books	DVDs

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation/effort
- Tests
- Oral responses

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Unit Overview

Content Area: Mathematics

Unit Number and Title: IV. Number and Operations – Fractions Part 2 of 2

Grade Level: Grade 4

Unit Summary:

- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers
- Understand decimal notation for fractions, and compare decimal fractions

Primary Interdisciplinary Connections: Language Arts, Technology, Social Studies, Science, Art

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 4.NF – Number and Operations - Fractions

Standard #	Standard
4.NF.4.a	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. Understand a fraction a/b as a multiple of $1/b$.
4.NF.4.b	Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number.
4.NF.4.c	Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. <i>For example, if each person at a party will eat $3/8$ 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?</i>
4.NF.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
4.NF.6	Use decimal notation for fractions with denominators 10 or 100. <i>For example, rewrite 0.62 as $62/100$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</i>
4.NF.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.

Unit Essential Questions:

- How can multiplying a fraction by a whole number be used to understand fractions?
- How can multiplying a fraction by a whole number represent different products of the same fraction? (e.g. $1/2 = 3/6$)

Unit Enduring Understandings:

- Students will understand a/b as a multiple of $1/b$. *For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.*

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<ul style="list-style-type: none"> • How can multiplying a fraction by a whole number be used to solve word problems? • How do the models that represent one whole, one tenth, and one hundredth relate to each other? • What is the value of each digit in a decimal to the hundredths place? • How can a tenths decimal be equivalent to a hundredths decimal? • How are comparing and ordering decimals related? • How can renaming decimals as fractions within powers of ten be used to understand decimals? 	<ul style="list-style-type: none"> • Students will recognize equivalent products of fractions. <i>For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$).</i> • Students will model, read, and write fractions as decimals. • Students will use concrete and pictorial models to understand decimal place value to hundredths place. • Students model, read, and write decimals to the hundredths place. • Students use place value and pictorial models to compare and order decimals. • Students rename decimals as fractions within powers of ten. <i>For example, express $3/10$ as $30/100$, and add $3/10 + 4/100 = 30/100 + 4/100 = 34/100$.</i>
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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Multiply fractions by whole numbers
- Solve word problems, multiplying a fraction by a whole number
- Model, read, and write fractions as decimals
- Use models and place-value charts to represent decimals to hundredths
- Find equivalent decimals
- Model, read, and write mixed numbers as decimals
- Compare and order decimals

Unit Vocabulary:

fraction	numerator	denominator	equivalent fractions
simplest form	mixed number	like fractions	unlike fractions
decimal	decimal point	tenth	hundredth
equivalent decimals			

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Oral questions & answers
- Partner work
- Group work
- Individual work
- Worksheets
- Drawings
- Discussion

Suggested Teacher Resources:

Test/Resource Book	Manipulatives	Internet	Worksheets
Teacher manuals	Displays	Books	DVDs

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation/effort
- Tests
- Oral responses

Unit Overview

Content Area: Mathematics

Unit Number and Title: V. Measurement and Data – Part 1 of 2

Grade Level: Grade 4

Unit Summary:

- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- Represent and interpret data.

Primary Interdisciplinary Connections: Language Arts, Social Studies, Science & Technology

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 4.MD Measurement and Data

Standard #	Standard
4.MD.1	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. <i>For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...</i>
4.MD.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.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems. <i>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.</i>
4.MD.4	Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

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<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How do you convert among customary units? • How do you convert among metric units? • How do you determine the perimeter of a polygon? • How do you determine the area of a polygon? • How can you use a formula to determine the area of a rectangle? • How can you use the formula for area of a rectangle to find a missing length when given the area and width? • How do you use line plots to solve problems? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Length can be measured in different systems and using different units in each system as related to each other • Students use an understanding of metric prefixes to convert measurements within the metric system. • Students use understanding of the customary system to convert units within the customary system. • Students use the formula ‘area = length × width’ to determine the area of a rectangle. • Students make and read line plots to represent data. 																														
<p>Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8</p>																															
<p>Unit Learning Targets:</p> <p>Students will:</p> <ul style="list-style-type: none"> • Convert metric units of length, weight, capacity, time, and temperature • Convert customary units of length, weight and capacity • Record measurement equivalents in a two column table • Determine areas of polygons • Determine perimeters of polygons • Use line plots to represent data 																															
<p>Unit Vocabulary:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 20%;">capacity</td> <td style="width: 20%;">cup</td> <td style="width: 20%;">fluid ounce</td> <td style="width: 20%;">foot</td> <td style="width: 20%;">mile</td> </tr> <tr> <td>gallon</td> <td>ounce</td> <td>pound</td> <td>ton</td> <td>weight</td> </tr> <tr> <td>mass</td> <td>metric system</td> <td>customary</td> <td>liters</td> <td>meters</td> </tr> <tr> <td>milli-</td> <td>centi-</td> <td>deci-</td> <td>kilo-</td> <td>quart</td> </tr> <tr> <td>pint</td> <td>hour</td> <td>minute</td> <td>elapsed time</td> <td>perimeter</td> </tr> <tr> <td>area</td> <td>square unit</td> <td>line plot</td> <td>Fahrenheit</td> <td>Celsius</td> </tr> </table>		capacity	cup	fluid ounce	foot	mile	gallon	ounce	pound	ton	weight	mass	metric system	customary	liters	meters	milli-	centi-	deci-	kilo-	quart	pint	hour	minute	elapsed time	perimeter	area	square unit	line plot	Fahrenheit	Celsius
capacity	cup	fluid ounce	foot	mile																											
gallon	ounce	pound	ton	weight																											
mass	metric system	customary	liters	meters																											
milli-	centi-	deci-	kilo-	quart																											
pint	hour	minute	elapsed time	perimeter																											
area	square unit	line plot	Fahrenheit	Celsius																											

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Oral questions & answers
- Partner work
- Group work
- Individual work
- Worksheets
- Drawings
- Discussion

Suggested Teacher Resources:

Test/Resource Book	Manipulatives	Internet	Worksheets
Teacher manuals	Displays	Books	DVDs

Suggested Summative Assessment Activities:

- Teacher observation
- Students participation/effort
- Tests
- Oral responses

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Unit Overview

Content Area: Mathematics

Unit Number and Title: VI. Measurement and Data – Part 2 of 2

Grade Level: Grade 4

Unit Summary:

- Represent and interpret data.
- Geometric measurement: understand concepts of angle and measure angles.

Primary Interdisciplinary Connections: Language Arts, Social Studies, Science & Technology

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 4.MD Measurement and Data

Standard #

Standard

4.MD.5	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: 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 $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure angles. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
4.MD.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.

Unit Essential Questions:

- How can angles be identified based on their measurements?
- How can a protractor be used to measure angles?
- How can addition and subtraction be used to find out the measure of 2 non-overlapping, adjacent angles?

Unit Enduring Understandings:

- Students will identify, describe, and draw angles.
- Students will use a protractor to measure angles.
- Students will recognize angle measures as additive.

Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Identify, describe, and draw angles
- Use a protractor to measure angles
- Use addition and subtractions to find the missing measures of angles

Unit Vocabulary:

obtuse angle	acute angle	right angle	ray
endpoint	line segment	angle	vertex
degree	circle	protractor	

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Oral questions & answers
- Partner work
- Group work
- Individual work
- Worksheets
- Drawings
- Discussion

Suggested Teacher Resources:

Test/Resource Book	Manipulatives	Internet	Worksheets
Teacher manuals	Displays	Books	DVDs

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation/effort
- Tests
- Oral responses

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<p>Content Area: Mathematics Unit Number and Title: VII. Geometry Grade Level: Grade 4</p>
<p>Unit Summary:</p> <ul style="list-style-type: none"> • Draw and identify lines and angles, and classify shapes by properties of their lines and angles
<p>Primary Interdisciplinary Connections: Language Arts, Social Studies, Science & Technology</p>
<p>21st Century Themes: <u> X </u> Global Awareness <u> X </u> Financial, economic, business, and entrepreneurial literacy <u> X </u> Civic Literacy <u> X </u> Health Literacy</p>

Learning Targets

Domain: 4.G – Geometry	
Standard #	Standard
4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
4.G.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.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.

<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How do points, lines, line segments, rays and angles differ? • How do right, acute, and obtuse angles differ? • How can two-dimensional figures be classified based on parallel or perpendicular lines? • How is a right triangle different from other triangles? • How can a two-dimensional figure be folded into symmetric parts? • How can figures be identified as symmetric? • How can two-dimensional figures have one or more than one line of symmetry? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Students understand and apply concepts involving lines, line segments, rays, and angles. • Students use understanding of measurement of angles to classify them. • Students use understanding of perpendicular and parallel lines to classify two-dimensional figures. • Students use understanding of right angles to identify right triangles. • Students understand that a figure having a line of symmetry will have matching parts on both sides. <p>• Students understand that a figure may have</p>
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	several lines of symmetry, one line of symmetry, or no lines of symmetry.
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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Draw points, lines, line segments, rays, and angles
- Classify/identify right, acute, and obtuse angles
- Identify and draw perpendicular and parallel lines
- Classify two-dimensional figures
- Recognize right triangles
- Identify line symmetry of two-dimensional figures

Unit Vocabulary:

point	line	line segment	endpoint
angle	ray	plane	dimension
one-dimensional	two-dimensional	vertex	degree
right angle	obtuse angle	acute angle	straight angle
intersecting lines	parallel lines	perpendicular lines	congruent
similar			

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Oral questions & answers
- Partner work
- Group work
- Individual work
- Worksheets
- Drawings
- Discussion

Suggested Teacher Resources:

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Test/Resource Book	Manipulatives	Internet	Worksheets
Teacher manuals	Displays	Books	DVDs

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation/effort
- Tests
- Oral responses

KITTATINNY REGION
MATHEMATICS CURRICULUM

[rev. 6/1/11]

<p>Content Area: Mathematics Unit Number and Title: I. Operations and Algebraic Thinking Grade Level: Grade 5</p>
<p>Unit Summary:</p> <ul style="list-style-type: none"> • The use of numeric symbols and evaluating expressions with these symbols is essential to developing an understanding of number sense. • Students’ abilities to analyze patterns are essential to understanding connections between numerical relationships.
<p>Primary Interdisciplinary Connections: Science, Technology</p>
<p>21st Century Themes: <input checked="" type="checkbox"/> Global Awareness <input checked="" type="checkbox"/> Financial, economic, business, and entrepreneurial literacy <input type="checkbox"/> Civic Literacy <input type="checkbox"/> Health Literacy</p>

Learning Targets

Domain: 5.OA – Operations and Algebraic Thinking

Standard #	Standard
5.OA.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
5.OA.2	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
5.OA.3	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How are expressions used? • How do you evaluate expressions? • How can you demonstrate each of the properties of operations? • How can you use the properties to answer questions? • What relationships can equations show? • How do you solve equations? • How do tables help organize functions? • What can you use to identify and extend patterns? • What patterns can help answer questions? • How can I identify and graph points on a coordinate grid? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Students translate words into algebraic expressions. • Students use patterns to show relationships and evaluate algebraic expressions. • Students write and evaluate expressions involving multiplication, division, addition, and subtraction. • Students graph ordered pairs on a coordinate plane. • Students complete a table of values for an equation or write an equation to describe the relationship between pairs of numbers in a table.
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Mathematical Practices (1-8): 1, 2, 3, 4, 6, 7

Unit Learning Targets:

Students will:

- Write numerical and algebraic expressions
- Evaluate numerical and algebraic expressions using the order of operations
- Write equations for words and word problems
- Write and solve equations with and without variables
- Represent a function with a table and an equation
- Identify, describe, predict, and extend numeric patterns
- Develop a working understanding of the Commutative, Associative, Zero, Identity, and Distributive Properties

Unit Vocabulary:

Expression	X-coordinate
Numerical Expression	Y-coordinate
Variable	X-axis
Algebraic expression	Y-axis
Evaluate	Origin
Equation	Distributive Property
Solution	Addition Property of Equality
Coordinate Grid	Subtraction Property of Equality
Coordinate Plane	Multiplication Property of Equality
Ordered Pairs	Division Property of Equality

Evidence of Learning

Suggested Formative Assessment Activities:

- Group Work
- Individual Work
- Partner Work
- Worksheets
- Quizzes
- Exams
- Homework
- Oral Questions
- Student Participation
- Projects

Suggested Teacher Resources:

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MATHEMATICS CURRICULUM

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Text/Resource Books

Internet

Worksheets

Teacher Manual

DVDs

Manipulatives

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation
- Tests/Exams
- Quizzes
- Projects

KITTATINNY REGION
MATHEMATICS CURRICULUM

[rev. 6/1/11]

<p>Content Area: Mathematics Unit Number and Title: II. Number and Operations in Base Ten Grade Level: Grade 5</p>
<p>Unit Summary:</p> <ul style="list-style-type: none"> Understand the place value system
<p>Primary Interdisciplinary Connections: Science, Technology, Careers</p>
<p>21st Century Themes: <u> X </u> Global Awareness <u> X </u> Financial, economic, business, and entrepreneurial literacy <u> </u> Civic Literacy <u> </u> Health Literacy</p>

Learning Targets

Domain: 5.NBT – Number and Operations in Base Ten	
Standard #	Standard
5.NBT.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
5.NBT.2	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
5.NBT.3.a	Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
5.NBT.3.b	b. Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparison
5.NBT.4	Use place value understanding to round decimals to any place.
<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> How do place value patterns help you to understand large numbers? How do you round decimal numbers? How can I use patterns to understand and use whole number and decimal place value? How can I show the same whole numbers and 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> Students write the standard, expanded, and word form of whole numbers and identify the values of digits in whole numbers. Students compare and order whole numbers. Students write decimals in standard form, word

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<p>decimals in different ways? (standard form, expanded form, equivalent decimals, etc.)</p> <ul style="list-style-type: none"> • How can I use patterns to compare and order whole numbers and decimals? 	<p>form, and expanded form through thousandths.</p> <ul style="list-style-type: none"> • Students compare and order decimals through thousandths
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Mathematical Practices (1-8): 1, 2, 3, 4, 6, 7, 8

Unit Learning Targets:

Students will:

- Read and write whole numbers through billions.
- Use place value and number lines to compare and order whole numbers.
- Round decimal numbers to a given place value.
- Read and write decimals through thousandths.
- Use models and place value to compare and order decimals.
- Identify and write equivalent decimals.
- Read and write numbers in expanded form, word form, and standard form.

Unit Vocabulary:

Digits	Value
Standard form	Expanded form
Word form	Tenths
Hundredths	Thousandths
Equivalent Decimals	Million
Billion	Period
Estimate	Underestimate
Overestimate	Inverse Operations

Evidence of Learning

Suggested Formative Assessment Activities:

- Group Work
- Individual Work
- Partner Work
- Worksheets
- Quizzes
- Exams
- Homework
- Oral Questions
- Student Participation
- Projects

Suggested Teacher Resources:

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Text/Resource Books

Internet

Worksheets

Teacher Manual

DVDs

Manipulatives

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation
- Tests/Exams
- Quizzes
- Projects

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<p>Content Area: Mathematics Unit Number and Title: III. Number and Operations in Base Ten Grade Level: Grade 5</p>
<p>Unit Summary:</p> <ul style="list-style-type: none"> Perform operations with multi-digit whole numbers and with decimals to hundredths.
<p>Primary Interdisciplinary Connections: Science, Technology, Careers</p>
<p>21st Century Themes: <input checked="" type="checkbox"/> Global Awareness <input checked="" type="checkbox"/> Financial, economic, business, and entrepreneurial literacy <input type="checkbox"/> Civic Literacy <input type="checkbox"/> Health Literacy</p>

Learning Targets

Domain: 5.NBT – Number and Operations in Base Ten	
Standard #	Standard
5.NBT.5	Fluently multiply multi-digit whole numbers using the standard algorithm.
5.NBT.6	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
5.NBT.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> How is adding and subtracting decimals similar to adding and subtracting whole numbers? How do you use basic multiplication facts and patterns to find products? How are decimal numbers multiplied? How would you use front-end estimation to estimate products? How do you multiply multi-digit numbers? How can you use compatible numbers to estimate quotients? How do you divide with a single-digit divisor? How is the division algorithm expanded for dividing by 2-digit divisors? How do you divide decimals by whole numbers? What kinds of patterns do you see in division? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> Students use rounding and compatible numbers to estimate sums and differences of whole numbers and decimals. Students compute sums and differences of two large whole numbers and decimals. Students compute products of whole numbers and decimals using place-value patterns. Students use the traditional algorithm to multiply multi-digit whole numbers and decimals. Students use estimation to find approximate solutions to quotients with two-digit divisors using compatible numbers. Students find quotients with a two-digit divisor that is a multiple of ten. Students solve problems involving division of
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	whole numbers and decimals with 4 or 5 digits by a 2-digit divisor.
Mathematical Practices (1-8): 1, 2, 3, 4, 6, 7, 8	
Unit Learning Targets:	
<p>Students will:</p> <ul style="list-style-type: none"> • Add and subtract whole numbers and decimals • Estimate sums and differences of whole numbers and decimals using front-end estimation • Multiply whole numbers and decimals with multi-digit factors • Divide whole numbers and decimals numbers with 1- and 2-digit divisors • Estimate products of whole numbers and decimals using front-end estimation • Estimate quotients of whole numbers and decimals using compatible numbers 	
Unit Vocabulary:	
Estimate	Round
Compatible numbers	Product
Factor	Quotient
Divisor	Dividend
Remainder	Decimal
Tenth	Hundredth
Thousandth	Equivalent Decimals
Multiple	Overestimate
Underestimate	Sum
Difference	Addend
Subtrahend	Minuend

Evidence of Learning

Suggested Formative Assessment Activities:

- Group Work
- Individual Work
- Partner Work
- Worksheets
- Quizzes
- Exams
- Homework
- Oral Questions
- Student Participation
- Projects

Suggested Teacher Resources:

Text/Resource Books	Internet	Worksheets	Teacher Manual
DVDs	Manipulatives		

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation
- Tests/Exams
- Quizzes
- Projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: IV. Number and Operations – Fractions
Grade Level: Grade 5

Unit Summary:

- Use equivalent fractions as a strategy to add and subtract fractions.

Primary Interdisciplinary Connections: Science, Technology, Careers

21st Century Themes:

Global Awareness Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 5.NF – Number and Operations - Fractions

Standard #

Standard

5.NF.1

Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

5.NF.2

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Unit Essential Questions:

- How do you add and subtract like-fractions?
- Why is it more difficult to add and subtract unlike-fractions than it is to add like-fractions?
- How does using a least common denominator differ from using any common denominator?
- How can you find sums and differences of mixed numbers?

Unit Enduring Understandings:

- Students use models and computational procedures to add and subtract fractions with like- and unlike-denominators
- Students determine common multiples and least common multiples of numbers
- Students use models and computational procedures to add and subtract mixed numbers
- Students identify fractions that are in simplest form and find the simplest form of a fraction
- Students determine common factors and the greatest common factors of numbers

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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Identify and write equivalent fractions.
- Write fractions in simplest form.
- Rename improper fractions and mixed numbers.
- Identify multiples and the least common multiple of a set of whole numbers.
- Identify factors and the greatest common factor of a set of whole numbers.
- Add and subtract like- and unlike-fractions using common denominators.
- Add and subtract mixed numbers.

Unit Vocabulary:

Numerator

Denominator

Sum

Difference

Common multiple

Least common multiple

Least common denominator

Mixed number

Common factor

Greatest common factor

Simplest form / lowest terms

Improper fraction

Proper fraction

Equivalent fractions

Evidence of Learning

Suggested Formative Assessment Activities:

- Group Work
- Individual Work
- Partner Work
- Worksheets
- Quizzes
- Exams
- Homework
- Oral Questions
- Student Participation
- Projects

Suggested Teacher Resources:

Text/Resource Books

Internet

Worksheets

Teacher Manual

DVDs

Manipulatives

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Suggested Summative Assessment Activities:

- Teacher observation
- Student participation
- Tests/Exams
- Quizzes
- Projects

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MATHEMATICS CURRICULUM

[rev. 6/1/11]

Unit Overview

Content Area: Mathematics
Unit Number and Title: V. Number and Operations – Fractions
Grade Level: Grade 5

Unit Summary:

- Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Primary Interdisciplinary Connections: Science, Technology, Careers

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 ___ Civic Literacy ___ Health Literacy

Learning Targets

Domain: 5.NF – Number and Operations - Fractions

Standard #	Standard
5.NF.3	Interpret a fraction as division of the numerator by the denominator. Solve word problems involving division of whole numbers leading to answer in the form of fractions or mixed numbers.
5.NF.4	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
5.NF.4.a	Interpret the product of a fraction as a whole number.
5.NF.4.b	Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
5.NF.5	Interpret multiplication as scaling (resizing)
5.NF.5.a	Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication
5.NF.5.b	Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number, and conversely with numbers smaller than 1.
5.NF.6	Solve real world problems involving multiplication of fractions and mixed numbers.

Unit Essential Questions:

- How do you multiply fractions and whole numbers?
- How do you multiply fractions and mixed numbers?
- How do you multiply two fractions?

Unit Enduring Understandings:

- Students multiply a fraction by a whole number.
- Students multiply two fractions.
- Students multiply mixed numbers.
- Students multiply fractions, mixed numbers, and whole numbers.

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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Solve problems by multiplying fractions.
- Solve problems by multiplying fractions and whole numbers.
- Multiply two mixed numbers.

Unit Vocabulary:

Numerator	Denominator
Mixed number	Reciprocal
Greatest common factor	

Evidence of Learning

Suggested Formative Assessment Activities:

- Group Work
- Individual Work
- Partner Work
- Worksheets
- Quizzes
- Exams
- Homework
- Oral Questions
- Student Participation
- Projects

Suggested Teacher Resources:

Text/Resource Books	Internet	Worksheets	Teacher Manual
DVDs	Manipulatives		

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Suggested Summative Assessment Activities:

- Teacher observation
- Student participation
- Tests/Exams
- Quizzes
- Projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: VI. – Number and Operations – Fractions
Grade Level: Grade 5

Unit Summary:

- Apply and extend previous understandings of multiplication and division to multiply and divide fractions

Primary Interdisciplinary Connections: Science, Technology, Careers

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 5.NF – Number and Operations – Fractions

Standard #

Standard

5.NF.7	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.
5.NF.7.a	Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.
5.NF.7.b	Interpret division of a whole number by a unit fraction, and compute such quotients.
5.NF.7.c	Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions.

Unit Essential Questions:

- In what ways can you divide fractions?
- How do you divide fractions and mixed numbers?
- How do you divide two fractions using multiplication?

Unit Enduring Understandings:

- Students use multiplication to divide fractions
- Students find quotients involving mixed numbers

Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Divide whole numbers by fractions.
- Divide fractions by fractions.
- Divide mixed numbers.

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Unit Vocabulary:

Numerator
Mixed number

Denominator
Reciprocal_

Evidence of Learning

Suggested Formative Assessment Activities:

- Group Work
- Individual Work
- Partner Work
- Worksheets
- Quizzes
- Exams
- Homework
- Oral Questions
- Student Participation
- Projects

Suggested Teacher Resources:

Text/Resource Books

Internet

Worksheets

Teacher Manual

DVDs

Manipulatives

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation
- Tests/Exams
- Quizzes
- Projects

KITTATINNY REGION
MATHEMATICS CURRICULUM

[rev. 6/1/11]

Unit Overview

Content Area: Mathematics
Unit Number and Title: VII. Measurement and Data
Grade Level: Grade 5

Unit Summary:

- Convert similar measurement units within a given measurement system.
- Represent and interpret data.

Primary Interdisciplinary Connections: Science, Technology, Careers

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 5.MD – Measurement and Data

Standard #

Standard

5.MD.1	Convert among different-sized standard measurement units within a given measurement system, and use these conversions in solving multi-step, real world problems (metric and standard units of mass, capacity, linear, and temperature).
5.MD.2	Make a line plot to display a data set of measurements in fractions of a unit. Use operation son fractions for this grade to solve problems involving information presented in line plots.

Unit Essential Questions:

- How do you convert among customary units?
- How do you convert among metric units?
- How do you use line plots to solve problems?

Unit Enduring Understandings:

- Students use an understanding of metric prefixes to convert measurements within the metric system.
- Students use mass and weight to determine the amount of matter an object has and how heavy or light an object is.
- Students use a variety of customary units to measure liquid volume and linear measure.
- Students convert customary units of measure using multiplication and division
- Students use computational procedures to find changes in temperature in both Fahrenheit and Celsius units.
- Students make and read line plots as a way of solving problems (redistributing volumes).

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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Convert metric units of length, weight, capacity, and temperature.
- Convert customary units of length, weight, capacity, and temperature.
- Create line plots to represent data

Unit Vocabulary:

Capacity	Meters
Cup	Celsius
Customary units	Milli-
Fluid ounce	Centi-
Foot	Deci-
Gallon	Deca-
Mile	Hecto-
Ounce	Kilo-
Pound	Fahrenheit
Ton	Ton
Weight	Quart
Mass	Pint
Metric system	Degrees
Grams	
Liters	

Evidence of Learning

Suggested Formative Assessment Activities:

- Group Work
- Individual Work
- Partner Work
- Worksheets
- Quizzes
- Exams
- Homework
- Oral Questions
- Student Participation
- Projects

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Suggested Teacher Resources:

Text/Resource Books

Internet

Worksheets

Teacher Manual

DVDs

Manipulatives

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation
- Tests/Exams
- Quizzes
- Projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: VIII. Measurement and Data
Grade Level: Grade 5

Unit Summary:

- **Geometric measurement:** understand the concept of volume and relate volume to multiplication and to addition.

Primary Interdisciplinary Connections: Science, Technology, Careers

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 ___ Civic Literacy ___ Health Literacy

Learning Targets

Domain: 5.MD – Measurement and Data

Standard #	Standard
5.MD.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement
5.MD.3.a	A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume
5.MD.3.b	A solid figure which can be packed without gaps or overlaps using N unit cubes is said to have a volume of N cubic units
5.MD.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units
5.MD.5	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume
5.MD.5.a	Find the volume of a right rectangular prism with whole-number side lengths
5.MD.5.b	Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes for right rectangular prisms
5.MD.5.c	Recognize volume as additive by adding the volumes of the non-overlapping parts of two rectangular prisms

Unit Essential Questions:

- How do you find the volume of a rectangular prism by using models?
- How do you find the volume of a rectangular prism using a formula?

Unit Enduring Understandings:

- Students count cubic units and use formulas to find the volumes of rectangular prisms
- Students solve real world problems involving volume
- Students use models to find the volumes of prisms

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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Calculate the volume of a rectangular prism.
- Recognize that total volume can be found by finding the sum of two non-overlapping right rectangular prisms

Unit Vocabulary:

Volume	Cubic unit
Length	Width
Height	Dimensions
Formula	Base
Product	Rectangular prism

Evidence of Learning

Suggested Formative Assessment Activities:

- Group Work
- Individual Work
- Partner Work
- Worksheets
- Quizzes
- Exams
- Homework
- Oral Questions
- Student Participation
- Projects

Suggested Teacher Resources:

Text/Resource Books	Internet	Worksheets	Teacher Manual
DVDs	Manipulatives		

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation
- Tests/Exams
- Quizzes
- Projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: IX. Geometry
Grade Level: Grade 5

Unit Summary:

- Graph points on the coordinate plane to solve real-world and mathematical problems.

Primary Interdisciplinary Connections: Science, Technology, Careers

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 5.G – Measurement and Data

Standard #

Standard

5.G.1

Use axes to define a coordinate system, and plot coordinate pairs.

5.G.2

Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane.

Unit Essential Questions:

- How can you locate points on a coordinate grid?
- How do you find a distance on a number line or axis?
- How do you graph an equation on a coordinate grid?
- How do you plot data from an input-output table onto a coordinate grid?

Unit Enduring Understandings:

- Students identify and graph points on a coordinate plane
- Students use number lines and the coordinate plane to find distances involving positive and negative numbers
- Students make a table of x- and y-values for an equation. Students then use the ordered pairs to graph the equation
- Students graph points from an input-output table onto a coordinate plane

Mathematical Practices (1-8): 1, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Understand that an ordered pair is used to locate a point on a coordinate grid
- Find the distance between two points on a horizontal or vertical line in the coordinate plane
- Understand that ordered pairs can be used to graph equations on a coordinate plane
- Graph relationships from input-output tables

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Unit Vocabulary:

Integers	Coordinate grid
Coordinate plane	X-axis
Y-axis	Origin
Ordered pair	X-coordinate
Y-coordinate	Linear equation
Table of values	

Evidence of Learning

Suggested Formative Assessment Activities:

- Group Work
- Individual Work
- Partner Work
- Worksheets
- Quizzes
- Exams
- Homework
- Oral Questions
- Student Participation
- Projects

Suggested Teacher Resources:

Text/Resource Books	Internet	Worksheets	Teacher Manual
DVDs	Manipulatives		

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation
- Tests/Exams
- Quizzes
- Projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: X. Geometry
Grade Level: Grade 5

Unit Summary:

- Classify two-dimensional figures into categories based on their properties.

Primary Interdisciplinary Connections: Science, Technology, Careers

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 5.G – Geometry

Standard #

Standard

5.G.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

5.G.4 Classify two-dimensional figures in a hierarchy based on properties.

Unit Essential Questions:

- How can you measure an angle?
- How do you name a polygon?
- How can you classify triangles?
- How can you classify quadrilaterals?

Unit Enduring Understandings:

- Students measure, draw, and classify angles
- Students identify and classify polygons
- Students identify and classify triangles
- Students identify and classify quadrilaterals

Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Understand that a number can be used to describe the size of an angle’s opening
- Understand that some polygons have special names that tell how many sides that polygon has
- Classify triangles according to the lengths of their sides or the measures of their angles
- Classify quadrilaterals by the properties of their sides and angles
- Compare and contrast how figures are alike and different

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Unit Vocabulary:

Line
Ray
Parallel lines
Intersecting lines
Perpendicular lines
Point
Line segment
Plane
Angle
Acute angle
Right angle
Obtuse angle
Straight angle
Vertex
Protractor
Degrees
Polygon
Regular polygon
Triangle
Quadrilateral
Pentagon
Hexagon
Octagon
Equilateral triangle
Isosceles triangle
Scalene triangle
Right triangle
Acute triangle
Obtuse triangle
Parallelogram
Trapezoid
Rectangle
Rhombus
Square

Evidence of Learning

Suggested Formative Assessment Activities:

- Group Work
- Individual Work
- Partner Work
- Worksheets
- Quizzes
- Exams
- Homework
- Oral Questions
- Student Participation
- Projects

Suggested Teacher Resources:

Text/Resource Books

Internet

Worksheets

Teacher Manual

DVDs

Manipulatives

Suggested Summative Assessment Activities:

- Teacher observation
- Student participation
- Projects
- Tests/Exams
- Quizzes

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MATHEMATICS CURRICULUM

[rev. 6/1/11]

Unit Overview

Content Area: Mathematics
Unit Number and Title: I. Ratios and Proportional Relationships
Grade Level: Grade 6

Unit Summary:

- Understand ratio concepts and use ratio reasoning to solve problems.

Primary Interdisciplinary Connections: Language Arts, Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy Health Literacy

Learning Targets

Domain: 6.RP – Ratios and Proportional Relationships

Standard #	Standard
6.RP.1	Understand the concept of a ratio and use language to describe a ratio relationship between two quantities.
6.RP.2	Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the content of a ratio relationship.
6.RP.3	Use ratio and rate reasoning to solve real-world and mathematical problems.
6.RP.3.a	Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
6.RP.3.b	Solve unit rate problems including those involving unit pricing and constant speed.
6.RP.3.c	Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, given a part and the percent.
6.RP.3.d	Use ratio reasoning to convert measurement units

Unit Essential Questions:

- What is a ratio?
- What is a proportion?
- What is a rate/unit rate?
- How are decimals, fractions, and percents related?
- How do you find a percent of a number?
- How do you find tips, sales tax, discount and simple interest?

Unit Enduring Understandings:

- A ratio is a relationship between two quantities where for every x units of one quantity there are y units of another quantity.
- In a proportional relationship there are an infinite number of ratios equal to the ratio in lowest terms or constant ratio.
- A rate is a special ratio that compares two quantities with different units of measure. A unit rate is a rate that compares a quantity to one unit of another quantity.
- A part of a whole or part of a set can be represented by a fraction, decimal, and a percent.

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	<ul style="list-style-type: none"> You can find a percent of a number by changing the percent to a decimal and multiplying, or by using a proportion.
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Mathematical Practices (1-8): 1, 2, 3, 5, 6, 8

Unit Learning Targets:

Students will:

- Use ratio language to describe a ratio relationship between two quantities
- Calculate rates and unit rates
- Solve real-world and mathematical problems using rate and rate reasoning
- Solve problems involving finding the whole, given a part and the percent
- Calculate tips, sales tax, discount, and simple interest

Unit Vocabulary:

Ratio	Terms	Proportion	Rate	Unit Rate	Percent
Principal	Simple Interest	Discount	Tax	Tip	

Evidence of Learning

Suggested Formative Assessment Activities:

- Group work
- Individual work
- Partner work
- Worksheets
- Drawings
- Discussion
- Questions and answers
- Students work on board
- Oral responses
- Open-ended problems

Suggested Teacher Resources:

Textbooks, DVDs, Internet, Worksheets

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Suggested Summative Assessment Activities:

- Student participation/effort
- Homework
- Tests
- Projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: II. The Number System
Grade Level: Grade 6

Unit Summary:

- Apply and extend previous understandings of multiplication and division to divide fractions.
- Compute fluently with multi-digit numbers and find common factors and multiples.
- Apply and extend previous understandings of number sets to the system of rational numbers.

Primary Interdisciplinary Connections: Language Arts, Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy Health Literacy

Learning Targets

Domain: 6.NS – The Number System

Standard #	Standard
6.NS.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions.
6.NS.2	Fluently divide multi-digit numbers using the standard algorithm.
6.NS.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
6.NS.4	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12.
6.NS.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values.
6.NS.6.	Understand a rational number as a point on the number line.
6.NS.6.a	Recognize opposite signs of numbers as indication locations on opposite sides of 0 on the number line.
6.NS.6.b	Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane.
6.NS.6.c	Find and position integers and other rational numbers on a horizontal or vertical number line.
6.NS.7	Understand ordering and absolute value of rational numbers
6.NS.7.a	Interpret statements of inequality as statements about the relative position of two numbers on a number line.
6.NS.7.b	Understand the absolute value of a rational number as its distance from 0 on the number line.
6.NS.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane.

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<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • What are the standard algorithms for multiplying and dividing whole numbers, fractions, and decimals? • What is the process for finding the greatest common factor and least common denominator of a pair of numbers? • How are positive and negative numbers used to represent quantities in the real world? • What is absolute value? • How are ordered pairs graphed in the coordinate plane? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Be able to fluently calculate products and quotients of whole numbers, fractions, and decimals. • Be able to calculate the greatest common factor and least common multiple of a pair of numbers. • Use positive and negative numbers to represent quantities in real-world contexts. • Knowledge that absolute value of a rational number is its distance from 0 on the number line. • Be able to graph ordered pairs in all four quadrants in the coordinate plane. 																
<p>Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8</p>																	
<p>Unit Learning Targets:</p> <p>Students will:</p> <ul style="list-style-type: none"> • Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions. • Fluently divide multi-digit numbers. • Fluently add, subtract, multiply, and divide decimals. • Find the greatest common factor (GCF) and the least common multiple (LCM) of two whole numbers. • Use positive and negative numbers to represent quantities in real-world contexts. • Represent rational numbers on a number line. • Graph ordered pairs in all four quadrants of the coordinate plane. • Interpret statements of inequality as statements about the relative positions of two numbers on a number line. • Understand that absolute value is a number's distance from 0 on the number line. 																	
<p>Unit Vocabulary:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 25%;">Greatest Common Factor</td> <td style="width: 25%;">Least Common Multiple</td> <td style="width: 25%;">Positive Integers</td> <td style="width: 25%;">Negative Integers</td> </tr> <tr> <td>Rational Numbers</td> <td>Opposites</td> <td>Inequality</td> <td>Absolute Value</td> </tr> <tr> <td>Quotient</td> <td>Quadrants</td> <td>Coordinate Plane</td> <td>Factors</td> </tr> <tr> <td>Multiples</td> <td>Ordered Pair</td> <td></td> <td></td> </tr> </table>		Greatest Common Factor	Least Common Multiple	Positive Integers	Negative Integers	Rational Numbers	Opposites	Inequality	Absolute Value	Quotient	Quadrants	Coordinate Plane	Factors	Multiples	Ordered Pair		
Greatest Common Factor	Least Common Multiple	Positive Integers	Negative Integers														
Rational Numbers	Opposites	Inequality	Absolute Value														
Quotient	Quadrants	Coordinate Plane	Factors														
Multiples	Ordered Pair																

Evidence of Learning

Suggested Formative Assessment Activities:

- Group work
- Individual work
- Partner work
- Worksheets
- Drawings
- Discussion
- Questions and answers
- Students work on board
- Oral responses
- Open-ended questions

Suggested Teacher Resources: Textbooks, DVDs, Internet, Worksheets

Suggested Summative Assessment Activities:

- Student participation/effort
- Homework
- Tests
- Projects

KITTATINNY REGION
MATHEMATICS CURRICULUM

[rev. 6/1/11]

Unit Overview

Content Area: Mathematics
Unit Number and Title: III. Expressions and Equations
Grade Level: Grade 6

Unit Summary:

- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.

Primary Interdisciplinary Connections: Language Arts, Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy Health Literacy

Learning Targets

Domain: 6.EE – Expressions and Equations

Standard #	Standard
6.EE.1	Write and evaluate numerical expressions involving whole-number exponents.
6.EE.2	Write, read, and evaluate expressions in which letters stand for numbers.
6.EE.2.a	Write expressions that record operations with numbers and with letters standing for numbers.
6.EE.2.b	Identify parts of an expression using mathematical terms; view one or more parts of an expression as a single entity.
6.EE.2.c	Evaluate expressions at specific values of their variables.
6.EE.3	Apply the properties of operations to generate equivalent expressions.
6.EE.4	Identify when two expressions are equivalent
6.EE.5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true?
6.EE.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
6.EE.7	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q , and x are all nonnegative rational numbers.
6.EE.8	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
6.EE.9	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity (dependent variable), in terms of the other quantity (independent variable). Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

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<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • What are algebraic expressions and how can they be written and evaluated? • What arithmetic number relationships, called properties, are always true? • What procedures can be used to solve equations? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Some mathematical phrases can be represented using a variable in an algebraic expression. • The value of an algebraic expression can be found by replacing the variable(s) with given number(s) and doing the calculations that result. • There is an agreed upon order in which operations are carried out in a numerical expression (called the order of operations). • The same number can be added to or subtracted from both sides of an equation without changing the equality. Similarly, multiplying or dividing both sides of an equation by the same nonzero number does not change the equality. • Solving an equation involves finding the value of the unknown (variable) that makes the equation true. 															
<p>Unit Learning Targets:</p> <p>Students will:</p> <ul style="list-style-type: none"> • Write numerical expressions containing variables to represent relations expressed verbally • Give missing addends and factors in equations, and state the property used • Evaluate numeric or algebraic expressions with three or more numbers and up to three variables • Use the correct order of operations to evaluate expressions • Use the Distributive Property to evaluate expressions and to compute mentally • Evaluate algebraic expressions using substitution • Use the properties of equality to balance equations • Use inverse operations to isolate the variable and solve one-step addition and subtraction equations • Solve one-step multiplication and division equations 																
<p>Unit Vocabulary:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Commutative Property of Addition/Multiplication</td> <td style="width: 33%;">Distributive Property</td> <td style="width: 33%;"></td> </tr> <tr> <td>Associative Property of Addition/Multiplication</td> <td>Substitution</td> <td>Input/Output Table</td> </tr> <tr> <td>Identity Property of Addition/Multiplication</td> <td>Inequality</td> <td>Inverse Relationship</td> </tr> <tr> <td>Algebraic Expression</td> <td>Evaluate</td> <td>Variable</td> </tr> <tr> <td>Equation</td> <td>Order of Operations</td> <td></td> </tr> </table>		Commutative Property of Addition/Multiplication	Distributive Property		Associative Property of Addition/Multiplication	Substitution	Input/Output Table	Identity Property of Addition/Multiplication	Inequality	Inverse Relationship	Algebraic Expression	Evaluate	Variable	Equation	Order of Operations	
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Associative Property of Addition/Multiplication	Substitution	Input/Output Table														
Identity Property of Addition/Multiplication	Inequality	Inverse Relationship														
Algebraic Expression	Evaluate	Variable														
Equation	Order of Operations															

Evidence of Learning

Suggested Formative Assessment Activities:

- Group work
- Individual work
- Partner work
- Worksheets
- Drawings
- Discussion
- Questions and answers
- Student work on board
- Oral responses
- Open-ended questions

Suggested Teacher Resources: Textbooks, DVDs, Internet, Worksheets

Suggested Summative Assessment Activities:

- Students participation/effort
- Homework
- Tests
- Projects

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MATHEMATICS CURRICULUM

[rev. 6/1/11]

Unit Overview

Content Area: Mathematics
Unit Number and Title: IV. Geometry
Grade Level: Grade 6

Unit Summary:

- Solve real-world and mathematical problems involving area, surface area, and volume.

Primary Interdisciplinary Connections: Science

21st Century Themes:

Global Awareness Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 6.G - Geometry

Standard #

Standard

6.G.1	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
6.G.2	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
6.G.3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
6.G.4	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Unit Essential Questions:

- What are the meanings of perimeter and area?
- How can the perimeter and area of certain shapes be found?
- What is the meaning of volume and how can volume be found?
- What is the meaning of surface area and how can surface area be found?
- How can the volume of certain figures be found?

Unit Enduring Understandings:

- The distance around a figure is its perimeter.
Formulas exist for finding the perimeter of some polygons and some formulas may be represented in more than one way.
- The amount of space inside a shape is its area, and area can be found using square units. The area of some irregular shapes can be found by decomposing the shape into polygons for which formulas exist for finding areas.

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- How can polygons be drawn in the coordinate plane?

- The formula for area of a parallelogram is derived from the formula for area of a rectangle. The formula for area of a triangle is derived from the formula for area of a parallelogram.
- Formulas for finding the areas of polygons can be used to find the surface area of some solids.
- Volume is a measure of the amount of space inside a solid figure. Volume can be measured by counting the number of cubic units needed to fill a three-dimensional object.

Unit Learning Targets:

Students will:

- Find the areas of rectangles and irregular figures
- Find the areas of parallelograms and triangles
- Find the surface areas of prisms, cylinders, and pyramids
- Find the volume of a rectangular prism
- Draw polygons in the coordinate plane when given coordinates for the vertices, and find the length of a side joining points with the same first coordinate or the same second coordinate

Unit Vocabulary:

Area	Polyhedron	Faces	Edges	Vertex	Cylinder
Prism	Pyramid	Net	Volume	Quadrant	Cone
Coordinate Plane		Surface Area			

Evidence of Learning

Suggested Formative Assessment Activities:

- Group work
- Individual work
- Partner work
- Worksheets
- Drawings
- Discussion
- Questions and answers
- Student work on board
- Oral responses
- Open-ended questions

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Suggested Teacher Resources: Textbooks, DVDs, Internet, Worksheets

Suggested Summative Assessment Activities:

- Student participation/effort
- Homework
- Tests
- Projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: V. Statistics and Probability
Grade Level: Grade 6

- Unit Summary:**
- Develop understanding of statistical variability
 - Summarize and describe distributions

Primary Interdisciplinary Connections: Science

21st Century Themes:
 Global Awareness **Financial, economic, business, and entrepreneurial literacy**
 Civic Literacy **Health Literacy**

Learning Targets

Domain: 6.SP – Statistics and Probability

Standard #	Standard
6.SP.1	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.
6.SP.2	Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
6.SP.3	Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
6.SP.4	Display numerical data in plots on a number line, including dot points, histograms, and box plots.
6.SP.5.a	Summarize numerical data sets in relation to their context by reporting the number of observations.
6.SP.5.b	Summarize numerical data sets in relation to their context by describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
6.SP.5.c	Summarize numerical data sets in relation to their context by giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
6.SP.5.d	Summarize numerical data sets in relation to their context by relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

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Unit Essential Questions:

- How can graphs be used to represent data and answer questions?
- What determines the type of graph that is best suited for the given set of data?
- How do different types of graphs represent data differently?
- How can you describe a set of data?
- Which measure of central tendency is most useful to describe a given situation?
- How can the probability of an event be found?
- What are different methods for finding the number of possible outcomes of an event?
- How can all possible outcomes be counted?
- How is probability expressed?
- What is experimental probability?

Unit Enduring Understandings:

- Each type of graph is most appropriate for certain kinds of data.
- Some problems can be solved by making, reading, and analyzing a graph.
- The best descriptor of the ‘center’ of numerical data is determined by the nature of the data and the question to be answered.
- Organizing data makes it easier to find measures of central tendency (mean, median, mode), and the range.
- The center of numerical data, the spread of the data, and graphs representing the data can be analyzed and interpreted to draw conclusions.
- Counting techniques exist for finding the number of possible combinations. The outcomes of an event can be represented pictorially using a tree diagram or an organized list.
- The probability of an event occurring can be expressed as a number between 0 and 1, inclusive.
- Experiments can be used to estimate the probability of an event occurring, and used to make predictions related to that event.

Mathematical Practices (1-8): 1, 2, 3, 5, 6, 8

Unit Learning Targets:

Students will:

- Read, make and interpret bar, line, and circle graphs
- Determine the most appropriate type of graph for a certain set of data
- Compare graphs and identify misleading graphs
- Find the range of a set of data; find the mean, mode, median, and choose the measure that best represents the ‘average’ of a given set of data
- Find all possible outcomes of a compound event by drawing a tree diagram, making a list, making a grid, or multiplying
- Express the probability of an event as a fraction, decimal, or percent
- Use experimental probability to predict results

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Unit Vocabulary:

Bar Graph	Line Graph	Circle Graph	Trend	Range	Mean
Median	Mode	Histogram	Frequency	Table	Outlier
Stem-and-Leaf Plot		Survey	Sample	Population	Event
Counting Principle		Tree Diagram	Probability	Permutation	Combination
Experimental Probability		Outcome			

Evidence of Learning

Suggested Formative Assessment Activities:

- Group work
- Individual work
- Partner work
- Worksheets
- Drawings
- Discussion
- Questions and answers
- Student work on board
- Oral responses
- Open-ended questions

Suggested Teacher Resources: Textbooks, DVDs, Internet, Worksheets

Suggested Summative Assessment Activities:

- Student participation/effort
- Homework
- Tests
- Projects

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[rev. 6/1/11]

Unit Overview

Content Area: Mathematics
Unit Number and Title: I. Ratios & Proportional Relationships
Grade Level: Grade 7

Unit Summary:

- Analyze proportional relationships and use them to solve real-world and mathematical problems.

Primary Interdisciplinary Connections: Social Studies, Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 7.RP – Ratios and Proportional Relationships

Standard #	Standard
7.RP.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
7.RP.2.a	Recognize and represent proportional relationships between quantities
7.RP.2.b	Decide whether two quantities are in a proportional relationship
7.RP.2.c	Represent proportional relationships by equations.
7.RP.3	Use proportional relationships to solve multi-step ratio and percent problems.

Unit Essential Questions:

- What are ratios and rates, and how are they used in solving problems?
- How do you use ratios to express comparisons between two quantities?
- How do you determine if two ratios form a proportion?
- How do you find rates and unit rates?
- How do you find the following: simple interest, tax, markups, discounts, gratuities, commissions, fees, percents, percent increase and percent decrease?
- How do you use proportions to solve similar figure problems using correspondence?
- How do you use proportions to solve problems involving scale drawings?

Unit Enduring Understandings:

- A ratio is a special relationship between two quantities where for every x units of one quantity there are y units of another quantity.
- In a proportional relationship there are an infinite number of ratios equal to the lowest terms or constant ratio.
- A rate is a special ratio that compares two quantities with different units of measure.
- A unit rate is a rate that compares a quantity to one unit of another quantity.
- A percent is a special kind of ratio in which a part is compared to a whole with 100 parts. The whole is 100%. Percent is relative to the size of the whole.

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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Express comparisons as ratios in three ways (a/b, a to b, a:b).
- Find equal ratios and determine if two ratios form a proportion.
- Find the unit rate for a given rate.
- Compare and use rates to identify the better buy or the lower rate.
- Utilize percent skills for real life situations.

Unit Vocabulary:

Ratio	Rate	Unit Rate	Proportion	Percent
Discount	Interest	Mark-up	Mark-down	Percent Increase
Sales Tax	Similarity (optional)		Gratuity	Percent Decrease

Evidence of Learning

Suggested Formative Assessment Activities:

- Quiz
- Worksheets
- Open-Ended Problems
- Partner Work
- Discussion
- Menus
- Board Work
- Oral Responses
- Retail Advertisements

Suggested Teacher Resources:

Work Sheets Books Internet Study Island Word Find

Suggested Summative Assessment Activities:

- Test
- Project

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Unit Overview

Content Area: Mathematics
Unit Number and Title: II. The Number System
Grade Level: Grade 7

Unit Summary:

- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Primary Interdisciplinary Connections: Social Studies, Science

21st Century Themes:

 Global Awareness **Financial, economic, business, and entrepreneurial literacy**
 Civic Literacy **Health Literacy**

Learning Targets

Domain: 7.NS – The Number System

Standard #	Standard
7.NS.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
7.NS.1.a	Describe situations in which opposite quantities combine to make 0.
7.NS.1.b	Understand $p + q$ as the number located a distance $ q $ from p , in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
7.NS.1.c	Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
7.NS.1.d	Apply properties of operations as strategies to add and subtract rational numbers.
7.NS.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
7.NS.2.a	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
7.NS.2.b	Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-p/q = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.
7.NS.2.c	Apply properties of operations as strategies to multiply and divide rational numbers.

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7.NS.2.d	Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.
<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How can fractions be represented and simplified? • How can fractions be written as mixed numerals? • How can terminating and repeating decimals be described? • How can rational numbers be ordered? • How are integers related to whole numbers? • How can integers be represented on the number line? • How can integers be compared? • How can integers be added and subtracted by using a number line? • How can integers be multiplied by using patterns and rules for multiplying? • How can integers be divided by using the relationship between multiplication and division and the rules for dividing integers? • How does multiplication extend into the distributive property? <p style="text-align: center;">-</p>	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Locate and place fractions on a number line. • Identify and write equivalent fractions and decimals. • Write improper fractions as mixed numbers and mixed numbers as improper fractions, and then place them on a number line. • Find equivalent decimals for fractions and mixed numbers, and change terminating decimals to fractions and mixed numbers. • Numbers that are the same distance from 0 on the number line are opposites. Integers are the counting numbers, their opposites, and zero. • Each rational number can be associated with a unique point on the number line. • Addition and subtraction of integers can be modeled as moves on the number line. • Patterns show why rules for multiplying and dividing integers make sense. • The inverse relationship between multiplication and division can show why rules for dividing integers make sense. • Numbers to the right of 0 are positive and the numbers to the left of 0 are negative.
<p>Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8</p>	

Unit Learning

Students will:

- Describe fractions as part of a whole
- Write equivalent fractions
- Simplify fractions
- Write fractions as mixed numerals
- Order fractions, decimals, and mixed numerals on a number line
- Write terminating and repeating decimals as fractions
- Find opposites and absolute values
- Learn to compare, graph and order integers
- Add, subtract, multiply, and divide integers
- Understand the distributive property

Unit Vocabulary:

Rational Number	Horizontal	Vertical	Opposites	Positive
Negative	Additive Inverse	Absolute Value	Product	Quotient
Integers	Terminating	Repeating	Difference	Sum
Divisor	Dividend	Multiplicative Inverse		
Distributive Property				

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Worksheets
- Open-ended Problems
- Partner work
- Discussion
- Menus
- Board work
- Oral Responses

Suggested Teacher Resources:

Worksheets, books, Internet, Study Island, word finds

Suggested Summative Assessment Activities:

- Tests
- Project

KITTATINNY REGION
MATHEMATICS CURRICULUM

[rev. 6/1/11]

Unit Overview

Content Area: Mathematics
Unit Number and Title: III. Expressions and Equations
Grade Level: Grade 7

Unit Summary:

- Use properties of operations to generate equivalent expressions.
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Primary Interdisciplinary Connections: Social Studies, Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 7.EE – Expressions and Equations

Standard #	Standard
7.EE.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
7.EE.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
7.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
7.EE.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.
7.EE.4.b	Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.

Unit Essential Questions:

- How can equations be graphed?
- What patterns can be found in the graphs of equations?

Unit Enduring Understandings:

- Transform equations into equivalent equations.
- Solve equations using properties of equality and inverse operations.

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<ul style="list-style-type: none"> • How do you write an equation that involves one operation? • How do you write an equation that involves two operations? • How do you solve two step equations? • How do you solve two step equations involving addition, subtraction, multiplication and division? • How do you write a rule and an equation to find one value of a function when another value is known? • How do you graph a proportional relationship? • How do you graph a relationship involving addition? • How do you graph linear equations? • How do you use tables, graphs, and equations to identify functions? 	<ul style="list-style-type: none"> • Estimate solutions. • Utilize patterns to identify relationships between quantities. • Write equations to describe a relationship. • Recognize linear equations. • Understand that some mathematical relationships are not linear.
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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Transform equations into equivalent equations
- Solve equations using properties of equality and inverse operations
- Estimate solutions
- Utilize patterns to identify relationships between quantities
- Write an equation to describe a relationship
- Recognize linear equations
- Understand that some mathematical relationships are not linear
- Solve one- & two-step equations

Unit Vocabulary:

Variable	Factor	Multiple	Linear	Expression
Equation	Inequality	Coefficient	Multi-step	2-step
1-step	Convert	Estimation	Sequence	Solution
Order of Operations				

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Worksheets
- Open-ended Problems
- Partner work
- Discussion
- Board work
- Oral responses

Suggested Teacher Resources:

Worksheets, books, Internet, Study Island, word finds

Suggested Summative Assessment Activities:

- Tests
- Project

KITTATINNY REGION
MATHEMATICS CURRICULUM

[rev. 6/1/11]

Unit Overview

Content Area: Mathematics
Unit Number and Title: IV. Geometry
Grade Level: Grade 7

Unit Summary:

- Draw, construct, and describe geometrical figures and describe the relationships among them.
- Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

Primary Interdisciplinary Connections: Social Studies, Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 7.G – Geometry

Standard #	Standard
7.G.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
7.G.2	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
7.G.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
7.G.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
7.G.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
7.G.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Unit Essential Questions:

- How can angles be measured, drawn, and classified?
- What are special shapes and how can they be described and compared?

Unit Enduring Understandings:

- An angle is formed by two intersecting lines or by two different rays with a common endpoint. Angles can be classified by their size.

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- What are the meanings of perimeter and area?
- How can the perimeters and areas of certain shapes be found?
- What is the meaning of volume and how can volume be found?
- What is the meaning of surface area and how can surface area be found?
- How can the volumes of certain figures be found?

- Some pairs of angles have special relationships based on their relative positions or their measures.
- Polygons can be described and classified by their sides and angles. The sum of the angles of a triangle is 180 degrees.
- Polygons can be described and classified by their sides and angles. A quadrilateral can be broken into two triangles so the sum of the measures of the angles of a quadrilateral is 360 degrees.
- A circle is the set of all points in the plane an equal distance from a point, the center.
- The distance around a figure is its perimeter. Formulas exist for finding the perimeters of some polygons and some formulas may be represented in more than one way.
- The amount of space inside a shape is its area, and area can be found using square units. The areas of some irregular shapes can be found by decomposing the shape into polygons for which formulas exist for finding area.
- The formula for the area of a parallelogram is derived from the formula for the area of a rectangle. The formula for the area of a triangle is derived from the formula for the area of a parallelogram.
- The perimeter of a circle is called its circumference, and a formula exists for finding circumference. The ratio of the circumference of any circle to its diameter is a constant value called Pi.
- Formulas for finding the areas of polygons can be used to find the surface areas of some solids.
- Volume is a measure of the amount of space inside a solid figure. Volume can be measured by counting the number of cubic units needed to fill a three-dimensional object.

Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

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Unit Learning Targets:

Students will:

- Identify examples of important geometric terms relating to two-dimensional figures.
- Identify and find the measures of vertical, adjacent, complementary and supplementary angles.
- Identify and classify triangles using sides and angle measures.
- Identify and classify quadrilaterals using the relationships of sides and angle measures.
- Identify parts of a circle, such as center, a radius, a diameter, a chord, a sector, a semicircle, and a central angle, and the relationships among them.
- Identify and make symmetrical figures and draw lines of symmetry.
- Select and use appropriate units, tools, and/or formulas to measure and solve problems involving the perimeters of regular and irregular figures.
- Find the areas of rectangles and irregular figures.
- Develop and use the formulas for the areas of parallelograms and triangles.
- Use the concept of Pi and approximations of it in the formulas to estimate and find circumference, diameter, or radius of a circle when given one of the dimensions.
- Use the dimensions of a circle and π to estimate and find the area of the circle.
- Use objects to solve problems that focus on geometric relationships.
- Find the surface area of a rectangular prism, a triangular prism, a cylinder, and a square pyramid by adding areas of faces or using a formula.
- Find the volume of a rectangular prism by using a formula.
- Find the volume of a triangular prism and of a cylinder by using a formula.
- Use objects and reasoning to find the surface areas and volumes of solid figures.

Unit Vocabulary:

Scale Drawing	Area	Volume	Protractor	Compass
Triangles	Right Triangle	Scalene Triangle	Equilateral	Quadrilateral
Obtuse	Acute	Right Angle	Straight Angle	Rhombus
Square	Rectangle	Trapezoid	Parallelogram	Congruent
Hexagon	Pentagon	Octagon	Degrees	Similar
Parallel	Perpendicular	Pyramid	Prism	Vertical
Complementary	Supplementary	Corresponding	Transversal	Exterior
Diagonal				

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Worksheets
- Open-ended Problems
- Partner work
- Discussion
- Board work
- Oral responses

Suggested Teacher Resources:

Worksheets, books, internet, Study Island, word find

Suggested Summative Assessment Activities:

- Tests
- Project

KITTATINNY REGION
MATHEMATICS CURRICULUM

[rev. 6/1/11]

Unit Overview

Content Area: Mathematics
Unit Number and Title: V. Statistics and Probability
Grade Level: Grade 7

Unit Summary:

- Use random sampling to draw inferences about a population.
- Draw informal comparative inferences about two populations.
- Investigate chance processes and develop, use, and evaluate probability models.

Primary Interdisciplinary Connections: Social Studies, Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy X Health Literacy

Learning Targets

Domain: 7.SP – Statistics and Probability

Standard #	Standard
7.SP.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
7.SP.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. <i>For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.</i>
7.SP.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variability, measuring the difference between the centers by expressing it as a multiple of a measure of variability. <i>For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.</i>
7.SP.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. <i>For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.</i>

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7.SP.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.		
7.SP.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. <i>For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.</i>		
7.SP.7	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.		
7.SP.7.a	Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. <i>For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.</i>		
7.SP.7.b	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. <i>For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?</i>		
7.SP.8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.		
7.SP.8.a	Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs		
7.SP.8.b	Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.		
7.SP.8.c	Design and use a simulation to generate frequencies for compound events. <i>For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?</i>		
<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How can probability be found? • What are different methods for finding the number of possible outcomes of an event? • How do you find all possible outcomes of a compound event by drawing a tree diagram? </td> <td style="width: 50%; vertical-align: top;"> <p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Counting techniques exist for finding the number of possible combinations. The outcomes of an event can be represented pictorially using a tree diagram or an organized list. </td> </tr> </table>		<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How can probability be found? • What are different methods for finding the number of possible outcomes of an event? • How do you find all possible outcomes of a compound event by drawing a tree diagram? 	<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • Counting techniques exist for finding the number of possible combinations. The outcomes of an event can be represented pictorially using a tree diagram or an organized list.
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<ul style="list-style-type: none"> • How do you find all possible outcomes by making a list? • How do you find all possible outcomes by multiplying? • How do you find the number of arrangements of a set of objects when order matters? • How do you find the number of arrangements of a set of objects when order does not matter? • How do you express the probability of an event as a fraction, decimal, or percent? • How do you predict probability to predict results? • How do you predict theoretical and experimental probability? • How do you find the probability of two independent events as a fraction and as a percent? • How do you solve word problems by organized lists? 	<ul style="list-style-type: none"> • There are techniques for counting the number of arrangements of a set of items, both when the order of the items in the arrangement is important and when it is not. • The chance or likelihood of an event occurring, called its probability, can be expressed as a number between 0 and 1 inclusive. • Experiments can be used to estimate the probability of an event occurring and used to make predictions related to that event. • The probability of one outcome occurring followed by the same or another outcome occurring can be calculated if you know the probability of each outcome. • Some problems can be solved by generating a list of outcomes and organizing that list in a systematic way so all outcomes are accounted for.
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Mathematical Practices (1-8): 1, 2, 3, 4, 5, 6, 7, 8

Unit Learning Targets:

Students will:

- Find all possible outcomes of a compound event by drawing a tree diagram, making a list, making a grid, or multiplying.
- Find the number of a set of objects both when order matters and when order does not matter.
- Express the probability of an event as a fraction, decimal, or percent.
- Understand theoretical and experimental probability.
- Use probability to predict results.
- Find the probability of two independent or dependent events as a fraction and a percent.
- Solve word problems by making organized lists.

Unit Vocabulary:

event	tree diagram	theoretical probability	complement
counting principle	permutation	experimental probability	outcome
sample space	combination	dependent events	
compound event	probability	independent events	

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Worksheets
- Open-ended Problems
- Partner work
- Discussion
- Board work
- Oral Responses
- Coin Toss Tabulation

Suggested Teacher Resources:

Worksheets, Books, Internet, Study Island, Word finds

Suggested Summative Assessment Activities:

- Test

KITTATINNY REGION
MATHEMATICS CURRICULUM

[rev. 6/1/11]

Unit Overview

Content Area: Mathematics
Unit Number and Title: I. The Number System
Grade Level: Grade 8

Unit Summary:

- Know that there are numbers that are not rational, and approximate them by rational numbers.

Primary Interdisciplinary Connections: Technology

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 8.NBT – Technology, Science, Social Studies

Standard #	Standard
8.NBT.1	Know that numbers that are not rational are called irrational.
8.NBT.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions. (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.

Unit Essential Questions:

- What is the difference between rational and irrational numbers?
- Can you give examples of rational and irrational numbers?
- Can you approximate the value of $\sqrt{2}$ (which is an irrational number)?
- Can you locate the approximate location of a rational number on a number line in relation to other rational numbers?
- Can you locate the approximate value of $\sqrt{2}$ on a number line by using rational numbers as benchmarks?

Unit Enduring Understandings:

- Numbers that cannot be expressed as a ratio are considered irrational.
- Decimals that repeat (1.66666...), and terminate are rational.
- Decimals that don't repeat and go on infinitely (such as Pi), are considered irrational.
- Square roots can be approximated by repeated guess and check, thereby getting to an approximation that is closer and closer each time.
- Rational and Irrational numbers can be located and ordered on a number line relative to each other.

Mathematical Practices (1-8): 6, 7

Unit Learning Targets:

Students will:

- Be able to determine if a number is rational (can be made into a ratio) or irrational (cannot be made into a ratio)
- Convert a rational number from decimal (terminating) format to a fraction format and vice-versa
- Estimate the value of an irrational number by using repetitive guess and check (example: for the square root of 8, students should be able to know that the value will be between 2 and 3, because 2 squared is 4 and 3 squared is 9, and 8 lies between 4 and 9.)
- Compare, order, and locate rational numbers on a number line.
- Compare, order, and locate irrational numbers (approximate locations) on a number line by using rational numbers as benchmarks.

Unit Vocabulary:

Rational	Irrational	Approximate	Radical	Square Root
Terminating	Repeating			

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Group work
- Partner Work
- Do-Now activities
- Class discussions and Oral Responses
- Board Work
- Work Sheets
- Study Island

Suggested Teacher Resources: Book, videos, transparencies, Internet, study island

Suggested Summative Assessment Activities:

- Tests
- Projects

KITTATINNY REGION
MATHEMATICS CURRICULUM

[rev. 6/1/11]

Unit Overview

Content Area: Mathematics

Unit Number and Title: II. Expressions and Equations, Part 1 of 2

Grade Level: Grade 8

Unit Summary:

- Work with radicals and integer exponents.
- Understand the connections between proportional relationships, lines, and linear equations

Primary Interdisciplinary Connections: Technology, Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 Civic Literacy Health Literacy

Learning Targets

Domain: 8.EE – Expressions and Equations, Part 1 of 2

Standard #	Standard
8.EE.1	1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$
8.EE.2	2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational
8.EE.3	3. Use numbers expressed in the form of a single digit times a whole-number power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other
8.EE.4	4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
8.EE.5	5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.
8.EE.6	6. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.

Unit Essential Questions:

- How can you multiply and divide expressions with Scientific Notation?
- How can you solve an equation containing a variable that is squared or a variable that is cubed?

Unit Enduring Understandings:

- Exponent expressions can vary in form but may be shown to be equivalent by using exponent properties.

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- How can you use the properties of exponents to show that $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$?
- How are similar triangles and slope related in the graph of a linear equation (for a non-vertical or non-horizontal line)?
- Why does the unit rate show up as the slope on a graph of a linear equation?
- Can you graph a proportional relationship using the unit rate as the slope of the graph?

- Negative Exponents, such as seen in Scientific notation, indicate division not multiplication.
- Solve equations with squares and cubes by using square roots and cube roots.
- Work comfortably with Scientific notation, understanding that it is used to describe very small or very large quantities.
- Perform operations (such as multiplication and division) with Scientific notation.
- Compare 2 proportional relationships represented in different ways.
- Note that slope and similar triangles are related.
- Proportional relationships can be graphed by using the unit rate as the slope on the graph.

Mathematical Practices (1-8): 1, 2, 3, 4, 8

Unit Learning Targets:

Students will:

- Know and apply the properties of exponents
- Use square root and cube root symbols to solve equations containing variables with squares and cubes
- Use scientific notation to describe very large or very small numbers
- Use operations (multiplication and division) with scientific notation
- Use similar triangles to explain why the slope, m is the same between any two distinct points on a non-vertical line in the coordinate plane
- Graph proportional relationships, using the unit rate as the slope

Unit Vocabulary:

Exponent	square	cube	square root	cube root
Scientific Notation	coefficient	proportional	similar Triangles	slope
Origin	y-intercept	unit rate		

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Group work
- Partner Work
- Do-Now activities
- Class discussions and Oral Responses
- Board Work
- Work Sheets
- Study Island
- Geo Board Activities

Suggested Teacher Resources:

Book, videos, transparencies, Internet, study island, Smart Boards, Geo Boards for showing slope

Suggested Summative Assessment Activities:

- Tests
- Projects

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- What does the intersection of two lines on a coordinate plane represent?
- What does the non-intersection (parallel lines) on a coordinate plane represent?
- What if one form of a line overlaps another line? (It is the same line, and there are infinite solutions).
- Can you solve a real world problem by using algebra (equations and graphing)?
- Does the line through point A and B intersect the line through points C and D? (do the lines through the points have the same or a different slopes?)

- The solution to a system of two linear equations in two variables corresponds to the point(s) of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
- systems of equations can be solved using algebra or they can be estimated by looking at the graphs of the equations on a coordinate plane (by using inspection)
- If two lines intersect, there is one solution. If two lines do not intersect, there is no solution. If two lines overlap over one another, there are infinite solutions.
- Real world situations can be modeled using algebra (equations and graphing).

Mathematical Practices (1-8): 1, 2, 3, 4, 7, 8

Unit Learning Targets:

Students will:

- Solve and identify equations that have one, infinite, or no solutions, both algebraically and by using graphs
- Solve equations involving the distributive property and combining like terms.
- Solve real world problems involving systems of equations
- Determine if lines intersect or not (by finding slopes between the points)
- Analyze and solve pairs of simultaneous linear equations
- Show that the point of intersection of a pair of simultaneous equations will satisfy both equations because it lies on both lines.

Unit Vocabulary:

Linear Equation	Variable	Solution	Satisfy
Infinite Solutions	Distributive Property	Combining Like Terms	Coordinates
Simultaneous Equations	No solution	Systems of Equations	Point of Intersection

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Group work
- Partner Work
- Do-Now activities
- Class discussions and Oral Responses
- Board Work
- Work Sheets
- Study Island

Suggested Teacher Resources: Book, videos, transparencies, Internet, study island

Suggested Summative Assessment Activities:

- Tests
- Projects

KITTATINNY REGION
MATHEMATICS CURRICULUM

[rev. 6/1/11]

Unit Overview

Content Area: Mathematics
Unit Number and Title: IV. Functions
Grade Level: Grade 8

Unit Summary:

- Define, evaluate, and compare functions.
- Use functions to model relationships between quantities

Primary Interdisciplinary Connections: Technology, Science

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy Health Literacy

Learning Targets

Domain: 8.F – Functions

Standard #	Standard
8.F.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
8.F.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.
8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
8.F.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Unit Essential Questions:

- How many outputs does each input have for a function?
- How are the input and output of a function represented on a graph?
- How does rate of change show up on-- a table, a

Unit Enduring Understandings:

- Each input has one and only one output (each x value gets only one y value)
- The input and output of a function are coordinates that can be graphed on a coordinate plane.
- For a linear function, rate of change(slope),

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<p>graph, and an equation--of a function?</p> <ul style="list-style-type: none"> • What does the graph of a linear equation look like on a coordinate grid? • How is the initial value of a linear function represented in the equation, graph, and table? What does the initial value mean in terms of the situation it is presented in? • How is the rate of change of a linear function represented on an equation, graph, and table? What does rate of change mean in terms of the situation being presented? • Can you determine (and compare) the rate of change (slope), from a graph, equation, or table of 2 different situations presented in 2 different forms (ex. one function represented as a graph, one represented as a table)? • What does an increasing rate of change, a decreasing rate of change, or no rate of change look like on a graph? • Can you create a graph based on verbal descriptions or a story of an event? 	<p>shows up as 1st difference on a table, as the coefficient of the x value on an equation, and the rise/run between any 2 points on a graph.</p> <ul style="list-style-type: none"> • A linear function forms a straight line on a coordinate grid. • The initial value of a linear function is represented as the y-intercept on a graph, as the y-value(output) of an x-value(input) of zero, and the “b” in a slope-intercept form of an equation ($y = mx + b$). • The rate of change of a linear function is represented as the “steepness” of a graph, as the coefficient of the x-value in the slope-intercept form of an equation, and as first difference in a table (where it is constant). • A flat graph shows no rate of change, a line that ramps up shows increasing rate of change, and a line that ramps down shows a decreasing (or negative) rate of change.
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Mathematical Practices (1-8): 1, 2, 3, 4, 8

Unit Learning Targets:

Students will:

- Graph a linear function by creating a table of values (inputs/outputs), and by using the slope-intercept form of an equation, $y = mx + b$ format.
- Determine and compare rates of change (slope) of functions represented in various forms (tables, equations, graphically, or verbal descriptions)
- Give examples of (and recognize) non-linear functions using tables, equations, and graphical representations.
- Construct a function model (write an equation, model relationships), based on a series of numbers (table) or graph.
- Sketch a graph that has been described verbally.
- Describe qualitatively between two quantities by analyzing a graph (where it is increasing, decreasing, linear or non-linear).

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Unit Vocabulary:

Function	input	output	initial value	y-intercept
rate of change	Slope	Equation	graph	table
1 st difference	2 nd difference	model	ordered pair	linear
nonlinear	increasing	decreasing	constant	coefficient

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Group work
- Partner Work
- Do-now activities
- Class discussions and Oral Responses
- Board Work
- Work Sheets
- Study Island

Suggested Teacher Resources: Book, videos, transparencies, internet, study island

Suggested Summative Assessment Activities:

- Tests
- Projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: V. Geometry, Part 1 of 2
Grade Level: Grade 8

Unit Summary:

- Understand congruence and similarity using physical models, transparencies, or geometry software

Primary Interdisciplinary Connections: Technology, Science, Social Studies

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy Health Literacy

Learning Targets

Domain: 8.G – Geometry, Part 1 of 2

Standard #	Standard
8.G.1.a	Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length.
8.G.1.b	b. Angles are taken to angles of the same measure.
8.G.1.c	c. Parallel lines are taken to parallel lines.
8.G.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
8.G.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
8.G.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.

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Unit Essential Questions:

- How will lines, parallel lines, line segments and angles appear after translations, rotations, and reflections?
- What effect will rotating, reflecting, or translating have on the congruency of a 2-dimensional figure?
- Using translations, rotations, and reflections, can you describe a sequence that transforms an original figure to another figure congruent to the original?
- What effect will rotations, reflections, dilations, and translations have on the coordinates of a figure?
- What effect will rotating, reflecting, translating, and dilating have on the similarity of a 2-dimensional figure?
- Using translations, rotations, reflections, and dilations, can you describe a sequence that transforms an original figure to another figure similar to the original?
- Can you describe the relationships of the angles created when parallel lines are cut by a transversal?

Unit Enduring Understandings:

- Lines, Parallel lines, line segments, and angles will be exactly the same if rotated, reflected, or rotated.
- Rotating, reflecting, and translating will have no effect on the congruency of a 2-dimensional figure.
- Given 2 congruent figures, there is a sequence that can be used to transform one to the other by using translations, rotations, and reflections.
- Transforming a figure using translations, rotations, dilations, or reflections will have different effects on the coordinates of a 2-dimensional shape.
- Given 2 similar figures, there is a sequence that can be used to transform one to the other by using translations, rotations, reflections, and dilations.
- Rotating, reflecting, translating, and dilating will produce a figure that is similar to the original figure.
- If 2 triangles have all corresponding angles congruent, then the 2 triangles are similar.

Mathematical Practices (1-8): 1, 2, 4, 5, 7, 8

Unit Learning Targets:

Students will:

- Verify experimentally the properties of rotations, reflections, and translations.
- Understand that objects/2-d shapes will be congruent after rotations, reflections, and translations.
- Link 2 congruent figures by a series of rotations, reflections, and translations.
- Understand that rotating, reflecting, translating, and dilating shapes and 2-d objects will produce a figure that is similar to the original figure.
- Link 2 similar figures by a series of rotations, reflections, translations, and dilations.
- Understand that parallel lines cut by a transversal will form angles that have consistent relationships between them.
- Understand that triangles have 3 interior angles whose sum is always 180 degrees.
- Understand that triangles having 3 congruent angles are similar.

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Unit Vocabulary:

congruent	similar	translation	transformation
reflection	rotation	interior angles	exterior angles
supplementary	complementary	obtuse	acute
transversal	parallel lines	dilation	

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Group work
- Partner Work
- Do Now Activities
- Class discussions and Oral Responses
- Board Work
- Work Sheets
- Study Island

Suggested Teacher Resources: Book, videos, transparencies, internet, study island

Suggested Summative Assessment Activities:

- Tests
- Projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: Unit VI. Geometry, Part 2 of 2
Grade Level: Grade 8

Unit Summary:

- Understand and apply the Pythagorean Theorem
- Solve real-world and mathematical problems involving volumes of cylinders, cones, and spheres

Primary Interdisciplinary Connections: Technology

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy Health Literacy

Learning Targets

Domain: 8.G – Geometry, Part 2 of 2

Standard #	Standard
8.G.6	Explain a proof of the Pythagorean Theorem and its converse
8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
8.G.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Unit Essential Questions:

- What formula can be used to find the distance between any 2 points on the coordinate plane? (points connected vertically or horizontally will not need this formula)
- Using a rectangular prism, find the distance from a vertex to the opposite vertex.
- What are the formulas for the volumes of cones, cylinders, and spheres?
- What is the volume relationship between cones and cylinders of the same dimensions?

Unit Enduring Understandings:

- The Pythagorean Theorem can be used to find distance between 2 points in a coordinate plane. It can also be used to find the length of a leg or hypotenuse of a right triangle.
- Pythagorean Theorem can be used to calculate distances from vertex to opposite vertex in a rectangular prism.
- Formulas for spheres, cylinders, and cones can be used to solve real world and mathematical problems.
- Cones and Cylinders of the same dimensions have a 1 to 3 relationship in volume. Cones are 1/3 the volume of cylinders with the same dimensions.

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Mathematical Practices (1-8): 4, 5, 6, 7

Unit Learning Targets:

Students will:

- Be able to use the Pythagorean Theorem and recognize that it can be used in right triangles and on the coordinate plane.
- Apply the Pythagorean Theorem to calculate the distance/measure of a hypotenuse.
- Apply the Pythagorean Theorem to calculate/determine the unknown side-length(s) of a right-triangle.
- Use the Pythagorean Theorem to find the distance between 2 points on a coordinate plane.
- Solve Real world problems involving volumes of spheres, cylinders, cones.
- Understand the relationship between cylinders and cones (a cone is $\frac{1}{3}$ the volume of a cylinder with the same dimensions).

Unit Vocabulary:

volume	right-angle	Pythagorean Theorem	leg
cone	cylinder	vertex	sphere
hypotenuse	coordinate system	formula	solid

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Group work
- Partner Work
- Do Now Activities
- Class discussions and Oral Responses
- Board Work
- Work Sheets
- Study Island

Suggested Teacher Resources: Book, videos, transparencies, internet, study island

Suggested Summative Assessment Activities:

- Tests
- Projects

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Unit Overview

Content Area: Mathematics
Unit Number and Title: VII. Statistics and Probability
Grade Level: Grade 8

Unit Summary:

- Investigate patterns of association in bivariate data.

Primary Interdisciplinary Connections: Technology, Science, Social Studies

21st Century Themes:

 X Global Awareness X Financial, economic, business, and entrepreneurial literacy
 X Civic Literacy Health Literacy

Learning Targets

Domain: 8.SP – Statistics and Probability

Standard #	Standard
8.SP.1	1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
8.SP.2	2. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
8.SP.3	3. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.
8.SP.4	4. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?

Unit Essential Questions:

- Can you construct and interpret scatter plots for bivariate data to investigate patterns of association between 2 quantities?

Unit Enduring Understandings:

- Scatter plots can be used to see relationships between 2 types of quantities.

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- Can you fit a straight line on your scatter plot, or determine that you cannot fit a straight line to the data (non-linear relationship)?
- Does the relationship shown on your scatter plot demonstrate linear association (correlation), nonlinear association, positive or negative association?
- Can you interpret the significance of slope and y-intercept from a linear equation modeling a real world situation?
- Can you notice a pattern between 2 categorical variables when presented with information in a two-way table?
- Can you use relative frequencies calculated for rows and columns to describe possible association between the 2 variables?

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- Straight lines are widely used to model linear relationships between 2 quantitative variables.
- Straight lines can be modeled with equations that can be used to solve problems involving 2 quantitative variables.
- The slope of the line is the rate of change of the relationship (y/x).
- The y-intercept (where the graph crosses the y-axis) represents the initial conditions of the relationship (known as “b” in the slope-intercept form of the equation).
- Models of relationships (equations fitting data points) can be judged by the closeness of the fit between the data points and the line that models the relationship.
- Patterns of association can be seen in categorical data by displaying frequencies and relative frequencies in a two-way table.
- Two way tables can be constructed and interpreted to see patterns of association between 2 categorical variables.

Mathematical Practices (1-8): 1, 2, 3, 4, 7, 8

Unit Learning Targets:

Students will:

- Construct and interpret scatter plots for bivariate measurement data
- Investigate patterns of association between two quantities
- Describe patterns such as clustering, outliers, positive and negative associations, linear associations, and nonlinear associations between 2 quantities
- Fit lines to model relationships between 2 quantitative variables.
- Judge the model (equation in the form of a line) based on the closeness of the data points to the line that was fit to the data
- Use equations that model real world situations to solve problems
- Interpret and understand the meaning of the slope and y intercept of an equation modeling real world situations
- Be able to construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects

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- Use relative frequencies calculated for rows or columns to describe possible association between 2 variables.

Unit Vocabulary:

Scatter-plot	clustering	outliers	positive association
negative association	linear association	slope	intercept
nonlinear association	linear model	bivariate	frequency
relative-frequency	two-way table		

Evidence of Learning

Suggested Formative Assessment Activities:

- Quizzes
- Group work
- Partner Work
- Do-Now Activities
- Class discussions and Oral Responses
- Board Work
- Work Sheets
- Study Island

Suggested Teacher Resources: Book, videos, transparencies, internet, study island

Suggested Summative Assessment Activities:

- Tests
- Projects

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