

NEW MILFORD PUBLIC SCHOOLS
New Milford, Connecticut



Grade Three Mathematics

September 2014

*Approved by the Board of Education
September 9, 2014*

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New Milford's Mission Statement

The mission of the New Milford Public Schools, a collaborative partnership of students, educators, family and community, is to prepare each and every student to compete and excel in an ever-changing world, embrace challenges with vigor, respect and appreciate the worth of every human being, and contribute to society by providing effective instruction and dynamic curriculum, offering a wide range of valuable experiences, and inspiring students to pursue their dreams and aspirations.

Pacing Guide

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Key for Standards

- MP 1 - Make sense of problems and persevere in solving them
- MP 2 - Reason abstractly and quantitatively
- MP 3 - Construct viable arguments and critique the reasoning of others
- MP 4 - Model with mathematics
- MP 5 - Use appropriate tools strategically
- MP 6 - Attend to precision
- MP 7 - Look for and make use of structure
- MP 8 - Look for and express regularity in repeated reasoning.

New Milford Public Schools

Committee Member(s): Corby Kennison, Megan Lago, Catherine Wilson Jim Winter, Stephanie Zappone Unit Title: Unit 1	Course/Subject: Mathematics Grade Level: 3 # of Weeks: 4
Identify Desired Results	
Common Core Standards	
Standards in Unit <ul style="list-style-type: none"> • (3.OA.8) Solve problems involving the four operations, and identify and explain patterns in arithmetic. Solve two-step word 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) Solve problems involving the four operations, and identify and explain patterns in arithmetic. 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. • (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. Standards Only in Classroom Routines/Ten-Minute Math <ul style="list-style-type: none"> • (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. • (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. 	
Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that ...)	Essential Questions Inquiry used to explore generalizations
<ul style="list-style-type: none"> • More than one step or operation may be needed to solve a problem. Thinking about our answers and their reasonableness helps us determine if our solution <i>could</i> be correct. • Looking for patterns in the basic addition and multiplication facts helps you learn the facts. 	<ul style="list-style-type: none"> • What strategies can we use to solve problems? Is your answer reasonable? • How can finding patterns help you learn basic facts? How can seeing patterns help you with knowing when an answer is reasonable? • What strategies can be used to find sums and differences? How do the numbers in a problem determine

<ul style="list-style-type: none"> • Addition and subtraction problems can be solved with a variety of strategies. Understanding place value can lead to number sense and efficient strategies for computing with numbers. 	<p>how I add or subtract them?</p>
Expected Performances What students should know and be able to do	
<p>Students will know the following:</p> <ul style="list-style-type: none"> • Students solve addition problems with two and small three-digit numbers, solve subtraction problems involving two-digit numbers, find combinations of numbers that add to 100, and work with coins and coin values. • Understanding of place value develops as they add and subtract 10s to and from three-digit numbers, break three-digit numbers into hundreds, tens, and ones in different ways, and solve story problems involving hundreds, tens, and ones. <p>Students will be able to do the following:</p> <ul style="list-style-type: none"> • Demonstrate fluency with the addition combinations up to 10+10. • Add multiples of 10 (up to 100) to and subtract them from 2- and small 3-digit numbers. • Solve addition problems with 2-digit numbers using strategies that involve breaking numbers apart by place or adding one number in parts. • Break up 3-digit numbers (less than 200) into 100s, 10s, and 1s in different ways (e.g., 153 equals 1 hundred, 5 tens, and 3 ones; 15 tens and 3 ones; 14 tens and 13 ones, etc.). • Find combinations of 2-digit numbers that add to 100 or \$1.00. 	
Character Attributes	
<ul style="list-style-type: none"> • Cooperation • Respect • Responsibility • Perseverance 	
Technology Competencies	
<ul style="list-style-type: none"> • None 	
Develop Teaching and Learning Plan	
<p>Teaching Strategies:</p> <p>Use a math workshop model with teacher-directed mini-lesson</p> <ul style="list-style-type: none"> • to provide students with repeated experiences with concepts and skills <p>to provide time for teachers to work with small groups of students</p> <p>Use games to develop concepts and practice skills</p>	<p>Learning Activities:</p> <ul style="list-style-type: none"> • Understand, recognize, and represent place value using tools such as stickers, 100 chart, and a number line • Explore strategies for adding and subtracting multiples of 10 <ul style="list-style-type: none"> - Discuss, explain, and compare strategies, such as adding by place, adding one number in parts, and using a number line

<p>Use student-centered activities and worthwhile math tasks</p> <p>Use a variety of grouping structures</p> <ul style="list-style-type: none"> • Collaborative groups, partners, individuals <p>Orchestrate class discussions</p> <ul style="list-style-type: none"> • Focus discussions on important mathematics and student strategies • Elicit participation by all students over the course of several discussions • Facilitate student to student discourse <p>Encourage students to represent and discuss their thinking strategies</p> <p>Use Classroom Routines/Ten-Minute Math to provide on-going practice and review</p> <ul style="list-style-type: none"> • Classroom Routines: <ul style="list-style-type: none"> • What's the Temperature <ul style="list-style-type: none"> • Reading a thermometer, learning to associate different temperatures with words, and establishing landmark temperatures. • Reading information in a table, on a graph, and interpreting the meaning of the shape of a graph. • Ten-Minute Math: <ul style="list-style-type: none"> • More or Less? <ul style="list-style-type: none"> • Breaking apart, reordering, or combining numbers within a problem for easier computation. • Using knowledge of place value and known combinations to estimate sums and differences. • Practicing Place Value <ul style="list-style-type: none"> • Recognizing and interpreting the value of each digit in two-and three-digit numbers. • Finding different combinations of a number, using only 100s, 10s, and 1s, and recognizing their equivalence. • Reading and writing numbers up to 1,000. 	<p>using story problems to determine which is the most efficient</p> <ul style="list-style-type: none"> - Play game: Capture 5 <ul style="list-style-type: none"> • Develop and represent strategies to reach 100 using an unmarked number line <ul style="list-style-type: none"> - How Many More to 100 - How Many More to \$1.00 • Recognize and demonstrate equivalencies among 100, ten 10s, and ten 1s using pennies, dimes, and dollars <ul style="list-style-type: none"> - Play game: Collect \$2.00 • Solve problems with 2 digit numbers by using strategies such as breaking numbers apart, and adding one number in parts • Explore strategies to fluently solve addition combination through 10+10 (ie: make 10, doubles, near doubles, plus 10, and plus 9) • Discuss, explore, and explain strategies for making combinations equal to 100 or \$1.00 <ul style="list-style-type: none"> - Solve story problems - Play game: Close to 100 - Play game: Close to \$1.00 • Explore and compare combinations of 100s, 10s, and 1s for a number and recognize their equivalence <ul style="list-style-type: none"> - Hundreds, Tens, and Ones Problems
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Assessments	
Performance Task(s)	Other Evidence
Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Application that is functional in a classroom context to evaluate student achievement of desired results
<p>Goal:</p> <p>Role:</p> <p>Audience:</p> <p>Situation:</p> <p>Product or Performance:</p> <p>Standards for Success:</p>	<p>Ongoing Formative Assessments:</p> <p>Observing Students</p> <ul style="list-style-type: none"> • Solve problems adding and subtracting multiples of 10 from a 2 digit number • Use efficient strategies to solve addition and subtraction problems with 2 digit numbers • Write equations to represent addition and subtraction strategies • Demonstrate multiple combinations of 100s, 10s, and 1s to represent a number • Use known combinations to fluently solve unknown combinations to 10+10 <p>Other Formative Assessments</p> <ul style="list-style-type: none"> • Addition Combinations • Fluently solve addition combinations to 10+10 • Adding and Subtracting 10s <ul style="list-style-type: none"> - Efficiently add and subtract multiples of 10 • Hundreds, Tens, and Ones <ul style="list-style-type: none"> - Represent a two digit number as different combinations of tens and ones <p>End of Unit Assessment</p> <ul style="list-style-type: none"> • Solve a story problem with 2 digit numbers. Write an equation. Show thinking. • Find combinations of 2 digit numbers equal to 100. Explain thinking. • Break up numbers into 100s, 10s, and 1s in different ways. Write an equation.

Suggested Resources

- [Howard County Math Wiki](#), Grade 3. June 23, 2014.
- [K-5 Math Teaching Resources](http://www.k-5mathteachingresources.com/), K-5 Math Teaching Resources, LLC. <http://www.k-5mathteachingresources.com/> . May 9, 2014.
- Russell, Susan Jo and Karen Economopoulos. (Second Edition, 2012) *Investigations in Number, Data, and Space, Grade 3: Unit 1*, Trading Stickers, Combining Coins. Upper Saddle River, NJ: Pearson.
- Van de Walle, John, et al. *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 3-5*, Second Edition. Boston: Pearson, 2014.

New Milford Public Schools

Committee Member(s): Corby Kennison, Megan Lago, Catherine Wilson Jim Winter, Stephanie Zappone Unit Title: Unit 2	Course/Subject: Mathematics Grade Level: 3 # of Weeks: 4
Identify Desired Results	
Common Core Standards	
Standards in Unit <ul style="list-style-type: none"> (3.MD.3) Represent and interpret data. 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. (Standard also found in Classroom Routines) (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. 	
Standards Only in Classroom Routines/Ten-Minute Math <ul style="list-style-type: none"> (3.NF.1) Understand 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.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.OA.8) Solve problems involving the four operations, and identify and explain patterns in arithmetic. Solve two-step word 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. 	
Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that ...)	Essential Questions Inquiry used to explore generalizations
<ul style="list-style-type: none"> Measurement processes are used in everyday life to describe and quantify the world. Data can be organized, represented, and interpreted in multiple ways for a variety of purposes. Measurement processes are used in everyday life to describe and quantify the world. Data displays describe and represent data in 	<ul style="list-style-type: none"> How and why do we organize information? Why display data in different ways? Why does "what" we measure influence "how" we measure? Why display data in different ways?

<p>alternative ways. Larger units can be subdivided into equivalent units.</p>	
<p>Expected Performances What students should know and be able to do</p>	
<p>Students will know the following:</p> <ul style="list-style-type: none"> • Students collect, represent, describe, categorize, and interpret both categorical and numerical data. They begin the important work of seeing a data set as a whole as they design and carry out their own data investigations, create representations of the data collected, and compare and discuss these representations. • Students draw conclusions about the data by identifying characteristics in their representations. (Where is most of the data clumped? Where is the mode?) • Students' collection of numerical data includes measuring length in inches and feet. • Students review the basic units of inches, feet, and yards and their relationships (e.g., one foot is equivalent to 12 inches, one yard is equivalent to 3 feet or 36 inches) by measuring lengths longer than one foot <p>Students will be able to do the following:</p> <ul style="list-style-type: none"> • Organize, represent, and describe categorical data, choosing categories that help make sense of the data. • Interpret a bar graph. • Make a line plot for a set of numerical data. • Describe the shape of the data for a numerical data set, including where data are concentrated, where there are few data, what the lowest and highest values are, what the mode is, and where there is an outlier. • Summarize a set of data, describing concentrations of data and what those concentrations mean in terms of the situation the data represent. 	
<p>Character Attributes</p>	
<ul style="list-style-type: none"> • Cooperation • Respect • Responsibility • Perseverance 	
<p>Technology Competencies</p>	
<ul style="list-style-type: none"> • None 	
<p>Develop Teaching and Learning Plan</p>	
<p>Teaching Strategies: Use a math workshop model with teacher-directed mini-lesson</p> <ul style="list-style-type: none"> • to provide students with repeated experiences with concepts and skills • to provide time for teachers to work with small groups of students 	<p>Learning Activities:</p> <ul style="list-style-type: none"> • Gather data on topics such as (places we like) • Classify and organize data in different ways • Use data to write and answer questions • Represent, describe, and interpret

Use games to develop concepts and practice skills

Use student-centered activities and worthwhile math tasks

Use a variety of grouping structures

- Collaborative groups, partners, individuals

Orchestrate class discussions

- Focus discussions on important mathematics and student strategies
- Elicit participation by all students over the course of several discussions
- Facilitate student to student discourse

Encourage students to represent and discuss their thinking strategies

Use Classroom Routines/Ten-Minute Math to provide on-going practice and review

- Classroom Routines:
 - What's the Temperature?
 - Reading a thermometer, learning to associate different temperatures with words, and establishing landmark temperatures.
 - Reading information in a table, on a graph, and interpreting the meaning of the shape of a graph.
- Ten-Minute Math:
 - Guess My Rule
 - Using evidence and formulating questions to make hypotheses about the common characteristics of groups of people or things.
 - Systematically eliminating possibilities.
 - Using mathematical terms to describe numbers.
 - Using fractions to describe the group.
 - More or Less?
 - Breaking apart, reordering, or combining numbers within a problem for easier computation.
 - Using knowledge of place value and known combinations to

data using a picture or graph

- Read and compare data on a bar graph with scale intervals larger than one using vocabulary such as: almost, all, very few, half, more than half, about half
- Use a line plot to represent data.
- Describe and interpret data using relevant vocabulary such as: mode, range, median, outlier
- Develop and revise a survey question.
- Collect, compare, and interpret data using a line plot
- Present collected data
- Understand and discuss relationships between feet and inches
- Accurately measure in feet and inches using a ruler to measure lengths longer than a foot
 - Measure the Classroom
 - How Far Can a Third Grader Jump?

<ul style="list-style-type: none"> estimate sums and differences. • Today's Number <ul style="list-style-type: none"> • Generating equivalent expressions for a number using particular constraints. • Practicing computation skills. • Using notation to record expressions. 	
Assessments	
<p style="text-align: center;">Performance Task(s)</p> <p>Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)</p>	<p style="text-align: center;">Other Evidence</p> <p>Application that is functional in a classroom context to evaluate student achievement of desired results</p>
<p>Goal:</p> <p>Role:</p> <p>Audience:</p> <p>Situation:</p> <p>Product or Performance:</p> <p>Standards for Success:</p>	<p>Ongoing Formative Assessments:</p> <p>Observing Students</p> <ul style="list-style-type: none"> • Interpret data on a bar graph to compare groups • Summarize and describe data sets using the phrases: almost all, more than half, very few, about half • Construct a line plot • Describe data on a line plot noting what is typical <p>Other Formative Assessments</p> <ul style="list-style-type: none"> • Interpreting Bar Graphs: Read a bar graph to compare groups. • How Many People Live in Your Home? Interpret and compare data from a line plot. <p>End of Unit Assessment</p> <ul style="list-style-type: none"> • Use a line plot to describe and summarize data • Organize and represent data in sensible categories • Describe this data

Suggested Resources

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- [K-5 Math Teaching Resources](http://www.k-5mathteachingresources.com/), K-5 Math Teaching Resources, LLC. <http://www.k-5mathteachingresources.com/> . May 9, 2014.
- Russell, Susan Jo and Karen Economopoulos. (Second Edition, 2012) *Investigations in Number, Data, and Space, Grade 3: Unit 2, Surveys and Line Plots*. Upper Saddle River, NJ: Pearson.
- Van de Walle, John, et al. *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 3-5*, Second Edition. Boston: Pearson, 2014.

New Milford Public Schools

Committee Member(s): Corby Kennison, Megan Lago, Catherine Wilson Jim Winter, Stephanie Zappone Unit 3	Course/Subject: Mathematics Grade Level: 3 # of Weeks: 5
Identify Desired Results	
Common Core Standards	
Standards in Unit <ul style="list-style-type: none"> • (3.OA.8) Solve problems involving the four operations, and identify and explain patterns in arithmetic. Solve two-step word 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. (Standard also in Ten-Minute Math) • (3.OA.9) Solve problems involving the four operations, and identify and explain patterns in arithmetic. 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. • (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.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. (Standard also in Ten-Minute Math) 	
Standards Only in Classroom Routines/Ten-Minute Math <ul style="list-style-type: none"> • (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.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. 	
Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that ...)	Essential Questions Inquiry used to explore generalizations
<ul style="list-style-type: none"> • More than one step or operation may be needed to solve a problem. Thinking about our answers and their reasonableness helps us determine if our solution <i>could</i> be correct. 	<ul style="list-style-type: none"> • What strategies can we use to solve problems? • Is your answer reasonable? • How can finding patterns help you learn basic facts? • How can seeing patterns help you

<ul style="list-style-type: none"> • Looking for patterns in the basic addition and multiplication facts helps you learn the facts. • Measurement processes are used in everyday life to describe and quantify the world. • Time can be expressed using different units that are related to each other. 	<p>with knowing when an answer is reasonable?</p> <ul style="list-style-type: none"> • What strategies can be used to find sums and differences? • How do the numbers in a problem determine how I add or subtract them? • How do we measure time? • How do we use time to solve problems?
Expected Performances What students should know and be able to do	
<p>Students will know the following:</p> <ul style="list-style-type: none"> • Students practice and refine their strategies for solving addition problems with three-digit numbers to 400 and subtraction problems with two- and three-digit numbers to 300. • Students expand their understanding of subtraction as they solve comparison problems and problems in which they find the missing part of a whole. • Students increase their understanding of place-value as they extend their work into three-digit numbers up to 1,000 and study the structure of 1,000. <p>Students will be able to do the following:</p> <ul style="list-style-type: none"> • Read, write, and sequence numbers up to 1,000. • Identify the value of each digit in a 3-digit number (100s, 10s, and 1s). • Identify how many groups of 10 are in a 3-digit numbers (e.g., 153 had 15 groups of 10 plus 3 ones). • Solve addition problems with 3-digit numbers (up to 400) by using strategies that involve breaking numbers apart, either by place value or by adding one number in parts. • Solve subtraction story problems in contexts that include removing a part from a whole, comparing 2 quantities, or finding the missing part. • Solve subtraction problems with 2- and 3-digit numbers (up to 300) by using strategies that involve subtracting one number in parts, adding up, or subtracting back. 	
Character Attributes	
<ul style="list-style-type: none"> • Cooperation • Respect • Responsibility • Perseverance 	
Technology Competencies	
<ul style="list-style-type: none"> • None 	

Develop Teaching and Learning Plan

Teaching Strategies:

Use a math workshop model with teacher-directed mini-lesson

- to provide students with repeated experiences with concepts and skills
- to provide time for teachers to work with small groups of students

Use games to develop concepts and practice skills

Use student-centered activities and worthwhile math tasks

Use a variety of grouping structures

- Collaborative groups, partners, individuals

Orchestrate class discussions

- Focus discussions on important mathematics and student strategies
- Elicit participation by all students over the course of several discussions
- Facilitate student to student discourse

Encourage students to represent and discuss their thinking strategies

Use Classroom Routines/Ten-Minute Math to provide on-going practice and review

- Classroom Routines:
 - Class Collection
 - Solving addition problems with two- and three- digit numbers.
 - Finding the difference between two-, three- digit numbers and 1,000.
 - What's the Temperature
 - Reading a thermometer, learning to associate different temperatures with words, and establishing landmark temperatures.
 - Reading information in a table, on a graph, and interpreting the meaning of the shape of a graph.
 - Today's Number
 - Generating equivalent expressions for a number using

Learning Activities:

- Read, write, and sequence numbers to 1,000 using place value in the context of stickers and collection cards
- Estimate and discuss strategies for finding sums to 1,000 using place value and known combinations.
 - Play game Go Collecting
 - How Many Tens?
 - How Many Hundreds?
 - Play game: Close to 100
- Recognize, represent, and discuss the number of tens in a three digit number
 - Class Collection
- Explore strategies to find the difference between three digit numbers
- Explore, represent, and explain strategies for solving addition problems with two and three digit numbers to 400 (ie: breaking apart numbers and recombining, starting with one number and adding in parts, changing numbers to create easier problems)
 - Collecting Stickers
 - Combining Collections
 - Collecting Story Problems
 - Collections Match
- Develop strategies to add and subtract multiples of ten and one hundred
 - Play game: Capture on 300 Chart
- Explore efficient strategies to fluently subtract from 20 or less (ie: using known addition combinations)
- Develop, discuss, and explain strategies to find the difference between 2 and 3 digit numbers under 200 (ie: using 100 as a landmark)
 - Distance Riddle
 - Play game: How Far From 100?
- Determine strategies for solving subtraction problems with a missing part (ie: visualize and represent the action, use 100 as a landmark)
 - Travel Problems
 - How Far From 100?

<p>particular constraints.</p> <ul style="list-style-type: none"> • Practicing computation skills. • Using notation to record expressions. • What Time is It? <ul style="list-style-type: none"> • Naming, notating, and telling time to the nearest 5 minutes on a digital or analog clock. • Telling time to any minute on a digital or analog clock • Determining intervals of time to the minute. 	<ul style="list-style-type: none"> - Distance Riddles • Represent, explain, share, and compare strategies to solve comparison story problems with 2 and 3 digit numbers up to 300 <ul style="list-style-type: none"> - How Many Are Left?
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Assessments

<p style="text-align: center;">Performance Task(s)</p> <p>Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)</p>	<p style="text-align: center;">Other Evidence</p> <p>Application that is functional in a classroom context to evaluate student achievement of desired results</p>
<p>Goal:</p> <p>Role:</p> <p>Audience:</p> <p>Situation:</p> <p>Product or Performance:</p> <p>Standards for Success:</p>	<p>Ongoing Formative Assessments:</p> <p>Observing Students</p> <ul style="list-style-type: none"> • Use knowledge of place value to locate numbers of 1,000 chart • Sequence 2 and 3 digit numbers • Use tools such as 1,000 chart and stickers to determine the number of 10s in three digit numbers • Use effective strategies to solve addition problems with 2 and 3 digit numbers • Use strategies to solve missing part subtraction problems • Use strategies to solve comparison story problems <p>Other Formative Assessments</p> <ul style="list-style-type: none"> • Numbers on the 1,000 Chart <ul style="list-style-type: none"> - Read, write, and locate numbers on 1,000 chart - Sequence and break apart three digit numbers using place value • Addition Strategies <ul style="list-style-type: none"> - Solve three digit addition problems using accurate and efficient strategies • How Far Did They Travel? <ul style="list-style-type: none"> - Solve subtraction problems involving missing parts <p>End of Unit Assessment</p>

- Solve three digit addition problems. Record strategy.
- Solve three digit subtraction problems. Record strategy.
- Solve 2 and 3 digit story problems. Write equation. Record strategy.

Suggested Resources

- [Howard County Math Wiki](#), Grade 3. June 23, 2014.
- [K-5 Math Teaching Resources](http://www.k-5mathteachingresources.com/), K-5 Math Teaching Resources, LLC. <http://www.k-5mathteachingresources.com/>. May 9, 2014.
- Russell, Susan Jo and Karen Economopoulos. (Second Edition, 2012) *Investigations in Number, Data, and Space, Grade 3: Unit 3, Collections and Travel Stories*. Upper Saddle River, NJ: Pearson.
- Van de Walle, John, et al. *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 3-5*, Second Edition. Boston: Pearson, 2014.

New Milford Public Schools

Committee Member(s): Corby Kennison, Megan Lago, Catherine Wilson Jim Winter, Stephanie Zappone Unit 4	Course/Subject: Mathematics Grade Level: 3 # of Weeks: 5
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Identify Desired Results

Common Core Standards

Standards in Unit

- (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. (Standards also in Ten-Minute Math)
- (3.MD.5) Recognize area as an attribute of plane figures and understand concepts of area measurement. 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. (a) 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. (b)
- (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. 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. (a) 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. (b) 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. (d)
- (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.
- (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. (Standards also in Ten-Minute Math)

Standards Only in Classroom Routines/Ten-Minute Math

- (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.

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that ...)	Essential Questions Inquiry used to explore generalizations
<ul style="list-style-type: none"> • Use place value understanding to round whole numbers to the nearest 10 or 100. • Addition and subtraction problems can be solved with a variety of strategies. • Understanding place value can lead to number sense and efficient strategies for computing with numbers. • Area is an expression of how much surface area is covered, not a length. Area is an attribute used to describe and measure 2D (plane) figures in square units. Measurement processes are used in everyday life to describe and quantify the world. • Perimeter describes the distance around a figure. Perimeter is an attribute used to describe and measure 2D figures. Measurement processes are used in everyday life to describe and quantify the world. • Shapes in different categories may share attributes and the shared attributes can define a larger category. 	<ul style="list-style-type: none"> • What is area? Why does "what" we measure influence "how" we measure? • What is perimeter? Why does "what" we measure influence "how" we measure? • How do attributes better describe a shape or object? How can you classify shapes 2-D shape according to their attributes? What is a polygon? What is a quadrilateral? • How does rounding help us make sense of numbers? • How can I add/subtract two numbers?

Expected Performances
What students should know and be able to do

Students will know the following:

- Students continue to develop their ability to use measurement tools as they work on accurate linear measurement techniques.
- Students learn to identify angles by their relationship to a right angle. (Is the angle greater than, less than, or equal to a 90-degree angle?)
- Students develop an understanding of area as the amount of flat space an object covers and determine the area of 2-D shapes in square units.
- LogoPaths, a Logo programming environment designed for Investigations students in Grades 3–5 is introduced in this unit. It allows students to explore geometrical relationships, especially focusing on angle, length, and perimeter, patterns in sides and angles, and characteristics of specific shapes.

Students will be able to do the following:

- Identify and measure the perimeter of a figure using U.S. standard and metric units.
- Identify and find the area of given figures by counting whole and partial square units.
- Identify triangles as three-sided closed figured with three vertices and three angles.
- Identify right angles, and recognize whether an angle is larger or smaller than a right angle.

Character Attributes

- Cooperation
- Respect
- Responsibility
- Perseverance

Technology Competencies

- None

Develop Teaching and Learning Plan

Teaching Strategies:

Use a math workshop model with teacher-directed mini-lesson

- to provide students with repeated experiences with concepts and skills
- to provide time for teachers to work with small groups of students

Use games to develop concepts and practice skills

Use student-centered activities and worthwhile math tasks

Use a variety of grouping structures

- Collaborative groups, partners, individuals

Orchestrate class discussions

- Focus discussions on important mathematics and student strategies
- Elicit participation by all students over the course of several discussions
- Facilitate student to student discourse

Encourage students to represent and discuss their thinking strategies

Use Classroom Routines/Ten-Minute

Learning Activities:

- Understand and find perimeter of 2D shapes
 - Logo Paths: Missing Measures
 - Ordering Shapes by Perimeter
 - Perimeter Problems
- Understand area is measured using squares and triangles
 - The Perfect Cover Up
 - Tetromino Puzzle
 - Logo Paths 200 Steps
 - Logo Paths 400 Steps
- Discuss different shapes with the same area
 - Shape Poster
- Determine area and perimeter of irregular shapes
 - How Big is Your Foot?
 - What's the Area?
- Identify and discuss attributes of triangles: three sides, three vertices, three angles
 - Building Triangles
 - Tricky Triangles
- Identify and discuss attributes of quadrilaterals: four sides, four vertices, four angles

<p>Math to provide on-going practice and review</p> <ul style="list-style-type: none"> • Classroom Routines: <ul style="list-style-type: none"> • What's the Temperature <ul style="list-style-type: none"> • Reading a thermometer, learning to associate different temperatures with words, and establishing landmark temperatures. • Reading information in a table, on a graph, and interpreting the meaning of the shape of a graph. • Practicing Place Value <ul style="list-style-type: none"> • Recognizing and interpreting the value of each digit in two-and three-digit numbers. • Finding different combinations of a number, using only 100s, 10s, and 1s, and recognizing their equivalence. • Reading and writing numbers up to 1,000. • Quick Images <ul style="list-style-type: none"> • Decomposing images of 2-D and 3-D shapes and then recombining them to make a given design. • Developing language and concepts needed to communicate about spatial relationships. 	<ul style="list-style-type: none"> - Building Quadrilaterals • Understand, discuss, and compare angle sizes i.e. right angle equals 90 degrees <ul style="list-style-type: none"> - Finding Angles
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Assessments	
Performance Task(s)	Other Evidence
<p>Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)</p> <p>Goal:</p> <p>Role:</p> <p>Audience:</p> <p>Situation:</p> <p>Product or Performance:</p> <p>Standards for Success:</p>	<p>Application that is functional in a classroom context to evaluate student achievement of desired results</p> <p>Ongoing Formative Assessments:</p> <p>Observing Students</p> <ul style="list-style-type: none"> • Accurately identify and measure perimeter • Accurately find and measure area. • Recognize triangles • Find and identify right angles • Find and identify angles smaller and larger than right angles <p>Other Formative Assessments</p> <ul style="list-style-type: none"> • Measuring Perimeter: Accurately Measure Perimeter of irregular shapes

	<ul style="list-style-type: none"> • Make a Shape: Create a shape with a given area <p>End of Unit Assessment</p> <ul style="list-style-type: none"> • Accurately determine area of an irregular shape and justify thinking • Identify triangles • List two attributes of triangles • Justify why a figure is not a triangle • Identify a right angle, an angle less than 90 degrees, and an angle greater than 90 degrees
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Suggested Resources

- [Howard County Math Wiki](#), Grade 3. June 23, 2014.
- [K-5 Math Teaching Resources](http://www.k-5mathteachingresources.com/), K-5 Math Teaching Resources, LLC. <http://www.k-5mathteachingresources.com/> . May 9, 2014.
- Russell, Susan Jo and Karen Economopoulos. (Second Edition, 2012) *Investigations in Number, Data, and Space, Grade 3: Unit 4, Perimeter, Angles, and Area*. Upper Saddle River, NJ: Pearson.
- Van de Walle, John, et al. *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 3-5*, Second Edition. Boston: Pearson, 2014.

New Milford Public Schools

Committee Member(s): Corby Kennison, Megan Lago, Catherine Wilson Jim Winter, Stephanie Zappone Unit 5	Course/Subject: Mathematics Grade Level: 3 # of Weeks: 6
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Identify Desired Results

Common Core Standards

Standards in Unit

- (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, e.g., 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 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. (See Table 2.)
- (3.OA.4) Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
- (3.OA.5) Apply properties of operations as strategies to multiply and divide. (Students need not use formal terms for these properties.) (Standard also in Ten-Minute Math)
- (3.OA.6) Understand division as an unknown-factor problem.
- (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.
- (3.OA.8) Solve two-step word 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. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations)).
- (3.OA.9) Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.
- (3.NBT.3) Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations.
- (3.MD.7) Relate area to the operations of multiplication and addition. 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. (a) 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. (b) 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. (c) 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. (d)

Standards Only in Classroom Routines/Ten-Minute Math

- (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.
- (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.

<p style="text-align: center;">Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that ...)</p>	<p style="text-align: center;">Essential Questions Inquiry used to explore generalizations</p>
<ul style="list-style-type: none"> • Multiplication and division situations involve equal-size groups, arrays, and/or area models. • Multiplication and division can be used to solve problems. • Numbers can be multiplied in any order and the product remains the same. The commutative, associative, and distributive properties can be used to develop efficient strategies to multiply and divide. • Any division problem can be thought of as a multiplication fact showing a missing factor. • Knowing basic facts is useful when learning math. Patterns and properties of operations are helpful for learning basic facts. Basic facts are learned through understanding and practice. • More than one step or operation may be needed to solve a problem. Thinking about our answers and their reasonableness helps us determine if our solution <i>could</i> be correct. • Area is an expression of how much surface is covered using square 	<ul style="list-style-type: none"> • Which situations can be represented with multiplication and division? When would you use multiplication or division to solve problems? • What are different meanings of division? How is division related to other operations? • How can different strategies be helpful when solving a problem? • How are multiplication and division related? How can different strategies be helpful when solving a problem? • How can the properties of operations be used to explain/justify answers? • How can the relationship between multiplication and division be helpful? • What strategies can we use to recall facts that we don't know automatically? • What strategies can we use to solve problems? Is your answer reasonable? • How can finding patterns help you learn basic facts? How can seeing patterns help you with knowing when an answer is reasonable? • How is multiplying with multiples of 10 similar to multiplying one-digit numbers? • What is area? Why does "what" we measure influence "how" we measure?

<p>units. Measurement processes are used in everyday life to describe and quantify the world.</p>	
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<p>Expected Performances What students should know and be able to do</p>

<p>Students will know the following:</p> <ul style="list-style-type: none"> • Students develop an understanding of multiplication as combining a number of equal groups and division as splitting a quantity into equal groups. This understanding is developed as students highlight multiples on 100 charts, describe patterns in sets of multiples, and compare sets of multiples to each other. • Students represent multiplication and division situations with groups, rectangular arrays, and by writing multiplication and division story problems. • Students achieve fluency with multiplication combinations with products to 50 and consider the relationship between multiplication and division (e.g., $6 \times 4 = 24$; $24 \div 6 = 4$). <p>Students will be able to do the following:</p> <ul style="list-style-type: none"> • Demonstrate an understanding of multiplication and division as involving groups of equal groups. • Solve multiplication combinations and related division problems by using skip counting or known multiplication combinations. • Interpret and use multiplication and division notation. • Demonstrate fluency with multiplication combinations with products up to 50 (by end of Grade 3).
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<p>Character Attributes</p>

<ul style="list-style-type: none"> • Cooperation • Respect • Responsibility • Perseverance
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<p>Technology Competencies</p>

<ul style="list-style-type: none"> • None
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<p>Develop Teaching and Learning Plan</p>
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<p>Teaching Strategies:</p> <p>Use a math workshop model with teacher-directed mini-lesson</p> <ul style="list-style-type: none"> • to provide students with repeated experiences with concepts and skills • to provide time for teachers to work with small groups of students <p>Use games to develop concepts and practice skills</p> <p>Use student-centered activities and worthwhile math tasks</p>	<p>Learning Activities:</p> <ul style="list-style-type: none"> • Understand, discuss, and explain multiplication in terms of combining equal groups • Identify and discuss the number of groups, number in each group, and product using multiplication notation • Discuss strategies for writing and solving multiplication problems <ul style="list-style-type: none"> - Picture Problems • Understand and describe the relationship
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<p>Use a variety of grouping structures</p> <ul style="list-style-type: none"> • Collaborative groups, partners, individuals <p>Orchestrate class discussions</p> <ul style="list-style-type: none"> • Focus discussions on important mathematics and student strategies • Elicit participation by all students over the course of several discussions • Facilitate student to student discourse <p>Encourage students to represent and discuss their thinking strategies</p> <p>Use Classroom Routines/Ten-Minute Math to provide on-going practice and review</p> <ul style="list-style-type: none"> • Classroom Routines: <ul style="list-style-type: none"> • What's the Temperature? <ul style="list-style-type: none"> • Reading a thermometer, learning to associate different temperatures with words, and establishing landmark temperatures. • Reading information in a table, on a graph, and interpreting the meaning of the shape of a graph. • Ten-Minute Math: <ul style="list-style-type: none"> • Counting Around the Class <ul style="list-style-type: none"> • Finding the multiples of numbers through skip counting. • Becoming familiar with multiplication patterns. • Understanding the relationship between skip counting and multiplication. • What Time is It? <ul style="list-style-type: none"> • Naming, notating, and telling time to the nearest 5 minutes on a digital or analog clock. • Telling time to any minute on a digital or analog clock • Determining intervals of time to the minute. 	<p>among skip counting, repeated addition, and multiplication (for the multiples of 2,3,4,5,6,10)</p> <ul style="list-style-type: none"> • Explore and understand how doubling or halving one factor doubles or halves the product • Discuss and use arrays to model multiplication situations <ul style="list-style-type: none"> - Arranging Chairs - Play game: Factor Pairs - Play game: Count and Compare • Explain how to use arrays to find factors of two digit numbers to 30 • Use known multiplication combination to determine solutions to unknown problems • Understand, discuss, and explain division as the splitting of quantity into equal groups and correctly read and write division notation • Use the inverse between multiplication and division to solve problems <ul style="list-style-type: none"> - Class Multiplication and Division Book - Play game: Missing Factors • Discuss strategies to write and solve division story problems
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Assessments	
Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
<p>Goal:</p> <p>Role:</p> <p>Audience:</p> <p>Situation:</p> <p>Product or Performance:</p> <p>Standards for Success:</p>	<p>Ongoing Formative Assessments:</p> <p>Observing Students</p> <ul style="list-style-type: none"> • Write multiplication problems to match a picture • Identify skip counting patterns and fill in missing numbers for multiples of 3, 6, 5, and 10) • Solve story problems using multiplication and division • Use known combinations to solve unknown multiplication combination <p>Other Formative Assessments</p> <ul style="list-style-type: none"> • Solving Problems About Our Picture <ul style="list-style-type: none"> - Write multiplication equations and sentences to describe the number of groups, number in each groups, and product • Counting Around the Class <ul style="list-style-type: none"> - Solve multiplication and division problems using skip counting or known combinations <p>End of Unit Assessment</p> <ul style="list-style-type: none"> • Accurately multiply 3 x 6 and 6 x 6 story problems. Write equations. • Solve story problems for “how many groups of 4 are in 36?” Write equation.
Suggested Resources	
<ul style="list-style-type: none"> • Howard County Math Wiki, Grade 3. June 23, 2014. • K-5 Math Teaching Resources, K-5 Math Teaching Resources, LLC. http://www.k-5mathteachingresources.com/ . May 9, 2014. • Russell, Susan Jo and Karen Economopoulos. (Second Edition, 2012) <i>Investigations in Number, Data, and Space, Grade 3: Unit 5, Equal Groups</i>. Upper Saddle River, NJ: Pearson. • Van de Walle, John, et al. <i>Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 3-5</i>, Second Edition. Boston: Pearson, 2014. 	

New Milford Public Schools

Committee Member(s): Corby Kennison, Megan Lago, Catherine Wilson, Jim Winter, Stephanie Zappone Unit Title: Unit 6	Course/Subject: Mathematics Grade Level: Grade 3 # of Weeks: 3
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Identify Desired Results

Common Core Standard

Standards in the Unit

- (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.8) Solve two-step word 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.*
- (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.

Standards Only in the Classroom Routines/Ten-Minute Math

- (3.OA.5) Apply properties of operations as strategies to multiply and divide.²
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.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.

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that ...)	Essential Questions Inquiry used to explore generalizations
<ul style="list-style-type: none"> Patterns can be generalized. 	<ul style="list-style-type: none"> What strategies can be used to continue a sequence? How can patterns be expressed as a rule? How can rules be used to determine unknowns?
Expected Performances What students should know and be able to do	
<p>Students will know the following:</p> <ul style="list-style-type: none"> Students use tables and line graphs to show changes over time. They use representations of functions involving constant change that can be described by mathematical rules and functions involving variable changes that cannot, such as temperature over time. Students interpret graphs to describe and compare temperature trends. They also compare different situations of constant change. Students construct, describe, and extend visual and number sequences. <p>Students will be able to do the following:</p> <ul style="list-style-type: none"> Interpret graphs of change over time, including both the meaning of points on the graph and how the graph shows that values are increasing, decreasing, or staying the same. Interpret temperature values (i.e., relate temperature to seasons, to what outdoor clothing would be needed, and so on). Create a table for a situation with a constant rate of change and explain the values in the table in terms of the situation. Compare related situations with a constant rate of change by interpreting the graphs, tables, and sequences that represent those situations. 	
Character Attributes	
<ul style="list-style-type: none"> Cooperation Respect Responsibility Perseverance 	
Technology Competencies	
<ul style="list-style-type: none"> None 	

Develop Teaching and Learning Plan

Teaching Strategies:

Use a math workshop model with teacher-directed mini-lesson

- to provide students with repeated experiences with concepts and skills
- to provide time for teachers to work with small groups of students

Use games to develop concepts and practice skills

Use student-centered activities and worthwhile math tasks

Use a variety of grouping structures

- Collaborative groups, partners, individuals

Orchestrate class discussions

- Focus discussions on important mathematics and student strategies
- Elicit participation by all students over the course of several discussions
- Facilitate student to student discourse

Encourage students to represent and discuss their thinking strategies

Use Classroom Routines/Ten-Minute Math to provide on-going practice and review

practice and review

- Classroom Routines:
 - What's the Temperature?
 - Reading a thermometer, learning to associate different temperatures with words, and establishing landmark temperatures.
 - Reading information in a table, on a graph, and interpreting the meaning of the shape of a graph.
- Ten-Minute Math:
 - Guess My Rule
 - Using evidence and forming questions to make hypotheses about common characteristics of groups, people or things
 - Systematically eliminating possibilities

Learning Activities:

- Interpret, describe, and discuss the shape of a line graph with regards to temperature
 - Temperature Around the World
- Read, interpret, and find the difference between high and low temperature on a line graph or thermometer.
 - Temperature Differences
- Associate, discuss, and show how a story corresponds with a graph
 - Summer Days
 - Winter Days
- Identify, discuss, explore, and extend patterns
 - Examining Green Cubes
 - Examining Red and Blue Cubes
 - What Color Is It?
- Use tables to explore, express, compare, and describe relationships and rate of change between two situations
 - Magic Marbles of Rhomaar
- Find, interpret, discuss, and develop rules relating one variable to another with a constant rate of change
 - Tables that Go By 5
- Make, discuss, compare, and interpret graphs from table data

<ul style="list-style-type: none"> • Using math terms to describe numbers • Today's Number • Generating equivalent expressions • Practicing computation • Using notation to record expressions 	
Assessments	
Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
<p>Goal:</p> <p>Role:</p> <p>Audience:</p> <p>Situation:</p> <p>Product or Performance:</p> <p>Standards for Success:</p>	<p>Ongoing Formative Assessments:</p> <p>Observing Students</p> <ul style="list-style-type: none"> • Identify high and low points and differences on a graph • Match stories to corresponding graphs • Compare two situations with a constant rate of change • Plot, read, and interpret a graph made from a table <p>Other Formative Assessments</p> <ul style="list-style-type: none"> • A Summer Day in Cairo, Egypt <ul style="list-style-type: none"> ○ Describe the shape of a graph. Explain what it shows ○ Identify the high and low temperatures on a graph ○ Interpret temperature in terms of clothing choice ○ Compare two related situations <p>End of Unit Assessment</p> <ul style="list-style-type: none"> • Identify highest and lowest temperature on a graph • Describe fluctuations in temperature • Compare similarities and differences in temperature change • Accurately complete a table, calculate miles over multiple days. Explain calculation

Suggested Resources

- [Howard County Math Wiki](#), Grade 3. June 23, 2014.
- [K-5 Math Teaching Resources](http://www.k-5mathteachingresources.com/), K-5 Math Teaching Resources, LLC. <http://www.k-5mathteachingresources.com/> . May 9, 2014.
- Russell, Susan Jo and Karen Economopoulos. (Second Edition, 2012) *Investigations in Number, Data, and Space, Grade 3: Unit 6, Stories, Tables, and Graphs*. Upper Saddle River, NJ: Pearson.
- Van de Walle, John, et al. *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 3-5*, Second Edition. Boston: Pearson, 2014.

New Milford Public Schools

Committee Member(s): Corby Kennison, Megan Lago, Catherine Wilson Jim Winter, Stephanie Zappone Unit Title: Unit 7	Course/Subject: Mathematics Grade Level: Grade 3 # of Weeks: 5 weeks
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Identify Desired Results

Common Core Standard

Standards in the Unit

- (3.NF.1) Understand 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. *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.*
 - (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.
- (3.G.2) Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *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.*

Standards in the Classroom Routines/Ten-Minute Math

- (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.5) Apply properties of operations as strategies to multiply and divide.²
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.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.
- (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.

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that ...)	Essential Questions Inquiry used to explore generalizations
<ul style="list-style-type: none"> • Fractions describe quantities between whole numbers. 	<ul style="list-style-type: none"> • What are different interpretations of fractions?

Expected Performances

What students should know and be able to do

Students will know the following:

- Students use a variety of contexts (rectangles representing “brownies,” pattern block “cookies,” and groups of objects) to develop their understanding of fractions as representing equal parts of a whole.
- Students work with commonly used fractions and their equivalencies (e.g., $3/6$ and $2/4$ both equal one-half of the same whole) and use fractions and mixed numbers as they solve sharing problems and build wholes from fractional parts.
- Students are introduced to decimal fractions in the context of money and gain familiarity with decimal equivalents for one-fourth and one-half.

Students will be able to do the following:

- Divide a single whole or a quantity into equal parts, and name those parts as fractions or mixed numbers.
- Identify equivalent fractions (e.g. $3/6 = 1/2$ and $1/3 = 2/6$)
- Find combinations of fractions that are equal to one and to other fractions. e.g. $3/6 + 1/2 = 1$; $1/6 + 1/6 = 1/3$; and $1/3 + 1/6 = 1/2$)

Character Attributes

- Cooperation
- Respect
- Responsibility
- Perseverance

Technology Competencies

- None

Develop Teaching and Learning Plan

Teaching Strategies:

Use a math workshop model with teacher-directed mini-lesson

- to provide students with repeated experiences with concepts and skills
- to provide time for teachers to work with small groups of students

Use games to develop concepts and practice skills

Use student-centered activities and worthwhile math tasks

Use a variety of grouping structures

- Collaborative groups, partners, individuals

Orchestrate class discussions

- Focus discussions on important mathematics and student strategies
- Elicit participation by all students over the course of several discussions
- Facilitate student to student discourse

Encourage students to represent and discuss their thinking strategies

Use Classroom Routines/Ten-Minute Math to provide on-going practice and review

- Classroom Routines:
 - What's the Temperature?
 - Reading a thermometer, learning to associate different temperatures with words, and establishing landmark temperatures.
 - Reading information in a table, on a graph, and interpreting the meaning of the shape of a graph.

Learning Activities:

- Explore and discuss how to divide an area or group into equal parts
 - One Brownie to Share
- Name and discuss fractional parts with fractions
- Discuss, identify, and use fractional notation to record equivalencies (ie: $3/6=1/2$)
 - Sharing Several Brownies
 - Sharing Many Things
- Explore, discuss, and represent ways to combine fractions that sum to one
 - Cutting Up Cookies
 - Play game: The Fraction Cookie
- Identify, discuss, and explore equivalent fractional part combinations($1/2= 1/3+1/6$)
 - Half Yellow Designs
- Interpret, identify, and discuss equivalent fractions and decimals for values involving $1/4$'s and $1/2$'s, including those greater than one whole
 - Can We Split It?
 - Sharing With Fractions and Decimals

<ul style="list-style-type: none"> • Ten-Minute Math: <ul style="list-style-type: none"> • What Time is It? <ul style="list-style-type: none"> • Naming, notating, and telling time to the nearest 5 minutes on a digital or analog clock. • Telling time to any minute on a digital or analog clock • Determining intervals of time to the minute. • Today's Number <ul style="list-style-type: none"> • Generating equivalent expressions • Practicing computation • Using notation to record expressions 	
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Assessments	
Performance Task(s) Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Other Evidence Application that is functional in a classroom context to evaluate student achievement of desired results
<p>Goal:</p> <p>Role:</p> <p>Audience:</p> <p>Situation:</p> <p>Product or Performance:</p> <p>Standards for Success:</p>	<p>Ongoing Formative Assessments:</p> <p>Observing Students</p> <ul style="list-style-type: none"> • Create and label equal parts • Recognize equivalent fractional amounts • Combine fractions to equal a whole <p>Other Formative Assessments</p> <ul style="list-style-type: none"> • Sharing Four Brownies: Divide groups into equal shares and identify fractional parts • Many Ways to Make a Share: Identify equivalent fractions and combine fractions to equal one whole <p>End of Unit Assessment</p> <ul style="list-style-type: none"> • Equally divide seven brownies among five people. Explain • Determine whether two fractions combined equal one whole

Suggested Resources

- [Howard County Math Wiki](#), Grade 3. June 23, 2014.
- [K-5 Math Teaching Resources](http://www.k-5mathteachingresources.com/), K-5 Math Teaching Resources, LLC. <http://www.k-5mathteachingresources.com/> . May 9, 2014.
- Russell, Susan Jo and Karen Economopoulos. (Second Edition, 2012) *Investigations in Number, Data, and Space, Grade 3: Unit 7, Finding Fair Shares..* Upper Saddle River, NJ: Pearson.
- Van de Walle, John, et al. *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 3-5*, Second Edition. Boston: Pearson, 2014.

New Milford Public Schools

Committee Member(s): Corby Kennison, Megan Lago, Catherine Wilson Jim Winter, Stephanie Zappone Unit Title: Unit 8	Course/Subject: Mathematics Grade Level: Grade 3 # of Weeks: 5
Identify Desired Results	
Common Core Standard	
<p>Standards in the Unit</p> <ul style="list-style-type: none"> • (3.OA.8) Solve two-step word 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. <i>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.</i> • (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. <p>Standards Only in the Classroom Routines/Ten-Minute Math</p> <ul style="list-style-type: none"> • (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. 	
Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that ...)	Essential Questions Inquiry used to explore generalizations
<ul style="list-style-type: none"> • Addition and subtraction of numbers can be done with place value and strategy understanding. • Understanding place value can lead to number sense and efficient strategies for computing with numbers. 	<ul style="list-style-type: none"> • How can I add and subtract?

Expected Performances

What students should know and be able to do

Students will know the following:

- Students further refine their addition strategies with problems involving any three-digit numbers as they identify and name these strategies.
- They continue to solve a variety of subtraction problems and examine their strategies for subtracting any two- and three-digit numbers in greater depth.
- Students extend their work with place value by estimating the sum of three-digit numbers (Will the sum be more or less than 400?) and adding and subtracting multiples of 10 and 100 to and from three-digit numbers. In this unit, students are assessed on fluency with subtraction facts.

Students will be able to do the following:

- Add multiples of 10 and 100 (up to 1,000) to and subtract them any 3-digit number.
- Solve 3-digit addition problems using at least one strategy efficiently.
- Demonstrate fluency with subtraction problems related to the addition combinations to 10 + 10 (the subtraction facts)
- Solve subtraction problems with 3-digit numbers using strategies that involve either subtracting a number in parts, adding up, or subtracting.
- Demonstrate fluency with multiplication combinations with products up to 50.

Character Attributes

- Cooperation
- Respect
- Responsibility
- Perseverance

Technology Competencies

- None

Develop Teaching and Learning Plan

Teaching Strategies:

Use a math workshop model with teacher-directed mini-lesson

- to provide students with repeated experiences with concepts and skills
- to provide time for teachers to work with small groups of students

Use games to develop concepts and practice skills

Use student-centered activities and worthwhile math tasks

Use a variety of grouping structures

- Collaborative groups, partners, individuals

Orchestrate class discussions

Learning Activities:

- Explore and discuss strategies to subtract from multiples of 100
 - Paper Clip Problems
 - Play game: Capture (300 to 600)
- Discuss and explore adding multiples of 10 and 100 to, and subtracting them from 3 digit numbers
 - Related Subtraction Problems
- Identify, explore, and discuss 3 digit numbers (strategies will be: change the number to create an easier problem, addition starter problems, break numbers apart)
- Solve and discuss addition problems with more than 2 addends

- Focus discussions on important mathematics and student strategies
- Elicit participation by all students over the course of several discussions
- Facilitate student to student discourse

Encourage students to represent and discuss their thinking strategies

Use Classroom Routines/Ten-Minute Math to provide on-going practice and review

practice and review

- Classroom Routines:
 - What's the Temperature?
 - Reading a thermometer, learning to associate different temperatures with words, and establishing landmark temperatures.
 - Reading information in a table, on a graph, and interpreting the meaning of the shape of a graph.
- Ten-Minute Math:
 - Guess My Rule
 - Using evidence and forming questions to make hypotheses about common characteristics of groups, people or things
 - Systematically eliminating possibilities
 - Using math terms to describe numbers
 - Today's Number
 - Generating equivalent expressions
 - Practicing computation
 - Using notation to record expressions

- Multiple Addends Problem
- Play game: Collections Match

- Discuss and develop strategies for subtracting 3 digit problems (strategies will be: subtracting 1 number in parts, adding up, subtracting back)
 - Play game: Collections Compare
- Explore and discuss subtraction problems that involve comparison, removal, or finding a missing part
 - Travel Problems
 - How Much Change
 - Earning and Spending
- Fluently know and use subtraction problems related to the addition combinations to 10 plus 10
- Solve addition and subtraction problems with more than 1 step
 - Book Orders
 - 2 Step Money Problems

Assessments	
Performance Task(s)	Other Evidence
Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Application that is functional in a classroom context to evaluate student achievement of desired results
<p>Goal:</p> <p>Role:</p> <p>Audience:</p> <p>Situation:</p> <p>Product or Performance:</p> <p>Standards for Success:</p>	<p>Ongoing Formative Assessments:</p> <p>Observing Students</p> <ul style="list-style-type: none"> • Add and subtract single digit numbers and multiples of 10 and 100 • Use 1 strategy efficiently to solve 3 digit addition problems • Fluently subtract problems related to addition combinations to 10 plus 10 • Use a strategy efficiently to solve subtraction problems involving 3 digit numbers. <p>Other Formative Assessments</p> <ul style="list-style-type: none"> • Problems About: Capture (300 to 600) • Addition Strategies: solve 3 digit addition problems using at least 1 strategy efficiently • Subtraction Facts: demonstrate fluency with subtraction problems related to the addition combinations to 10 plus 10 • Subtraction Strategies: solve subtraction problems with 3 digit numbers using at least 1 strategy efficiently • Multiplication Combinations Check (students have been practicing these multiplication combinations since their work in Unit 5): demonstrate fluency with multiplication combinations with products to 50 <p>End of Unit Assessment</p> <ul style="list-style-type: none"> • Use at least 1 addition strategy efficiently and accurately • Solve subtraction problems with 3 digit numbers using at least 1 strategy efficiently

Suggested Resources

- [Howard County Math Wiki](#), Grade 3. June 23, 2014.
- [K-5 Math Teaching Resources](http://www.k-5mathteachingresources.com/), K-5 Math Teaching Resources, LLC. <http://www.k-5mathteachingresources.com/> . May 9, 2014.
- Russell, Susan Jo and Karen Economopoulos. (Second Edition, 2012) *Investigations in Number, Data, and Space, Grade 3: Unit 8, How Many Hundreds? How Many Miles?* Upper Saddle River, NJ: Pearson.
- Van de Walle, John, et al. *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 3-5*, Second Edition. Boston: Pearson, 2014.

New Milford Public Schools

Committee Member(s): Corby Kennison, Megan Lago, Catherine Wilson Jim Winter, Stephanie Zappone Unit Title: Unit 9	Course/Subject: Mathematics Grade Level: Grade 3 # of Weeks: about 2 weeks (11 days)
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Identify Desired Results

Common Core Standard

Standards in the Unit

- (3.OA.8) Solve problems involving the four operations, and identify and explain patterns in arithmetic. Solve two-step word 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. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations).)
- (3.MD.2) Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (Excludes compound units such as cm^3 and finding the geometric volume of a container.) 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.

Standards Only in the Classroom Routines/Ten-Minute Math

- (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.

Enduring Understandings Generalizations of desired understanding via essential questions (Students will understand that ...)	Essential Questions Inquiry used to explore generalizations
<ul style="list-style-type: none"> • Measurement processes are used in everyday life to describe and quantify the world. (3.MD.2) 	<ul style="list-style-type: none"> • How do we choose the appropriate unit of measure? • How and why do we organize information? • How can we estimate the weight of an object? • How do we the measure the volume of objects/liquids?

Expected Performances

What students should know and be able to do

Students will know the following:

- Students develop ideas about the attributes of 3-D shapes and how these attributes determine classification as they sort and build common geometric solids.
- Students move back and forth between 2-D and 3-D as they build and describe 2-D representations of 3D objects and create 3-D objects from their 2-D representations.
- Students begin to develop important ideas about the measurement of volume as they examine the structure of 2-D box patterns and the number of cubes the 3-D box will hold.

Students will be able to do the following:

- Identify and compare attributes of 3-D solids.
- Determine the number of cubes (volume) that will fit in the box made by a given pattern.
- Design patterns for boxes that will hold a given number of cubes.

Character Attributes

- Cooperation
- Respect
- Responsibility
- Perseverance

Technology Competencies

- None

Develop Teaching and Learning Plan

Teaching Strategies:

Use a math workshop model with teacher-directed mini-lesson

- to provide students with repeated experiences with concepts and skills
- to provide time for teachers to work with small groups of students

Use games to develop concepts and practice skills

Use student-centered activities and worthwhile math tasks

Use a variety of grouping structures

- Collaborative groups, partners, individuals

Orchestrate class discussions

- Focus discussions on important mathematics and student strategies
- Elicit participation by all students

Learning Activities:

- Describe, explore, visualize, and discuss the components and properties of different classes of solids such as polyhedra and nonpolyhedra
 - Sorting Solids
 - Play game: What's My Shape?
 - Building Polyhedra
- Determine, explore, and discuss the number of shapes of the faces of cubes and other rectangular prisms and how they come together to form the whole
- Design patterns that make open boxes from cubes and rectangular prisms
 - Cube Patterns
 - Patterns for 2-Cube Boxes
- Determine, discuss, and explore the number and shapes of the faces of a

over the course of several discussions

- Facilitate student to student discourse

Encourage students to represent and discuss their thinking strategies
Use Classroom Routines/Ten-Minute Math to provide on-going practice and review

- Classroom Routines:
 - What's the Temperature?
 - Reading a thermometer, learning to associate different temperatures with words, and establishing landmark temperatures.
 - Reading information in a table, on a graph, and interpreting the meaning of the shape of a graph.
- Ten-Minute Math:
 - Practicing Place Value
 - Recognizing and interpreting value of each digit in 3-digit numbers
 - Find different equivalent combinations of numbers using hundreds, tens, and ones
 - Read and write numbers to 1000
 - Add and subtract multiples of 10 from 3-digit numbers
 - More or Less?
 - Break apart, reorder or combine numbers in a problem for easier computation
 - Use place value and known combinations to estimate sums and differences
 - Practice addition and subtraction
 - Quick Images: 3-D
 - Organize and analyze visual images
 - Develop language and concepts to communicate about spatial relationships
 - Decompose images of 3-D shapes and then recombine them to make a given structure

triangular pyramid and how they come together to form the whole

- Design patterns that make nets from triangular pyramids
 - Patterns for Triangular Pyramids
- Decompose images of 3-D shapes into congruent layers
 - Determine the Number of Cubes in a Box
 - Designing Boxes to Hold 12 Cubes
 - Riddles About Boxes
 - Designing Boxes to Hold 16 Cubes

Assessments	
Performance Task(s)	Other Evidence
Authentic application to evaluate student achievement of desired results designed according to GRASPS (one per marking period)	Application that is functional in a classroom context to evaluate student achievement of desired results
<p>Goal:</p> <p>Role:</p> <p>Audience:</p> <p>Situation:</p> <p>Product or Performance:</p> <p>Standards for Success:</p>	<p>Ongoing Formative Assessments:</p> <p>Observing Students</p> <ul style="list-style-type: none"> • Sort geometric solids by attributes • Decompose 3-D shapes by parts and layers • Design patterns for boxes that will hold a given number of cubes <p>Other Formative Assessments</p> <ul style="list-style-type: none"> • Building polyhedra from descriptions: build polyhedra from given attributes • Writing about how many cubes: explain how to determine the number of cubes that will fit in a box <p>End of Unit Assessment</p> <ul style="list-style-type: none"> • Correctly list 3 components of a 3 dimensional solid • Correctly list at least 1 attribute that solids share and 1 way they are different • Determine the number of cubes that will fit in a box. Explain • Correctly draw the sides of a box pattern to hold a given number of cubes when given the bottom of the box
Suggested Resources	
<ul style="list-style-type: none"> • Howard County Math Wiki, Grade 3. June 23, 2014. • K-5 Math Teaching Resources, K-5 Math Teaching Resources, LLC. http://www.k-5mathteachingresources.com/ . May 9, 2014. • Russell, Susan Jo and Karen Economopoulos. (Second Edition, 2012) <i>Investigations in Number, Data, and Space, Grade 3: Unit 9, Solids and Boxes..</i> Upper Saddle River, NJ: Pearson. • Van de Walle, John, et al. <i>Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 3-5</i>, Second Edition. Boston: Pearson, 2014. 	