Subject	Grade	Strand	Big Idea	
Math	6		Rationale, Course Description, Most Important Learner Outcomes, and Evaluation	View
Math	6	Number Sense and Operations	Numbers and operations	View
Math	6	Number Sense and Operations	Fractions	View
Math	6	Number Sense and Operations	Decimals	View
Math	6	Number Sense and Operations	Ratios, Percentages, and Proportions	View
Math	6	Algebraic Relationships	Algebra	View
Math	6	Number Sense and Operations	Integers	View
Math	6	Geometric and Spatial Relationships	Geometry	View
Math	6	Measurement	Measurement	View
Math	6	Data and Probability	Statistics	View
Math	6	Data and Probability	Probability	View

RATIONALE

The primary aim of the sixth grade mathematics program is to equip students with the skills necessary to function effectively in today's rapidly changing world. The program combines problem-solving skills and critical reasoning skills with basic calculation skills to provide the students with a broad base of knowledge from which to draw as they become productive members of society. The program also provides numerous opportunities for the students to practice, apply, and integrate specific skills so that they become independent thinkers and problem solvers. Upon completion, the program allows for an easy transition into the skills of the seventh grade.

COURSE DESCRIPTION

Sixth grade offers a general mathematics course that continues the development of the elementary mathematics program. Applications, problem solving, and critical thinking are integrated throughout the program. Basic computation with whole numbers, fractions, decimals and percents are emphasized. Students will also study measurement (including area, perimeter, and metrics), geometry, probability, and ratios/proportions. The study of algebraic principles including solving of equations lays a strong foundation for future grades. A strong emphasis is placed on data analysis including interpreting and constructing graphs and using measures of central tendencies.

MOST IMPORTANT LEARNER OUTCOMES

Students will be able to:

1. Understand the relationships among numbers, compute fluently, and make reasonable estimates.
2. Acquire a basic understanding of geometric and spatial relationships.
3. Understand and apply the processes of measurement in both the metric and customary systems.
4. Learn to collect, organize, display, and analyze data using appropriate methods
5. Understand basic algebraic relationships and solve simple equations.
6. Apply mathematical concepts and operations to solve standard and nonstandard problems.
7. Understand and apply the concepts of probability.

EVALUATION

Evaluations will be based on unit tests, daily work, journal entries, observation of students during activities, performance events, and yearly standardized testing.

Phelps County R-3	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Sixth Grade
Unit: Number Sense and Operations	**Duration:** 3 weeks
Show-Me Standards Content: MA 1 **Show-Me Standards Process: 1.10, 3.3, 3.6, 4.1**	
Grade Level Expectations: Numbers and Operations: 1A, 1B, 1C, 3C, 3D	
Benchmarks: Understand numbers, ways of representing numbers, relationships among numbers, and number systems. Compute fluently and make reasonable estimates.	**Performance Indicators(Local Objective):** Students will be able to: 1. Compare and order positive rationals, integers, and percents. 2. Locate rationals, integers, and percents on a number line. 3. Recognize and generate equivalent forms of fractions, decimals, and percents. 4. Recognize equivalent representations for the same number, and be able to compose and decompose numbers including expanded notation. 5. Add, subtract, multiply, and divide positive rational numbers. 6. Estimate and justify sums, differences, products, and quotients using rounding.

Activities and Assessments:

1. Students will complete assignments from a sixth grade level textbook as determined by the teacher.
2. Students will keep a Study Guide spiral in which they will record notes from text and vocabulary definitions as assigned by the teacher.
3. Students will keep a Math Lab spiral in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
4. Student Line Up Activity - Give each student in the group a card on which is written an integer, percent, or positive rational number. Students will then compare numbers and line themselves up in the proper order.
5. Human Number Line Activity - Make a number line across the front of the room with paper, yarn, etc. Assign students a given number (rational, integer, or percent) and have each take the appropriate place on the large number line.
6. Equivalent Numbers - Students take turns drawing a card from the word-card pile and placing it face up for the group. Each player will form that number from his/her own set of number cards. First finished wins points.
7. Around We Go Activity - (Rounding) Students form circles of 8-10. First player tosses a bean bag to another player and names a number between 10 and 100. That player must then rename the number by rounding it to the nearest tens place. This may also be done with other place values.
8. Multiplication Properties Activity - Students work in pairs to write the name of a multiplication property on each of five cards. Students then write on separate cards two different examples of that property. Cards are then mixed and another team is challenged to match the examples with the proper property.
9. Math Game. Students are given a deck of cards on which equivalent forms of different numbers

are listed. Cards are turned face down and students take turns turning over two cards at a time to find a match. If no match, turn back over. If match, keep both cards. Student with the most cards in the end wins.
10. Sports Numbers Activity. See Attached. Emphasizes equivalent representations of numbers, decomposing/composing numbers, and working with fractions.
11. Students will have board races to practice addition, subtraction, multiplication, and division of numbers.
14. Students will use sets of multi-sided number cubes to review operations. Working with a partner, each student will roll two cubes. They will then perform an operation predetermined by the teacher with the numbers rolled. Example: Cube one equals 12 and cube two equals 6. The students would multiply to solve the problem 12 x 6.
17. Students will explore virtual activities in the computer lab at the site:
http://nlvm.usu.edu/en/nav/nlibrary.html

Assessments: Chapter test, quizzes, daily work, observations of students during activities to determine understanding, lab entries, performance assessment (Study Island).

Resources:

Math textbook: *Mathematics Applications and Concepts Course 1*, Glencoe

Study Island: www.studyisland.com

Materials: index cards, bean bags, yarn, number cubes, art supplies.

Relevant Links:

http://illuminations.nctm.org
several of the activities
http://nlvm.usu.edu/en/nav/nlibrary.html
Virtual math manipulative.

Phelps County R-3	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Sixth Grade
Unit: Fractions	**Duration:** 5 weeks or more
Show-Me Standards Content: MA 1, 5 **Show-Me Standards Process: 1.10, 3.3, 3.4, 4.1**	
Grade Level Expectations: Numbers and Operations: 1D, 2B, 1B	
Benchmarks: Develop an understanding of fractions by investigating number patterns. Compare, order, add, subtract, multiply, and divide fractions and mixed numbers.	**Performance Indicators(Local Objective):** Students will be able to: 1. Describe the effect of addition and subtraction on fractions. 2. Find the prime factorization of a composite number. 3. Find the greatest common factor of two or more numbers. 4. Express fractions and ratios in simplest form. 5. Express mixed numbers as improper fractions and vice versa. 6. Find the least common multiple of two or more numbers. 7. Compare and order fractions. 8. Add, subtract (including renaming), multiply, and divide fractions and mixed numbers.

Activities and Assessments:

1. Students will complete assignments from a sixth grade level textbook as determined by the teacher.
2. Students will keep a Study Guide spiral in which they will record notes from text and vocabulary definitions as assigned by the teacher.
3. Students will keep a Math Lab spiral in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
4. Match- Up Activity - Students are given a card with improper fractions or their matching mixed number Students then must find their match in the room. Together they must explain why they think they match. This can also be done with equivalent fraction pairs.
5. Sieve of Earthshines - Students use a set of directions and a chart of numbers from 1 - 100. Students will cross out all composite number and will be left with all 25 prime numbers.
6. LCM Spin Off - Form pairs of players. The members of one pair each spin a spinner that is labeled into 6 equal sections with different numbers. The members in the pair compete to be the first to name the LCM of the two numbers. The first member to correctly name the LCM gets one point. Can also be used to find GCF of two numbers.
7. Fraction Placement Game - Students draw an empty fraction or mixed number problem. Boxes are placed where the numbers would normally go. The teacher rolls a die and the students must immediately place the number into a box. After all boxes are filled, the student works his/her problems. The person with the answer with the largest value
8. Recipe Expander - Have students bring a recipe or find one on the internet. They must then multiply the recipe to feed the class.
9. A Lunch-In Affair Activity - See Attached. Emphasizes problem solving, using factors, multiples,

factorization.
10. Customers Cut the Cake Activity - See Attached. Emphasizes use of fractions in every day life wins.
11. The Factor Game - Students use a number grid 1 to 30 or 1 to 49 (see attached) The first player chooses a number and records it on the score list. The opponent then finds all of the factors of the named number and adds them for his score. The numbers are marked from the grid as used and can only be used once.
12. Bandit Math - Cards or tokens are passed out to students. The teacher gives a problem for the class to solve. If a student is called on and has the answer correct, he can "steal" a card/token from another student. At the end of the game, reward students who still have their card/token or the student with the most.
13. What's the Order? - Each pair of students is given a set of cards that shows various stages of a fraction problem. The students have to put the cards in order to show how it would be solved in a logical series They must then explain and justify their choices in their journals.
14. Work and Pass - Teacher gives a problem. The first student writes the problem on a dry erase board and passes it to another student. The second student then adds or subtracts the fraction portion of the problem. A third student then adds or subtracts the whole numbers in the problem. The fourth simplifies the answer. The team with the most correct answers wins.
15. Students will use construction paper of different colors to make equivalent fraction pieces/strips. Students can use these to model equivalent fractions.
16. Students will use fraction tiles to model addition and subtraction of fractions and mixed numbers.
17. Students will use various internet sites to practice working with fractions using virtual manipulative.

Assessments: Chapter test, quizzes, daily work, observations of students during activities to determine understanding, lab entries, performance assessment (Study Island).

Resources:

Math textbook: *Mathematics Applications and Concepts Course 1*, Glencoe

Study Island: www.studyisland.com

Middle Grades Mathematics Project - Factors and

Multiples, Fitzgerald, Winter, Lappan, and Phillips.

Middle Grades Mathematics Project - Similarity and

Equivalent Fractions. Fitzgerald, Winter, Lappan, and Phillips.

Relevant Links:
http://illuminations.nctm.org/LessonDetail
Various lessons.
http://nlvm.usu.edu/en/nav/nlibrary.html
Virtual Manipulatives.

Materials: spinners, index cards, tokens, individual dry-erase boards, construction paper, fraction tiles.

Phelps County R-3	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Sixth Grade
Unit: Decimals	**Duration:** 2 weeks
Show-Me Standards Content: MA 1 **Show-Me Standards Process: 3.3, 3.4, 4.1**	
Grade Level Expectations: Numbers and Operations: 1B, 2B	
Benchmarks: Compare, order, add, subtract, multiply, and divide decimal numbers.	**Performance Indicators(Local Objective):** Students will be able to: 1. Compare and order a set of decimal numbers. 2. Add and subtract decimal numbers. 3. Multiply decimal numbers. 4. Divide decimal numbers by whole numbers and decimal numbers. 5.Describe the effects of addition and subtract on decimal numbers.

Activities and Assessments:

1. Students will complete assignments from a sixth grade level textbook as determined by the teacher.
2. Students will keep a Study Guide spiral in which they will record notes from text and vocabulary definitions as assigned by the teacher.
3. Students will keep a Math Lab spiral in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
4. Coloring Decimals - Students are given a 100 block grid. Then, the teacher gives them directions for coloring certain portions different colors. For example: color 0.2 blue. After several directions have been given leaving only a small portion not colored, students are asked to calculate the part uncolored.
5. Decimal Line Up - Groups are given a set of decimal numbers and are required to place them in the correct order.
6. Decimal Math-O - Students create a grid similar to a bingo card. Students choose decimals from a list provided by the teacher and record them in the grid boxes. The students are given problems to solve, and as the solutions are found, answers on the grid are marked. To win the student must get 5 in a row.
7. Students will have math races at the board.
8. Students will make a journal entry describing the effect of addition and subtraction on decimals. This should include step-by step directions and explanations.
9. Decimal Pool - Students are given a "decimal pool" which is a set of decimal numbers. They must determine which decimals in the pool match a given clue or question. For example, which decimal when rounded to the hundredth place is 0.03?

Assessments: Chapter test, quizzes, daily work, observations of students during activities to determine understanding, lab entries, performance assessment (Study Island).

Resources:

Math textbook: *Mathematics Applications and Concepts Course 1*, Glencoe

Study Island: www.studyisland.com

Relevant Links:

www.aaamath.com/grade6.html
Sixth grade math topics are explained with interactive exercises and problems.

http://math.rice.edu/~lanius/Lessons/
Interactive math lessons

http://nlvm.usu.edu/en/nav/nlibrary.html
Virtual manipulative

Phelps County R-3	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Sixth Grade
Unit: Ratios, Percents, and Proportions	**Duration:**
Show-Me Standards Content: MA 1, 3, 5 **Show-Me Standards Process: 1.8, 3.3**	
Grade Level Expectations: Numbers and Operations: 3E, 1A Data and Probability: 1C	
Benchmarks: Develop an understanding of, and be able to solve, problems using ratios, percents, and proportions.	**Performance Indicators(Local Objective):** Students will be able to: 1. Compare two objects using a ratio. 2. Write rates and find unit rates. 3. Write decimals and ratios as percents and percents as decimals and ratios. 4. Express parts of a whole as percents. 5. Write a proportion to solve a problem. 6. Find a percent of a number. 7. Interpret circle graphs using percents.

Activities and Assessments:

1. Students will complete assignments from a sixth grade level textbook as directed by the teacher.
2. Students will keep a Study Guide spiral in which they will record notes from text and vocabulary definitions as assigned by the teacher.
3. Students will keep a Math Lab spiral in which they will record explanations, justifications, and analysis of activities as assigned by the teacher..
4. Bragging Rights - Students are given problems involving different rates. They then have to figure out who truly has the best rate. For example: Tina says she can buy 12 gallons for $32.40 and Gina says she can buy 15 gallons for $37.50. Who has the better rate?
5. Ratio Hunt - Students will identify advertisements that use ratios in newspapers, internet sites, television ads, etc. For example: 4 out of 5 dentists recommend Crest toothpaste.
6. Having Fun with Baseball Statistics - See attached. Emphasizes conversion of decimals, ratios, and percents and plotting coordinate pairs on a plane.
7. Shopping Mall Math - See Attached. Activities focus on percentages, scale drawings, and problem solving with percents.
8. Measuring Up - What's Your Rate? - See attached. Emphasizes unit rates and proportions.
9. What Do You See? Activity - Students find a picture (or teacher can provide one) of a group of people. They will then write as many fractions, decimals, percents, and ratios as they can to compare members of the group. They will then write a description of the group.
10. Students will use two colors of counters to model ratios and proportions. See Lab Activity pg.342 in *Math Advantage* (Harcourt Brace).
11. Shop til You Drop Activity - Students need game cards and a special cube (See Attached copy). They shuffle the cards and stack them face down. They take turns drawing a card then rolling the cube to
determine the amount of discount. The player then figures the total cost. The amount, if correct, is added to his/her total. First player to reach $150 wins.
12. State Tax Activity - Students use the price of an item they have recently purchased to figure what the cost would have been if they had purchased it in another state. Use a chart of tax amounts found on line.
13. Finding Percent of a Number Lab Activity - Students will use grid paper to model and calculate the percent of a number. See Lab pg 362 in *Math Advantage* (Harcourt Brace).
14. Circle Graph Activity - Students will gather a collection of circle graphs from magazines, newspapers, textbooks, or the internet. In a group, they will analyze and discuss each, listing the percents represented by each division of the graph. They will explain their findings in a journal entry.

Assessments:

Chapter test, quizzes, daily work, observations of students during activities to determine understanding, lab entries, performance assessment (Study Island).

Resources:

Math textbook: *Mathematics Applications and Concepts Course 1*, Glencoe

Study Island: www.studyisland.com

Mathematics Teaching in the Middle School, Robert Quinn

Materials: counters, grid paper, magazines, newspapers

Relevant Links:

http://illuminations.nctm.org
Lesson plans

http://nlvm.usu.edu/en/nav/nlibrary.html
Math Manipulatives.

www.internet4classrooms.com/skill_6th.html
Internet interactive activities and games.

Phelps County R-3	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Sixth Grade
Unit: Algebraic Relationships	**Duration:** 4 weeks
Show-Me Standards Content: MA 2, 4, 5 **Show-Me Standards Process: 1.6, 3.1, 3.6, 4.1**	
Grade Level Expectations: Algebraic Relationships 1B, 1C, 1D, 2A, 2B, 3A, 4A	
Benchmarks: Understand patterns, relations, and functions. Represent and analyze mathematical situations and structures and quantitative relationships using algebraic symbols and models.	**Performance Indicators(Local Objective):** Students will be able to: 1. Represent and describe patterns with tables, graphs, pictures, symbolic rules, or words. 2. Compare various forms of representations to identify a pattern. 3. Identify functions as linear or non-linear. 4. Use variables to represent unknown quantities in expressions. 5. Recognize equivalent forms for simple algebraic expressions. 6. Model and solve problems using multiple representations: graphs, tables, expressions, and equations. 7. Compare situations with constant or varying rates of change. 8. Evaluate expressions using the order of operations. 9. Use powers and exponents in expressions.

Activities and Assessments:

1. Students will complete assignments from a sixth grade level textbook as directed by the teacher.
2. Students will keep a Study Guide spiral in which they will record notes from text and vocabulary definitions as assigned by the teacher.
3. Students will keep a Math Lab spiral in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
3. Operations Puzzles Game- Students are given the value of the expression and numbers in the expression. Students must decide what the operations are to arrive at the value.
4. Operations Mixer Activity - See attached. Focuses on order of operations and problem solving.
5. Inspector X Activity - See Attached. Solving linear equations.
6. Counting Embedded Figures Activity - See Attached. Emphasizes analyzing patterns in problem solving.
7. Bagel Algebra Activity - See Attached. Emphasizes solving problems symbolically.
8. Exploring Linear Data Activity - See Attached. Emphasizes comparison of sets of data, linear relationships, estimating and solving equations.
9. Students will use the computer lab to practice and explore math concepts with virtual manipulative on the http://nlvm.usu.edu/en/nav/vlibrary site. See attached list/menu.
10. In connection with the reading of Number the Stars by Lois Lowry, students will develop a code system that uses algebraic expressions. They will make an input-output table for their secret code and use the table to code a message.
11. Equations for Nutrition Facts Activity - See page 291 in *Math Advantage* textbook. This emphasizes writing equations to show relationships between nutritional ingredients on food labels.
12. The Land Down Under Game - See Attached and pg. 306 of the *Math Advantage Teacher's Guide*. Students will solve problems involving money and temperature relationships and distance, rate, and time relationships.
13. Students will use algebra tiles to model solutions for equations. See *Math Advantage textbook pg* 301.
14. Pay Attention to the Expression Activity - Make two sets of cards, one with algebraic expressions and one with the expressions explained in words. Students will draw cards to make matches.
15. In the computer lab, students will practice completing input-output tables in a spreadsheet program.
16. Students will complete an internet/web-based activity in the lab that emphasizes problem solving strategies. " Searching for Solutions" (see attached)
http://gouchercenter.edu/jcampf/searching for solutions.htm
17. Fun in the Sun Rent-a-Car Activity. See attached. Students will work problems concerning rates and will make graphs, equations, and explanations.
18. A Thousand Lockers Activity. See Attached. Students will apply problem solving skills and math reasoning to solve a complex problem. May be worked on-line at:
http://mathforum.org/alejandre/frisbie/locker.html

Assessments: Chapter test, quizzes, daily work, observations of students during activities to determine understanding, lab entries, performance assessment (Study Island).

Resources:

Math textbook: *Mathematics Applications and Concepts Course 1*, Glencoe
Mathematics Applications and Concepts Course 1, Resource Masters
Study Island: www.studyisland.com
Algebraic Relationships Teaching Aides - DESE

Relevant Links:

http://nlvm.usu.edu/en/nav/nlibrary.html
http://illuminations.nctm.org/LessonDetail
http://gouchercenter.edu/jcampf/searching_for_solutions.
html
http://math.rice.edu/~lanius/Algebra/rentacar.html
http://mathforum.org/alejandre/frisbie/locker.html
Materials: algebra tiles, index cards, nutritional labels.

Phelps County R-3	**Board Approved Date:** **Modification Date:**
Subject: Math	**Class Name:** Math - Sixth Grade
Unit: Integers	**Duration:** 2 weeks
Show-Me Standards Content: MA 5 **Show-Me Standards Process: 3.3**	
Grade Level Expectations: Numbers and Operations: 1A	
Benchmarks: Compare, order, add, subtract, multiply and divide integers.	**Performance Indicators(Local Objective):** Students will be able to: 1. Identify and name integers. 2. Compare and order integers. 3. Add and subtract positive and negative integers. 4. Multiply and divide positive and negative integers.

Activities and Assessments:

1. Students will complete assignments from a sixth grade level textbook as determined by the teacher.
2. Students will keep a Study Guide spiral in which they will record notes from text and vocabulary definitions as assigned by the teacher.
3. Students will keep a Math Lab spiral in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
4. Math Ball - Students toss a ball around with positive and negative numbers sectioned off on the ball. They must perform a predetermined operation (add, subtract, multiply, divide) using the numbers under each thumb.
5. Integer War - A pair of students use a deck of cards (Ace= 1, Jack = 11, Queen = 12, King = O). Black cards are positive and red are negative. Cards are dealt evenly between the two players. Each player turns over two cards and performs the required operation (add, subtract, multiply, divide). The person with the highest number wins all cards.
6. Decimal Snap - A pair of students use a deck of cards (as in integer war). Black are positive and red are negative. Cards are dealt evenly between the two players. Each player turns over one card at the same time. The first player to correctly perform the required operation and call the answer correctly wins both cards.

Assessments: Chapter test, quizzes, daily work, observations of students during activities to determine understanding, lab entries, performance assessment (Study Island).

Resources:

Math textbook: *Mathematics Applications and Concepts Course 1*, Glencoe
Mathematics Applications and Concepts Course 1, Resource Masters
Study Island: www.studyisland.com

Materials: Beach ball (marked accordingly), playing cards.

Relevant Links:

www.nlvm.usu.edu/en/nav/nlibrary.html
Virtual Manipulatives.

http://math.rice.edu/~lanius/Lessons/
Interactive math lessons.

Phelps County R-3	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Sixth Grade
Unit: Geometry	**Duration:** 3-4 weeks
Show-Me Standards Content: MA 2 **Show-Me Standards Process: 1.6, 1.8, 1.10, 3.1, 3.3, 3.4, 3.7, 4.1**	
Grade Level Expectations: Geometric and Spatial Relationships 1A, 1B, 2A, 3A, 3C, 4A, 4B Measurement 1A, 2B	
Benchmarks: Analyze characteristics and properties of two and three dimensional geometric shapes and develop mathematical arguments about geometric relationships Develop spatial reasoning through geometric modeling and visualization.	**Performance Indicators(Local Objective):** Students will be able to: 1. Identify points, segments, rays, and lines. 2. Recognize the relationship between parallel and perpendicular. 3. Classify and measure angles (Acute, obtuse, right, complementary, supplementary) and estimate measurements of 0, 45, 90, 180, and 360 degree angles 4. Name and classify two-dimensional figures. 5. Describe and define lines of symmetry, and create polygons and designs with rotational symmetry. 6. Determine congruency and similarity. 7. Find the area of parallelograms and triangles. 8. Identify three-dimensional figures. (Prisms, pyramids, cones, cylinders, spheres) 9. Use coordinate geometry to construct geometric shapes. 10 Describe polygons and designs using transformations: reflections/flips, rotation/turns, and translations/slides. (Tesselations) 11. Use spatial visualization to identify isometric representations of mat plans. 12. Draw or use visual models to represent and solve problems. 13. Describe relationships between corresponding angles and the length of corresponding sides of similar triangles.

Activities and Assessments:

1. Students will complete assignments from a sixth grade level textbook as determined by the teacher.
2. Students will keep a Study Guide spiral in which they will record notes from text and vocabulary definitions as assigned by the teacher.
3. Students will keep a Math Lab spiral in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
4. Students will build three dimensional figures with toothpicks and marshmallows. Then the student will identify the number of faces, edges, and vertices while naming, comparing, and classifying the figures formed by the sides.
Students will draw geometric figures on waxed paper then fold to determine lines of symmetry.
5. Geometric Scavenger Hunt - Students go on a scavenger hunt around the school grounds to identify geometric shapes in the environment and architecture.
6. Geometric Alien - Students are given a list of features that a geometric alien has, for example: two parallel rays, one pentagon, two perpendicular line segments, three parallelograms, etc. Students must then draw their "alien" that has all of the geometric features.
7. Students will use Geoboards to construct various types of two dimensional figures.
8. Polygon Capture Activity - See Attached.
9. Cubes Everywhere Activity - See Attached.
10. In the computer lab, students will work with math manipulative sites to develop better understanding of geometric concepts. See attached list of sites.
11. Cube Nets - Interactive lesson on nets. http://illuminations.nctm.org/ActivityDetail
12. Students will use a set of 3 dimensional manipulative to take turns identifying the name of each figure.
13. Students will use blocks to build a tower (isometric representation) and then make a mat plan of the tower per teacher instructions. Working with a partner, students will then build models for each other to solve by drawing a mat plan.
14. Students will make a drawing on graph paper then list sets of coordinate pairs needed to make the drawing. Students will trade lists and make the drawings by plotting the points.
15. Students will design tessellations using their choice of transformations.
16. Students will complete problems using models. See attached list of problems.
17. Students will locate examples of angles in the room and estimate the measure of each. Then, they will actually measure to check for accuracy.
18. Students will use the computer manipulative site "Congruent Triangles" to practice similarity and congruency. http://nlvm.usu.edu/
19. Students will use geoboards to shape various parallelograms and triangles. They will then calculate the area of each.

Assessments: Chapter test, quizzes, daily work, observations of students during activities to determine understanding, lab entries, performance assessment (Study Island).

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Resources:

Math textbook: *Mathematics Applications and Concepts Course 1*, Glencoe
Mathematics Applications and Concepts Course 1, Resource Masters
Study Island: www.studyisland.com

Geometric and Spatial Relationships sample problems (DESE) attached

Materials: toothpicks, marshmallows, geoboards, waxed paper, graph paper, blocks, art supplies.

Relevant Links:

http://illuminations.nctm.org/ActivityDetail
Cube Nets Activity, Polygon Capture Activity, Cubes Everywhere Activity.

http://nlvm.edu/en/nav/nlibrary.html
Many virtual math manipulative

http://www.tessellations.org
History of tessellations and how to construct your own.

www.shodor.org/interactivate/activities/tessellate/
Create your own tessellation with computer.

http://illuminations.nctm.org/tools/isometric/isometric.asp
Isometric drawing tool to create drawings

www.hearner.org/channel/courses/teachingmath/grades6
Teaching mat plans. Includes video explanation and samples from students.

Phelps County R-3	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Sixth Grade
Unit: Measurement	**Duration:** 2 weeks
Show-Me Standards Content: MA 2, 5 **Show-Me Standards Process: 1.6, 1.10, 3.1, 3.3, 3.4, 4.1**	
Grade Level Expectations: Measurement: 1C, 2A, 2B, 2C, 2E	
Benchmarks: . Apply appropriate techniques, tools, and formulas to determine measurement. Understand measurable attributes of objects and the units, systems, and processes of measurements.	**Performance Indicator(Local Objective):** Students will be able to: 1. Show relationships among metric units of length. 2. Measure line segments using metric and standard systems. 3. Identify appropriate uses of metric units of mass/weight. 4. Convert units within the metric system and standard system. 5. Add and subtract measures of elapsed time. 6. Estimate a measurement using standard or non-standard units of measurement or benchmarks. 7. Describe how to solve problems involving the area and/or perimeter of polygons.

Activities and Assessments:

1. Students will complete assignments from a sixth grade level textbook as determined by the teacher.
2. Students will keep a Study Guide spiral in which they will record notes from text and vocabulary definitions as assigned by the teacher.
3. Students will keep a Math Lab spiral in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
4. Non-Standard units Activity: Students will be given a paper clip. Working with a partner, students will be asked to measure the length of the classroom. They will then convert "paper clip" to a standard measure. Students will explain in a journal entry their reasoning in deciding how to take the measurements, and describe the results. Students may then be asked to find the width of the room using a non-standard unit of their own choosing.
5. Yard Walk Activity: Students will practice stepping the distance of one yard. They will then estimate how many yards a given distance would be. Then students will actually walk, measure, and compare the actual distance to their estimates.
6. Popsicle Stick: Teacher will demonstrate the difference between millimeter (thickness), centimeter (width), and decimeter (length) using a Popsicle stick. Students will then use the sticks to measure objects in the room.
7. Name that Measure Activity: Students will secretly measure 5 objects in the room using two different units of measure and record the information on index cards. Read the measurements to the class. The first to guess the object wins a point. Bonus points are earned if they can tell which measure is more accurate.
8. Estimate Area: Students will draw an irregular shape on a piece of one inch graph paper. They will then estimate the area in units (squares). Students will trade drawings and repeat the calculations.
9. Area of Expertise Activity: Students are to estimate the area of four rectangular objects in the room. In a chart, record estimates for length, width, and area. Then measure each and calculate actual area. Compare.
10. A Day in the Life Activity: Students work in small groups to develop a chart of a day in the life of a sixth grader. They will record beginning and ending times for daily activities. Calculate the length of each activity and total to see if it equals 24 hours.
11. Cooking Challenge: Students will find a recipe on the internet. They will use the recipe to determine what time they must begin cooking in order to finish at a time given by the teacher. Swap recipes and calculate again with a different completion time.
12. Conversion Concentration: Students will try to match equivalent measures by flipping over two cards. For example: 500 ml and 0.5 liters. Person with most matches wins.
13. Let's Garden Activity: Students are asked to design a garden with at least 6 different areas. They will then calculate the area and perimeter of each section and the entire garden. Trade with another student and calculate again using metric measures. Challenge: calculate the amount of seeds needed to plant the garden or the number of posts in the fence surrounding the garden. Make a journal entry describing how this problem was solved.
14. Students will weigh an object in the room. They will then convert the amount into different units. Example: 2 lbs. to 32 oz. Weigh another item this time using metric measures. Repeat activity.

Assessments: Chapter test, quizzes, daily work, observations of students during activities to determine understanding, lab entries, performance assessment (Study Island).

Resources:

Math textbook: *Mathematics Applications and Concepts Course 1*, Glencoe

Mathematics Applications and Concepts Course 1, Resource Masters

Study Island: www.studyisland.com

Materials: paper clips, meter/yard sticks, Popsicle sticks, index cards, scales.

Relevant Links:

www.amathsdictionaryforkids.com/

Interactive math dictionary

www.sd104.s-cook.k12.il.us/mathlinks.htm

Activities for Measurement and Time

www.aaamath.com/grade6/htm

Sixth grade math practice for most concepts.

http://nlvm.usu.edu/en/nav/vlibrary.html

Virtual math manipulatives

Phelps County R-3	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Sixth Grade
Unit: Statistics	**Duration:** 3 weeks
Show-Me Standards Content: MA 3 **Show-Me Standards Process: 1.2, 1.8, 3.2, 3.5, 3.6**	
Grade Level Expectations: Data and Probability 1A, 1C, 2A, 2B, 3A	
Benchmarks: The students will demonstrate graphing and statistical skills.	**Performance Indicators(local Objective):** Students will be able to: 1. Make and interpret frequency tables. 2. Choose appropriate scales and intervals for different types of graphs and charts. 3. Construct and interpret bar graphs, line graphs, stem-and-leaf plots, histograms, and box plots. 4. Interpret circle and pictographs. 5. Find measures of central tendency: mean median, mode, and range to describe a set of data. 6. Use ordered pairs to locate points on a graph. 7. Develop and evaluate inferences and predictions that are based on data. 8. Formulate questions, design studies, and collect data about a characteristic. 9. Compare different representations of the same data and evaluate how well each representation shows important aspects of the data. (types of graphs, etc) 10. Use observations about differences between two samples to make conjectures about the populations from which the samples were taken.

Activities and Assessments:

1. Students will complete assignments from a sixth grade text book as determined by the teacher.
2. Students will keep a Study Guide spiral in which they will record notes from text and vocabulary definitions as assigned by the teacher.
3. Students will keep a Math Lab spiral in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
4. Which Graph? - Students are given a topic such as average monthly temperatures, and they determine what type of graph would be best to use to display the information.
5. Students think of a topic and practice organizing and collecting data from their classmates. Then they will use the data sets to create graphs and charts.
6. Data Detective - Students are given an incomplete list of data. Clues will give information about the mean, median, mode, or range of the data. Students must then decide what the missing data items are. For example: the clue is that the mean is 18 and the data is 12, 17, 18, 19, 19, and ????.
7. Bean Activity: Groups of students are given a bowl of beans. One at a time the students take turns grabbing a handful of beans, counting, and recording the amount. Each group then calculates the mean, median, mode, and range of the results.
8. Battleship: The teacher locates a secret ship on a coordinate plane. The students try to locate the ship by guessing ordered pairs.
9. Students will create and design pictures using coordinate pairs.
10. Students will play the baseball statistics game using coordinate pairs. (See attached directions.)
11. Analyzing graphs: Students are given various graphs of information. They will check for appropriate labeling, misleading information, and any predictions or inferences that can be made from the graph.
12. Make your own combo: Students are given a task, like flipping two coins, selecting ice cream flavors, or choosing from a menu. The students are then asked to create a tree diagram and a list of all the possible combinations.
13. Jelly Bean Jostle: Students will use this activity to predict population size from an average of samples.
(See Attached Instructions.)
14. Capture-Recapture Activity: Use goldfish crackers to symbolize fish in a pond. Three fourths should be gold and about one fourth a different color (represents tagged fish). Ahead of time count amount of each. Have each student take a "sample" and count both types of crackers. Solve a proportion to find the total number of fish in the population.
15. Roll the Dice: In partners, students roll a pair of dice. One die is the tens digit and the other is the ones digit. Students collect a set of 20 numbers then graph the data on a stem-and-leaf plot.
16. Human Box and Whisker Plot: See Attached.
17. Students will make journal entries describing and explaining activities selected by the teacher.

Assessments: Chapter test, quizzes, daily work, observations of students during activities to determine understanding, lab entries, performance assessment (Study Island).

Resources:

Math textbook: *Mathematics Applications and Concepts Course 1*, Glencoe

Mathematics Applications and Concepts Course 1, Resource Masters

Study Island: www.studyisland.com

Graphs from various newspapers, magazines, internet.

Mathematics in a World of Data, Burrill, Clifford, Errthum, Kranendonk, Mastromatteo, and O'Connor

Dealing with Data and Chance (NCTM), Judith S. Zawojewski

Exploring Statistics in the Elementary Grades, Bereska, Bolster, Bolster, and Scheaffer

Middle Grades Mathematics Project - Probability, Phillips, Lappan, Winter, and Fitzgerald

Exploring Data, Landwehr and Watkins

Materials: dried beans, gold fish crackers, number cubes, graph paper.

Relevant Links:

www.aaamath.com/grade6 Sixth grade math topics are explained with interactive exercises and problems.

www.mathforum.org/cgraph/cplane Coordinate plane graphing activities.

www.pbskids.org/cyberchase/games/estimation/index.html Jelly Bean Jostle Activity

www.illuminations.nctm.org/ActivityDetail Bar grapher, circle grapher, box plotter, histogram tool

http://nces.ed.gov/nceskids/graphing Create a graph

http://nlvm.usu.edu Virtual Manipulatives

Phelps County R-3	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Sixth Grade
Unit: Probability	**Duration:** 2 weeks
Show-Me Standards Content: MA 3, 6 **Show-Me Standards Process: 3.2**	
Grade Level Expectations: Data and Probability 4A	
Benchmarks: Understand and apply basic concepts of probability.	**Performance Indicators(Local Objective):** Students will be able to: 1. Use a model or simulation to illustrate the possible outcomes of an event. 2. Find mathematical and experimental probability and express as a fraction, decimal, or percent.

Activities and Assessments:

1. Students will complete assignments from a sixth grade level textbook as determined by the teacher.
2. Students will keep a Study Guide spiral in which they will record notes from text and vocabulary definitions as assigned by the teacher.
3. Students will keep a Math Lab spiral in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
4. It's Probably Mr. Wolf Activity: See attached instructions. Conduct a probability experiment, analyze and interpret data, predicting, finding an average.
5. ESP Activity: See attached instructions. Students use cards with four symbols to conduct a probability experiment.
6. Roll the Dice Activity: Students will work with a partner and roll a die twenty times. Outcomes will be recorded on a frequency chart. Students will then calculate mathematical and experimental probability for each possible outcome. Answers will be expressed as a fraction, decimal, and percent.
7. Spinner Activity: Activity is conducted same as #4 above except students spin a spinner instead of rolling dice.
8. Juice Drink Simulation: A juice company is having a contest. To win a prize, you have to collect six bottle caps that spell out ORANGE. One of the six letters is put under each bottle cap when the cap is produced. The letters are divided equally among the juice bottles. Students will conduct an experiment to simulate how many bottles of juice you have to buy to get all six letters. (See Pg. 278 Math Advantage Harcourt Brace)

ASSESSMENTS: Chapter test, quizzes, daily work, observations of students during activities to determine understanding, lab entries, performance assessment (Study Island).

Resources:

Math textbook: *Mathematics Applications and Concepts Course 1*, Glencoe

Mathematics Applications and Concepts Course 1, Resource Masters

Study Island: www.studyisland.com

Mathematics in a World of Data, Burrill, Clifford, Errthum, Kranendonk, Mastromatteo, and O'Connor

Middle Grades Mathematics Project-Probability, Phillips, Lappan, Winter, and Fitzgerald

Relevant Links:
www.aaamath.com/grade6

http://nlvm.usu.edu/en/nav/vlibrary.html
Virtual math manipulative.

Materials: index cards, number cubes, spinners.