

Course Name: 5th Grade Mathematics

Access: Heath Mathematics: Connections

STRAND: NUMBER AND OPERATIONS

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Understand division of whole numbers					
Understand the meaning of division of whole numbers, with and without remainders; relate division to fractions and to repeated subtraction.	N.MR.05.01 (Core)	p. 72-92 Note: AAA.math.com and similar sites are an excellent resource for all areas of math.	Divisor, dividend, quotient, remainder	Teachers can use chapter assessments from Heath, teacher-made assessments or go online. Quiz: Dividing Fractions Quiz Summary: Students demonstrate their knowledge of dividing both fractions and mixed numbers by completing this quiz.	Using Your Melon for Math: Applying Fraction Multiplication and Division to Recipes Summary: By increasing and decreasing the yield of recipes, students practice their fraction math skills
Relate division of whole numbers with remainders to the form $a = bq + r$. So, 34 divided by 5 = 6 r 4, so $5 \times 6 + 4 = 34$; note remainder (4) is smaller than divisor (6).	N.MR.05.02 (Core)				This is how to “check” a division problem. Also serves as a good review of multiplication.

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Understand division of whole numbers					
Write mathematical statements involving division for given situations.	N.MR.05.03 (Extended Core)	Assessment Guidelines: TEKS Mathematics Assessment Connections for Grade 5: Patterns Summary: There are 4 assessment tasks given. Each question requires students to use patterns, relationships, and algebraic thinking. Students must make generalizations based on patterns and relationships and describe relationships mathematically by using number sentences and diagrams.	Fair share		NCTM Illuminations: Food Court Lesson 03: The Creamery Summary: Students estimate then determine the number of ice cream sundae combinations that can be made with two topping possibilities and a number of ice cream flavors. They write number sentences for the number of combinations that can be made from a given number of possibilities.
Multiply and divide whole numbers					
Multiply a multi-digit number by a two-digit number; recognize and be able to explain common computational errors such as not accounting for place value.	N.FL.05.04 (Core)	p. 56-62 Abacus Summary: How does an abacus really work? Topic(s): Practice place value, multiplication, and addition. Source: Learning Network Abacus in Various Number Systems Summary: The history of the Abacus. Source: Alexander Bogomolny All About Place Values Summary: This is a set of pages that teach place value skills taught in K8 math courses. Each page contains an explanation, interactive practice, and challenge games about place values.	Place holder (automatic zero), lattice, product	Assessment Guidelines: Place Value Assessment Summary: A guideline for assessing student understanding of place value using cube manipulatives.	Lattice multiplication is an alternative method for multiplication NCTM Illuminations: Birthdays and the Binary System: A Magical Mixture Summary: This resource is a collection of three activities, all of which revolve around patterns and place value in the binary system. Students are drawn into the mathematics by the 'magical' ability to guess an unknown number and by the use of birthdays, something they find very relevant. MarcoPolo / NCTM Illuminations

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Multiply and divide whole numbers					
Solve applied problems involving multiplication and division of whole numbers.	N.MR.05.05 (Core)			Test Items/Worksheet: Divisibility Summary: These tables require students to find if a number such as 360 is divisible by any of the five number choices given. This tests student understanding of division.	Problem Solving and the Sports Page Summary: To encourage students to understand problem solving techniques and strategies by using box scores from the sports page.
Divide fluently up to a four digit number by a two digit number.	N.FL.05.06 (Core)		Double digit divisor	Test Items/Worksheet: Division With Remainders Summary: These problems test students' ability to do fairly simple division with the added difficulty of remainders.	Children need to guess and check to find reasonable options for quotient.

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Find prime factorization of whole numbers					
Find the prime factorization of numbers between 1 and 50, express in exponential notation, and understand that every whole number can be expressed as a product of primes.	N.MR.05.07 (Future Core)	p. 100-102 Decimals, Whole Numbers and Exponents Source: Math League Topics in Pre-Algebra Source: Giesele Glosser	Exponent, prime, composite, factor tree	Quiz: Least Common Multiple Quiz Source: Sarah Lane	Discuss finding GCF and reducing fractions NCTM Illuminations: Fun with Fractions Lesson 06: Class Attributes Summary: During this lesson, students create their own classroom survey or use the Classroom Survey to study the class and describe the set [class] in fractional parts.
Understand meaning of decimals, fractions and percentages					
Understand the relative magnitude of ones, tenths, and hundredths and the relationship of each place value to the place to its right, e.g., 1 is 10 tenths, one tenth is 10 hundredths.	N.ME.05.8 (Core)	p. 20-34 Abacus in Various Number Systems Source: Learning Network	Tenth, hundredth, thousandths		NCTM Illuminations: Birthdays and the Binary System: A Magical Mixture Source: MarcoPolo / NCTM Illuminations

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Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Understand meaning of decimals, fractions and percentages					
Understand percentages as parts of 100, use % notation, and express a part of a whole as a percentage.	N.ME.05.09 (Core)	p. 360 Arithmetic Resources Source: Math Archives Mathematical Exerciser Source: Link-systems.com Quia Mathematics Source: Quiz Corporation	Percent, percentage	NCTM Illuminations: Fun with Fractions - Length Lesson 07: Looking Back and Moving Forward Source: MarcoPolo / NCTM Illuminations NCTM Illuminations: Fun with Fractions Lesson 06: Looking Back and Moving Forward Source: MarcoPolo / NCTM Illuminations	Gold Seal: Clue About Credit Cards Source: ICLE: Marsha Kucker Gold Seal: Grocery Graphing Source: ICLE
Understand fractions as division statements; find equivalent fractions					
Understand a fraction as a statement of division, e.g., 2 divided 3 = $\frac{2}{3}$ using simple fractions and pictures to represent.	N.ME.05.10 (Extended Core)	NCTM Illuminations: Communicating about Mathematics Using Games Source: MarcoPolo / NCTM Illuminations All About Fractions Source: AAA Math BasketMath Interactive Source: Science Academy		Assessment Guidelines: Quilt Designs Source: Arkansas Smart Start Alignment to Frameworks Convert from a fraction to a decimal. Source: Webmath	Gold Seal: Jelly Beans and Fractions Source: ICLE: Marsha Kucker Adding and Subtracting Fractions Source: Yunling Zhang Almond Magi Source: Christy Clanton

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Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Understand fractions as division statements; find equivalent fractions					
<p>Given two fractions, express them as equivalent fractions with a common denominator, but not necessarily a least common denominator, e.g., $\frac{1}{2} = \frac{4}{8}$ and $\frac{3}{4} = \frac{6}{8}$; use denominators less than 12 or factors of 100.</p>	<p>N.ME.05.11 (Extended Core)</p>	<p>p. 266 fraction pizzas</p>	<p>Numerator, denominator, equivalent, factor, common denominator</p>	<p>NCTM Illuminations: Fun with Fractions - Length Lesson 07: Looking Back and Moving Forward Source: MarcoPolo / NCTM Illuminations NCTM Illuminations: Fun with Fractions Lesson 07: Looking Back and Moving Forward Source: MarcoPolo / NCTM Illuminations State Released Item: Delaware Student Testing Program Grade 5 Released Items: Mathematics- Problem Solving Source: Delaware Department of Education</p>	<p>NCTM Illuminations: Fun with Fractions - Length Lesson 01: Making and Investigating Fraction Strips Source: MarcoPolo / NCTM Illuminations NCTM Illuminations: Fun with Fractions - Length Lesson 02: More Fun with Fraction Strips Source: MarcoPolo / NCTM Illuminations</p>

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Multiply and divide fractions					
Find the product of two unit fractions with small denominators using area model.	N.FL.05.12 (Future Core)	p. 320-334		<p>State Released Item: Colorado CSAP 2001 Grade 5 Released Item: Mathematics-Computation and Reasoning Source: Colorado Department of Education</p> <p>State Released Items: Georgia CRCT Grade 5 Released Item 2002: Mathematics-Computation and Comprehension Source: Georgia Department of Education</p>	<p>Use pictures along side of algorithm. All Fractions Are Created Equal Source: Dawn Dantowitz And the Number Is... Source: Kathy Peters</p>
Divide a fraction by a whole number and a whole number by a fraction using simple unit fractions.	N.FL.05.13 (Future Core)	p. 336-342		<p>Quiz: Dividing Fractions Quiz Source: Mary Jane Cowell Quiz: Online Multiplicative Inverse Quiz Quiz: Online Multiplicative Inverse Quiz</p>	<p>Using Your Melon for Math: Applying Fraction Multiplication and Division to Recipes Source: The New York Times Learning Network</p>

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Add and subtract fractions using common denominators					
<p>Add and subtract fractions with unlike denominators of 1 through 12 and 100, using the common denominator that is the product of the denominators of the two fractions e.g., $\frac{3}{8} + \frac{7}{10} = \frac{(30 + 56)}{80} = \frac{86}{80}$.</p>	<p>N.FL.05.14 (Future Core)</p>	<p>p. 298</p>	<p>Like/unlike denominators</p>	<p>Quiz: Addition of Mixed Numbers Quiz Source: Oswego City School District State Released Item: Alaska Grade 6 Benchmark Test Released Item: Mathematics- Comprehension and Computation Source: Alaska Department of Education Test Item: Fraction Measurement Source: Oswego City School District</p>	<p>Adding and Subtracting Fractions Source: Yunling Zhang Mixing up Mixed Numbers Source: Missy Stevens - La. Challenge</p>
Multiply and divide by powers of ten					
<p>Multiply a whole number by powers of ten: .01, .1, 1, 10, 100, 1,000, and identify patterns.</p>	<p>N.FL.05.15 (Core)</p>	<p>p. 50 Decimals, Whole Numbers and Exponents Source: Math League Topics in Pre-Algebra Source: Giesele Glosser</p>	<p>Power of ten</p>	<p>Test Items/Worksheet: Mixed Multiplication Source: edHelper Test Items/Worksheet: Multiplication Ring Source: Balanced Assessment Program Test Prep: Exponents Source: Ed Fayette Test Prep: Exponents Worksheet Source: Cindy Murabito</p>	<p>NCTM Illuminations: Food Court Lesson 03: The Creamery Source: MarcoPolo / NCTM Illuminations Exploring Pascal's Triangle-Discovery Lesson-Math Forum Source: Math Forum/USI</p>

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Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Multiply and divide by powers of ten					
Multiply a whole number by powers of ten: .01, .1, 1, 10, 100, 1,000, and identify patterns.	N.FL.05.15 (Core)	p. 50 Decimals, Whole Numbers and Exponents Source: Math League Topics in Pre-Algebra Source: Giesele Glosser	Power of ten	Test Items/Worksheet: Mixed Multiplication Source: edHelper Test Items/Worksheet: Multiplication Ring Source: Balanced Assessment Program Test Prep: Exponents Source: Ed Fayette Test Prep: Exponents Worksheet Source: Cindy Murabito	NCTM Illuminations: Food Court Lesson 03: The Creamery Source: MarcoPolo / NCTM Illuminations Exploring Pascal's Triangle- Discovery Lesson-Math Forum Source: Math Forum/USI
Multiply one-digit whole numbers by decimals up to two decimal places.	N.MR.05.17 (Core)	p. 174-188		NCTM Illuminations: Its in the Cards Lesson 07: Looking Back and Moving Forward Source: MarcoPolo / NCTM Illuminations Quiz: Multiplying Decimals Source: Mary Jane Cowell	NCTM Illuminations: Its in the Cards Lesson 02: Looking for Calculator Patterns Source: MarcoPolo / NCTM Illuminations NCTM Illuminations: Its in the Cards Lesson 03: Working with Rows and Columns Source: MarcoPolo / NCTM Illuminations

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Solve applied problems with fractions					
<p>Given an applied situation involving addition and subtraction of fractions, write mathematical statements describing the situation.</p>	<p>N.FL.05.18 (Core)</p>	<p>Ask Dr. Math: Place Value Source: Dr. Math Archives Place Value and the Wonderful World of Insects Source: Learning Network Population Clock Source: Learning Network</p>	<p>Least common multiple (LCM)</p>	<p>Quiz: Addition of Mixed Numbers Quiz Source: Oswego City School District State Released Item: Alaska Grade 6 Benchmark Test Released Item: Mathematics-Comprehension and Computation Source: Alaska Department of Education</p>	<p>Adding and Subtracting Fractions Source: Yunling Zhang Cube Combinations Source: Christy Clanton Fraction Food Frenzy Source: Amy Gunn Fraction and Decimal Garden Source: Cindy Jacobs</p>
<p>Solve word problems that involve finding sums and differences of fractions with unlike denominators using knowledge of equivalent fractions.</p>	<p>N.MR.05.19 (Future Core)</p>			<p>NCTM Illuminations: Fun with Fractions - Length Lesson 07: Looking Back and Moving Forward Source: MarcoPolo / NCTM Illuminations NCTM Illuminations: Fun with Fractions Lesson 07: Looking Back and Moving Forward Source: MarcoPolo / NCTM Illuminations Quiz: Addition of Mixed Numbers Quiz Source: Oswego City School District</p>	<p>Pictures or fraction pizzas are helpful to prove equivalency of fractions with unlike denominators.</p> <p>NCTM Illuminations: Fun with Fractions - Length Lesson 01: Making and Investigating Fraction Strips Source: MarcoPolo / NCTM Illuminations</p>

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Solve applied problems with fractions					
Solve applied problems involving fractions and decimals; including rounding of answers and checking reasonableness; using examples involving money.	N.FL.05.20 (Core)	<p>p. 282-284 NCTM Illuminations: Communicating about Mathematics Using Games Source: MarcoPolo / NCTM Illuminations Ask Dr. Math: Place Value Source: Dr. Math Archives Pro Football Source: Pro Football Hall of Fame Rounding Decimals to Whole Numbers Game Source: S. Ahern Whole Numbers and Their Basic Properties Source: Math League</p>	Rounding, reasonableness	<p>Quiz: Grade 5 Comprehensive Math Assessment Source: Brainchild Corporation State Released Items: Georgia CRCT Grade 5 Released Item 2002: Mathematics-Computation and Comprehension Source: Georgia Department of Education Test Items/Worksheet: Cumulative Mathematics Assessment Source: TALKS 2003 Test Items/Worksheet: Divide a Decimal by a Decimal Source: edHelper</p>	<p>Discuss gas prices: How can you have 9/10 of a cent? Gold Seal: Picnic Lunch Source: ICLE NCTM Illuminations: Combinations: Ice-Cream Cones Source: MarcoPolo / NCTM Illuminations NCTM Illuminations: Food Court Lesson 02: The Soup Spot Source: MarcoPolo / NCTM Illuminations</p>
Solve for the unknown in such equations as $\frac{1}{4} + X = \frac{7}{12}$.	N.MR.05.21 (Future Core)		Variable, unknown	<p>State Released Item: Colorado CSAP 2001 Grade 5 Released Item: Mathematics-Computation and Reasoning Source: Colorado Department of Education Test Items/Worksheet: Fractions (Addition and Subtraction) Source: edHelper</p>	<p>Adding and Subtracting Fractions Source: Yunling Zhang</p>

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Express, interpret, and use ratios; find equivalencies					
Express fractions and decimals as percentages and vice versa.	N.MR.05.22 (Core)			Test Item: Fraction to Percent Source: Oswego City School District Test Items/Worksheet: Decimal Word Problems Source: edHelper Source: Dave Highbaugh - Kings Co. Office of Ed. – SCORE	Make a classroom equivalency chart Automobile Ownership Source: Catherine Schram - cschram@aol.net Introduction to Percent Source: Kenneth Surdell - Illinois Institute of Technology
Express ratios in several ways given applied situations, e.g., 3 cups to 5 people, 3:5, 3/5; recognize and find equivalent ratios.	N.ME.05.23 (Core)	p. 348-356	Ratio, equivalent ratios	State Released Items: Georgia CRCT Grade 5 Released Item 2002: Mathematics-Computation and Comprehension Source: Georgia Department of Education Test Item (Fill in the Blank): Money Exchange Word Problem Source: Alan & Hui Meng Test Prep: Coins, Money, and Fractions Source: Ed Fayette Test Prep: Converting Decimals to Fractions Source: Nicole Carroll Test Prep: Decimal and Metric Conversions Source: Sandy Harrison	Act out situations with children. Balanced Equations Source: Judy Fox Does More Wins Mean More Fans at the Ballpark? Source: Kent Anderson - Kings County Office of Ed. – SCORE Egyptian Numeration Pyramid Source: Frieda Bates Fractions and Equivalents Source: Jeannel Lopez

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STRAND: MEASUREMENT

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Know and convert among, measurement units within a given system					
<p>Recognize the equivalence of 1 liter, 1,000 ml, and 1,000 cubic cm, and include conversions among the liters, milliliters and cubic centimeters.</p>	<p>M.UN.05.01 (Future Core)</p>	<p>Anglo-Saxon Weights & Measures Source: Jack Proot Common Weights and Measures Source: Army Engineer Waterways Experiment Station Conversion Program Source: Lawrence Goetz Measurements Converter Source: Sergey Gershtein Metric Conversion Chart Source: National Institute of Systems and Measures Metric Conversions Source: National Institute of Standards Metric Units and Measurement Source: Math League U.S. System of Measurements Source: Centre for Innovation in Mathematics Teaching Quiz: Measuring Weight Quiz Source: Carol A. Carroll Quiz: Metric Units of Length Source: Carol A. Carroll State Released Item: Florida Comprehensive Assessment Test Grade 5 Released Item 2001: Mathematics-Comprehension and Computation Source: Florida Department of Education</p>	<p>All metric prefixes</p>	<p>Metric System Source: Webmath Quiz: Converting Metric Units Source: Paul DeRitter Quiz: Grade 5 Comprehensive Math Assessment Source: Brainchild Corporation Quiz: Measuring Mass Quiz Source: Carol A. Carroll</p>	<p>Use common containers: pop cans, 2 liters, etc.</p> <p>Assorted Sports (by Area) Source: Stephanie Loopstra Balanced Equations Source: Judy Fox Carpet Your Castle Source: Lee Anne Ingram, Winona Middle School, Winona, MS Centimeter Slinkies Source: Laurie Ayers Converting Celsius To Fahrenheit Source: Amaechi Onyeali - Carter Elementary, Chicago IL</p>

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STRAND: MEASUREMENT

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Know and convert among, measurement units within a given system					
<p>Know the units of measure of volume: cubic centimeters, cubic meter, cubic inches, cubic feet, cubic yards, and use their abbreviations.</p>	<p>M.UN.05.02 (Extended Core)</p>	<p>p. 396-402 Geo-Solid Conversion Program Source: Lawrence Goetz Whole Numbers and Multiplication Source: Explorer</p>	<p>Cubic</p>	<p>Assessment Guidelines: TEKS Mathematics Assessment Connections Source: Texas Education Agency Grade 5: Measurement Metric System Source: Webmath Quiz: Converting Metric Units Source: Paul DeRitter Quiz: Metric Units of Length Source: Carol A. Carroll State Released Items: Georgia CRCT Grade 5 Released Item 2002: Mathematics-Computation and Comprehension Source: Georgia Department of Education</p>	<p>Gold Seal: Volumes of Fun Source: ICLE: Thomas Venezio NCTM Illuminations: Ideas with Food Lesson 02: A Brownie Bake Source: MarcoPolo / NCTM Illuminations Area and Volume Source: Timothy Welch George Gorilla and Gallon Gorp Source: Sara Hubbard</p>
<p>Compare the relative sizes of one cubic inch to one cubic foot, and one cubic centimeter to one cubic meter.</p>	<p>M.UN.05.03 (Extended Core)</p>			<p>Assessment Guidelines: TEKS Mathematics Assessment Connections for Grade 5: Measurement Source: Texas Education Agency Metric System Source: Webmath Quiz: Converting Metric Units Source: Paul DeRitter Quiz: Measuring Mass Quiz Source: Carol A. Carroll Quiz: Metric Units of Length Source: Carol A. Carroll</p>	<p>NCTM Illuminations: Exploration of a Balance Lesson 03: Shifting the Balance Source: MarcoPolo / NCTM Illuminations</p>

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STRAND: MEASUREMENT

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Know and convert among, measurement units within a given system					
Convert measurements of length, weight, area, volume, and time within a given system using easily manipulated numbers.	M.UN.05.04 (Core)	Anglo-Saxon Weights & Measures Source: Jack Proot Animal Weight Source: Learning Network BasketMath Interactive Source: Science Academy Conversion Program Source: Lawrence Goetz Measurements Converter Source: Sergey Gershtein Metric Conversion Chart Source: National Institute of Systems and	Area, volume	Assessment Guidelines: TEKS Mathematics Assessment Connections for Grade 5: Measurement Source: Texas Education Agency Find the area of rectangles Source: Webmath Metric System Source: Webmath Quiz: Converting Metric Units Source: Paul DeRitter Quiz: Grade 5 Comprehensive Math Assessment Source: Brainchild Corporation	Gold Seal: All Wrapped Up Source: ICLE Gold Seal: Going Camping Source: ICLE Gold Seal: Home for the Birds Source: ICLE: Ben Lindeman Gold Seal: Measurement Activities Source: ICLE
Find areas of geometric shapes using formulas					
Represent relationships between areas of rectangles, triangles, and parallelograms using models.	M.PS.05.05 (Core)	p. 228-230 All About Geometry Source: AAA Math Fractions and Paper Folding Source: Bill Wagner, Hyde Park Career Academy General Shapes and Dimensions Source: Explorer Geometry Source: Math League	Rectangle, triangle, parallelogram	Assessment Guidelines: Ideal Classroom Source: Arkansas Smart Start Alignment to Frameworks Test Items/Worksheet: Circumference and Area Worksheet Source: Giesele Glosser Test Items/Worksheet: Computing Cost and Square Footage Source: Balanced Assessment Program Test Prep: Counting Perimeter, Area, and Volume Source: Nicole Carroll	Gold Seal: All Wrapped Up Source: ICLE Gold Seal: Architecture in the Classroom Source: ICLE: Deborah Karas Gold Seal: Be An Architect Source: ICLE

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STRAND: MEASUREMENT

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Find areas of geometric shapes using formulas					
<p>Understand and know how to use the area formula of a triangle: $A = 1/2 bh$ (where b is the length of the base and h is the height), and represent using models and manipulatives</p>	<p>M.TE.05.06 (Core)</p>	<p>p. 242 Fractions and Paper Folding Source: Bill Wagner, Hyde Park Career Academy Geometry Source: Math League Geometry Junkyard Source: David Eppstein Platonic Solids Source: Janine</p>	<p>Formula, base, height</p>	<p>Assessment Guidelines: Ideal Classroom Source: Arkansas Smart Start Alignment to Frameworks State Released Item: Florida Comprehensive Assessment Test Grade 5 Released Item 2001: Mathematics-Comprehension and Computation Source: Florida Department of Education Test Items/Worksheet: Area of a Triangle in a Circle Source: Balanced Assessment Program</p>	<p>Gold Seal: Architecture in the Classroom Source: ICLE: Deborah Karas Gold Seal: Be An Architect Source: ICLE Gold Seal: Building Giant Source: ICLE Gold Seal: Building with Polygons Source: ICLE Gold Seal: Maze Source: ICLE</p>
<p>Understand and know how to use the area formula for a parallelogram: $A = bh$, and represent using models and manipulatives</p>	<p>M.TE.05.07 (Core)</p>			<p>Test Prep: Counting Perimeter, Area, and Volume Source: Nicole Carroll Test Prep: Factors Used in Area and Volume Source: Nicole Carroll Test Prep: Measurement in Science and Social Studies Source: Carol A. Carroll Test Prep: Metric Units for Measuring Source: Carol A. Carroll</p>	<p>Gold Seal: Jack-o-Lantern Geometry Source: ICLE Gold Seal: Multilink Think Source: ICLE Gold Seal: Pyramid Under Construction Source: ICLE NCTM Illuminations: Exploring Geometric Solids and Their Properties Lesson 01: Getting to Know the Shapes Source: MarcoPolo / NCTM Illuminations</p>

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STRAND: MEASUREMENT

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Understand the concept of volume					
Build solids with unit cubes and state their volumes.	M.TE.05.08 (Not Assessed at State Level)				
Use filling (unit cubes or liquid), and counting or measuring to find the volume of a cube and rectangular prism.	M.TE.05.09 (Not Assessed at State Level)	Animal Olympics Source: Learning Network Apple Facts Source: Michigan State University Extension Conversion Program Source: Lawrence Goetz Measurements Converter Source: Sergey Gershtein Metric Units and Measurement Source: Math League U.S. System of Measurements Source: Centre for Innovation in Mathematics Teaching Whole Numbers and Multiplication Source: Explorer		Assessment Guidelines: TEKS Mathematics Assessment Connections for Grade 5: Measurement Source: Texas Education Agency State Released Items: Georgia CRCT Grade 5 Released Item 2002: Mathematics-Computation and Comprehension Source: Georgia Department of Education State Released Items: Kentucky Core Content Test Grade 5 Released Item: Mathematics-Computation and Comprehension Source: Kentucky Department of Education	NCTM Illuminations: Collecting The Rays Source: MarcoPolo / NCTM Illuminations NCTM Illuminations: Ideas with Food Lesson 02: A Brownie Bake Source: MarcoPolo / NCTM Illuminations Gold Seal: Volumes of Fun Source: ICLE: Thomas Venezio Gold Seal: Shipping Softballs Source: ICLE: David Nohara

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STRAND: MEASUREMENT

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Understand the concept of volume					
Solve applied problems about the volumes of rectangular prisms using multiplication and division and using the appropriate units.	M.PS.05.10 (Future Core)	Whole Numbers and Multiplication Source: Explorer U.S. System of Measurements Source: Centre for Innovation in Mathematics Teaching Conversion Program Source: Lawrence Goetz Measurements Converter Source: Sergey Gershtein Metric Units and Measurement Source: Math League		Assessment Guidelines: TEKS Mathematics Assessment Connections for Grade 5: Measurement Source: Texas Education Agency Test Items/Worksheet: Calculating Time Source: Balanced Assessment Program Test Items/Worksheet: Cumulative Mathematics Assessment Source: TALKS 2003 Test Prep: Counting Perimeter, Area, and Volume Source: Nicole Carroll	ArtsEdge: How Do Cells Reproduce? Source: MarcoPolo / Kennedy Center NCTM Illuminations: Mathematics and Children's Literature: Lesson 3: Getting the Facts Source: MarcoPolo / NCTM Illuminations NCTM Illuminations: Water, Water Source: MarcoPolo / NCTM Illuminations

Course Name: 5th Grade Mathematics

STRAND: GEOMETRY

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Know the meaning of angles, and solve problems					
Associate an angle with a certain amount of turning, know that angles are measured in degrees; understand that 90 degrees, 180 degrees, 270 degrees, and 360 degrees are associated, respectively, with $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, and full turns.	G.TR.05.01 (Core)	p. 232-236 General Geometry Source: Explorer General Shapes and Dimensions Source: Explorer	Angle, degrees, turn	Test Prep: Angle Measurement Source: Oswego City School District Test Prep: Fifth Grade Word Problems Source: Word Problems for Kids Test Prep: Geometric Figures Source: Sandy Harrison Test Prep: Fifth Grade Word Problems Source: Word Problems for Kids Test Prep: Angle Measurement Source: Oswego City School District	Show a circle with 360 degrees. Mark 90 degrees, 180 degrees, and 270 degrees. Show that they are $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$ turns around the circle. Gold Seal: Building with Polygons Source: ICLE Gold Seal: Enlarging Picture Source: ICLE Gold Seal: Tri-Bar Landscape Source: ICLE Geometry: Tessellations Source: Kathy Peters Hey! What Is Your Angle? Source: Lee Strain
Measure angles with a protractor, and classify them as acute, right, obtuse and straight.	G.GS.05.02 (Core)	p. 234 Animal Olympics Source: Learning Network Apple Facts Source: Michigan State University Extension	Acute, right, obtuse, protractor	Quiz: Right, Acute, and Obtuse Angles Source: Mary Jane Cowell State Released Items: Georgia CRCT Grade 5 Released Item 2002: Mathematics- Computation and Comprehension Source: Georgia Department of Education Test Item: Finding a Missing Angle Source: Oswego City School District	Gold Seal: All Wrapped Up Source: ICLE Gold Seal: Fire Marshall Dilemma Source: ICLE: Janet Peregoy Gold Seal: Going Camping Source: ICLE Gold Seal: Hydroponic Planters Source: ICLE

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STRAND: GEOMETRY

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Know the meaning of angles, and solve problems					
Identify and name angles on a straight line and vertical angles.	G.GS.05.03 (Future Core)	General Geometry Source: Explorer	Vertical angle	NCTM Illuminations: Geometry in the World of Art Lesson 07: Looking Back and Moving Forward Source: MarcoPolo / NCTM Illuminations Test Prep: Angle Measurement Source: Oswego City School District	ArtsEdge: Mandalas and Polygons Source: MarcoPolo / Kennedy Center ArtsEdge: Tribute to Miro Source: MarcoPolo / Kennedy Center Gold Seal: Building with Polygons Source: ICLE Gold Seal: Identification of Angles
Find unknown angles in problems involving angles on a straight line, angles surrounding a point, and vertical angles.	G.GS.05.04 (Future Core)	General Geometry Source: Explorer Introduction to Angles Source: Elizabeth Edwards General Shapes and Dimensions Source: Explorer Geometry Source: Math League	point	Test Prep: Angle Measurement Source: Oswego City School District	Gold Seal: Building with Polygons Source: ICLE Gold Seal: Identification of Angles Source: ICLE

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STRAND: GEOMETRY

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Know the meaning of angles, and solve problems					
Know that angles on a straight line add up to 180 degrees and angles surrounding a point add up to 360 degrees, justify informally by surrounding a point with angles.	G.GS.05.05 (Core)	General Geometry Source: Explorer Introduction to Angles Source: Elizabeth Edwards		Test Prep: Angle Measurement Source: Oswego City School District	Gold Seal: Building with Polygons Source: ICLE Hey! What Is Your Angle? Source: Lee Strain
Understand why the sum of the interior angles of a triangle is 180 degrees and the sum of the interior angles of a quadrilateral is 360 degrees, and use these properties to solve problems.	G.GS.05.06 (Core)	Dave's Math Tables Source: David Manura, Scientific Instrument Services Geometry Junkyard Source: David Eppstein Whole Numbers and Division Source: Explorer	Interior angle, quadrilateral	Assessment Guidelines: Exploring Properties of Rectangles and Parallelograms Using Dynamic Software Source: National Council of Teachers of Mathematics Find the area of rectangles Source: Webmath State Released Items: Illinois Standards Achievement Test Grade 5 Released Item: Mathematics-Computation and Comprehension Source: Illinois State Board of Education	Gold Seal: Building with Polygons Source: ICLE Gold Seal: Class Quilt Pieces Source: ICLE Gold Seal: Pyramid Under Construction Source: ICLE

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STRAND: GEOMETRY

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Solve problems about geometric shapes					
<p>Find unknown angles using the properties of: triangles, including right, isosceles, and equilateral triangles, parallelograms, including rectangles and rhombuses; and trapezoids.</p>	<p>G.GS.05.07 (Future Core)</p>	<p>General Geometry Source: Explorer Introduction to Angles Source: Elizabeth Edwards General Shapes and Dimensions Source: Explorer Geometry Source: Math League</p>		<p>State Released Items: Illinois Standards Achievement Test Grade 5 Released Item: Mathematics-Computation and Comprehension Source: Illinois State Board of Education State Released Items: Kentucky Core Content Test Grade 5 Released Item: Mathematics-Computation and Comprehension Source: Kentucky Department of Education Test Item: Finding a Missing Angle Source: Oswego City School District</p>	<p>Gold Seal: Building with Polygons Source: ICLE Gold Seal: Where in the World Am I? Source: ICLE NCTM Illuminations: Exploring Geometric Solids and Their Properties Lesson 03: Looking for Patterns Source: MarcoPolo / NCTM Illuminations</p>

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Course Name: 5th Grade Math

STRAND: DATA AND PROBABILITY

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Construct and interpret line graphs					
Read and interpret line graphs, and problems with two or three line graphs on the same axes, comparing different data.	D.RE.5.01 (Core)	p. 122-124 newspaper	Line graph, axis	<p><u>Assessment Guidelines: TEKS Mathematics Assessment Connections for Grade 5: Probability and Statistics</u> Source: Texas Education Agency</p> <p><u>State Released Item: Colorado CSAP 2001 Grade 5 Released Item: Mathematics-Computation and Reasoning</u> Source: Colorado Department of Education</p> <p><u>State Released Item: Florida Comprehensive Assessment Test Grade 5 Released Item 2001: Mathematics-Comprehension and Computation</u> Source: Florida Department of Education</p>	<p>Graph temperatures or scores from a newspaper.</p> <p><u>NCTM Illuminations: Beat of Your Heart: Lesson 3: What's the Beat?</u> Source: MarcoPolo / NCTM Illuminations</p> <p><u>NCTM Illuminations: Eat Your Veggies Lesson 04: What Is Your Favorite?</u> Source: MarcoPolo / NCTM Illuminations</p>
Construct line graphs from tables of data; including axis labels and scale.	D.RE.5.02 (Core)			<p><u>Assessment Guidelines: TEKS Mathematics Assessment Connections for Grade 5: Probability and Statistics</u> Source: Texas Education Agency</p> <p><u>State Released Items: Georgia CRCT Grade 5 Released Item 2002: Mathematics-Computation and Comprehension</u> Source: Georgia Department of Education</p>	<p><u>NCTM Illuminations: Eat Your Veggies Lesson 05: Let's Compare</u> Source: MarcoPolo / NCTM Illuminations</p> <p><u>NCTM Illuminations: Food Court Lesson 02: The Soup Spot</u> Source: MarcoPolo / NCTM Illuminations</p> <p><u>NCTM Illuminations: Weather Watchers</u> Source: MarcoPolo / NCTM Illuminations</p>

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STRAND: DATA AND PROBABILITY

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Construct and interpret line graphs					
Given a set of data, find and interpret the mean (using the concept of fair share) and mode.	D.AN.05.03 (Core)	<p>p. 114</p> <p>Gere's Bike Shop-- Data Handling and Interpreting Statistics Source: BBCi</p> <p>Going on a Field Trip Source: Learning Network</p> <p>How Much Does it Cost? Source: Learning Network</p> <p>Math, Baseball and the SF Giants Source: Linda Uhrenholt</p>		<p>NCTM Illuminations: Eat Your Veggies Lesson 08: Looking Back and Moving Forward Source: MarcoPolo / NCTM Illuminations</p> <p>NCTM Illuminations: Food Court Lesson 06: Looking Back and Moving Forward Source: MarcoPolo / NCTM Illuminations</p>	<p>Gold Seal: Goin' Shopping Source: ICLE</p> <p>NCTM Illuminations: Data Collection: Numerical and Categorical Data Lesson 02: Numerical Data Source: MarcoPolo / NCTM Illuminations</p> <p>NCTM Illuminations: Data Collection: Numerical and Categorical Data Lesson 03: Comparing Categorical and Numerical Data Source: MarcoPolo / NCTM Illuminations</p>

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STRAND: DATA AND PROBABILITY

Essential Outcomes/ Standards	Grade Level Content Expectations	Resources	Vocabulary	Assessments	Notes: Suggested Activities
Construct and interpret line graphs					
Solve multi-step problems involving means.	D.AN.05.04 (Future Core)	Cliff-Hanger Source: Nicholas Exner Data Collection Source: Explorer General Probability Source: Explorer Going on a Field Trip Source: Learning Network How Much Does it Cost? Source: Learning Network		NCTM Illuminations: Eat Your Veggies Lesson 08: Looking Back and Moving Forward Source: MarcoPolo / NCTM Illuminations NCTM Illuminations: Food Court Lesson 06: Looking Back and Moving Forward Source: MarcoPolo / NCTM Illuminations Assessment Guidelines: Your Olympic Event Source: Arkansas Smart Start Alignment to Frameworks State Released Item: Alaska Grade 6 Benchmark Test Released Item: Mathematics-Comprehension and Computation Source: Alaska Department of Education State Released Item: Colorado CSAP 2001 Grade 5 Released Item: Mathematics-Computation and Reasoning Source: Colorado Department of Education	Gold Seal: Chances Are Source: ICLE: Janet Peregoy Gold Seal: Fish Tagging Source: ICLE Gold Seal: Graphing Collected Data Source: ICLE Gold Seal: Picnic Lunch Source: ICLE NCTM Illuminations: Consumer Investigations: What is The 'Best' Chip? Source: MarcoPolo / NCTM Illuminations NCTM Illuminations: Data Collection: Numerical and Categorical Data Lesson 02: Numerical Data Source: MarcoPolo / NCTM Illuminations NCTM Illuminations: Data Collection: Numerical and Categorical Data Lesson 03: Comparing Categorical and Numerical Data Source: MarcoPolo / NCTM Illuminations