Subject	Grade	Strand	Big Idea	
Math			Rationale, Course Description, Most Important Learner Outcomes, and Evaluation	View
Math	5	Number Sense and Operations	Number Sense and Operations	View
Math	5	Algebraic Relationships	Algebraic Relationships	View
Math	5	Geometric and Spatial Relationships	Geometric and Spatial Relationships	View
Math	5	Measurement	Measurement	View
Math	5	Data and Probability	Data and Probability	View

RATIONALE

The basic activities in a good mathematics program afford students the opportunity to combine a variety of problem-solving skills with a thorough knowledge of mathematical calculation abilities. The fifth grade math program is developed to help students learn, practice, apply and integrate into other areas of study, specific skills so that they can become independent learners and thinkers.

COURSE DESCRIPTION

The fifth grade mathematics program is designed to promote and enhance problem-solving skills while continuing to build upon and furthering the student's calculation abilities. This course establishes a firm foundation in the basic calculation skills of addition, subtraction, multiplication and division. This program furthers these skills by introducing new concepts in fractions, probability, geometry, and statistics. Students learn to apply these basic skills to problem-solving activities, which enhance critical thinking skills, and allow students to broaden their perspectives of mathematics into other academic areas.

MOST IMPORTANT LEARNER OUTCOMES

Students will be able to:

1. Understand numbers, methods of representing numbers, relationships among numbers.
2. Analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships.
3. Understand measurable attributes of objects and the units, systems, and processes of measurement.
4. Select and use appropriate statistical methods to analyze data.
5. Use mathematical models to represent and understand quantitative relationships.

EVALUATION

Fifth grade students are evaluated by teacher observation of students during group activities, individual student projects, adopted text assessment, resource material, oral presentations, and online assessments.

Phelps County R-3 School	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Fifth Grade
Unit: Number Sense and Operations	**Duration:** 3 weeks
Show-Me Standards Content: MA 1, 5 **Show-Me Standards Process: 1.4, 1.6, 1.10, 3.3, 3.4, 3.6, 4.1**	
Grade Level Expectations: Numbers and Operations: 1A, 1B, 1C, 1D, 2A, 2B, 2C, 3A, 3C, 3D	

Benchmarks:

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Compute fluently and make reasonable estimates.

Understand meanings of operations and how they relate to one another.

Performance Indicators(Local Objective):

1. Read, write, and compare decimals to the hundredths place and whole numbers up to 6 digits.
2. Describe numbers according to their characteristics including whole number factors, prime/composite, odd/even, and square number.
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.
5. Add, subtract, multiply, and divide positive rational numbers.
6. Estimate and justify sums, differences, products, and quotients using rounding.
7. Recognize and represent division using various models including quotative and partitive.
8. Describe the effects of multiplying and dividing whole numbers as well as the relationship between the two operations.
9. Apply the distributive and associative properties to whole numbers.
10. Add and subtract fractions and mixed numbers.

Activities and Assessments:

1. Students will complete assignments from a fifth grade level textbook as determined by the teacher.
2. Students will keep a math Journal in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
3. Student Line Up Activity - Give each student in the group a card on which is written a whole number or decimal number. Students will then compare numbers and line themselves up in the proper order.
4. Human Number Line Activity - Make a number line across the front of the room with paper, yarn, etc. Give each student a card with a number and the student will stand at the proper place on the line.
5. Equivalent Numbers - Make cards with the written form of the number on one and the numerical form on another. 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.
6. 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.
7. 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.
8. 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.
9. Students will use manipulative to model division problems.
10. Sieve of Eratosthenes - 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. http://www.hbmeyer.de/eratosiv.htm for interactive Sieve.
11. Students will make a poster to display and explain the effects of multiplying and dividing numbers how the two operations are related.
12. Too Big or Too Small? Activities. See Attached. Three activities that emphasize understanding the meaning and effect of arithmetic operations and developing strategies to estimate and justify the results of rational number operations.
13. Students will have board races to practice addition (single), subtraction(double), multiplication (triple), and division(home run) of numbers. (Math Baseball)
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.
15. Washing Dishes Activity - See Attached. Emphasizes estimation, patterns, powers of two, and expressing mathematical ideas.
16. Students will explore virtual activities in the computer lab at the site: http://nlvm.usu.edu/en/nav/nlibrary.html
17. Ideas with Food Activities: See attached. Emphasis on problem solving, measuring, and division properties.
18. 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 add them for his score. The numbers are marked from the

grid as used and can only be used once.

19. Students will use fraction tiles to model addition and subtraction of fractions.
20. Students will make a set of fraction strips and will use it to model equivalent fractions.
21. Students will use the internet to practice fraction skills at the following sites:
    www.visualfractions.com
    http://fen.com/studentactivities/MathSplat/mathsplat.htm
22. Who Wants Pizza? activity site: http://math.rice.edu/~lanius/fractions/(See attached table of contents).

Assessments:

Unit test, daily work, journals, observation of activities
for student understaning.

Resources:

Math textbook: *Math* Macmillan/McGraw-Hill

Math Word Problems, Daily Practice, Grade 5. SmartBoard Interactive Tool. Teacher Created Resources.

Spectrum Math, Grade 5. Spectrum. Carson-Dellosa Publishing LLC. Chps. 1-8

Middle Grades Mathematics Project - Similarity and Equivalent Fractions. Lappan, Fitzgerald, Winter, and Phillips.

Real Life Math, Nancy Belsky

Materials: Bean bags, index cards, counters/pattern blocks (small pieces), number cubes, fraction tiles.

Relevant Links:

www.aaamath.com Interactive practice broken down by grade level and objective
www.math-aids.com Practice problems and printable practice by topic
http://exchange.smarttech.com/#tab=0 SmartBoard Lesson templates and already created lessons
http://illuminations.nctm.org Several of the activities
http://nlvm.usu.edu/en/nav/nlibrary.html Virtual math manipulatives

Phelps County R-3 School	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Fifth Grade
Unit: Algebraic Relationships	**Duration:**
Show-Me Standards Content: MA 4, 5 **Show-Me Standards Process: 1.6, 3.1, 3.6, 4.1**	
Grade Level Expectations: Algebraic Relationships 1A, 1B, 2A, 2B, 3A, 4A	
Benchmarks: Understand patterns, relations, and functions. Represent and analyze mathematical situations and structures using algebraic symbols. Use mathematical models to represent and understand quantitative relationships. Analyze change in various contexts.	**Performance Indicators(local Objective):** **1.** Make and describe generalizations about geometric and numeric patterns. **2.** Represent and analyze patterns using words, tables, and graphs. **3.** Represent a mathematical situation as an expression or number sentence using a letter or symbol. **4.** Apply the distributive and associative properties **5.** to whole numbers. **6.** Model problem situations and draw conclusions, **7.** using representations such as graphs, tables, or **8.** number sentences. **9.** Identify, model, and describe situations with constant or varying rates of change.

Activities and Assessments:

1. Students will complete assignments from a fifth grade level textbook as determined by the teacher.
2. Students will keep a Math Journal in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
3. 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
4. Students will create a pattern using pattern blocks manipulative. Another student will then try to repeat the pattern.
5. Petals Around the Rose Activity: (see attached). Emphasis on problem solving and patterns.
6. What Comes Nex_? Activity: See attached. Emphasis on patterns.
7. Students will model the properties of multiplication with manipulatives.
8. Students will think of real life math situations and will make expressions or number sentences from the information.
9. Given a number sentence/expression, students will make up word problems. They will trade and solve.
10. Students will draw pictures to model math problems.
11. Students will gather information such as weather date and graph over a period of time. They will then analyze the rates of change over the period of time observed.
12. Students will use the internet to practice skills with virtual manipulative.
http://nlvm.usu.edu/en/nav/nlibrary.html

Assessments:
Unit test, daily work, observation of students during activities for understanding, drawings, journals.

Resources:

Math textbook: *Math* Macmillan/McGraw-Hill

Math Word Problems, Daily Practice, Grade 5. SmartBoard Interactive Tool. Teacher Created Resources.

Spectrum Math, Grade 5. Spectrum. Carson-Dellosa Publishing LLC. Chp. 13

Factors and Multiples by Fitzgerald, Winter,
Lappan, and Phillips

Materials: Counters, pattern blocks, art supplies.

Relevant Links:
www.aaamath.com Interactive practice broken down by grade level and objective
www.math-aids.com Practice problems and printable practice by topic
http://exchange.smarttech.com/#tab=0 SmartBoard Lesson templates and already created lessons
http://illuminations.nctm.org lesson plans
http://nlvm.usu.edu/en/nav/nlibrary.html virtual math manipulatives

Phelps County R-3 School	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Fifth Grade
Unit: Geometric and Spatial Relationships	**Duration:**
Show-Me Standards Content: MA 2 **Show-Me Standards Process: 1.5, 1.6, 1.8, 3.3, 3.6, 4.1**	
Grade Level Expectations: Geometric: 1A, 1C, 2A, 3A, 3C, 4A	
Benchmarks: Analyze characteristics and properties of two-and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships. Specify locations and describe spatial relationships using coordinate geometry and other representational systems. Apply transformations and use symmetry to analyze mathematical situations. Use visualization, spatial reasoning and geometric modeling to solve problems.	**Performance Indicators(Local Objective):** 1. Analyze 2 and 3 dimensional shapes by describing attributes. 2. Predict and justify the results of subdividing combining, and transforming shapes. 3. Use coordinate system to specify locations, describe paths and find the distance between points along horizontal and vertical lines. 4. Predict, draw, and describe the results of 5. sliding, /translating, flipping/reflecting, and turning/rotating around a center point of a polygon. 6. Identify polygons and designs with rotational symmetry. Identify three dimensional shapes from a net of a prism or cylinder.

Activities and Assessments:

1. Students will complete assignments from a fifth grade level math textbook as determined by the teacher.
2. Students will keep a Math Journal in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
3. Collect pictures from a variety of sources like magazines and label and describe the polygons found in the pictures.
4. Use toothpicks or geoboards to create shapes and angles.
5. Students will use tangrams to create shapes and make transformations.
6. Students will find pictures (faces, flowers, etc.) from magazines and cut it in half. They will redraw the other half using symmetry.
7. Students will make a Christmas tree by folding paper in half and cutting out the shape. They will then decorate it using reflection/symmetry.
8. Students will create treasure maps using coordinates. They will then determine the distance between points using a scale.
9. Students will cut out mats/nets of polygons and put them together to make three dimensional shapes.
10. Students will design a quilt using transformations and rotational symmetry.
11. Students will make a mind map depicting the relationships and attributes of two and three dimensional shapes.
12. 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.
13. In the computer lab, students will work with math manipulative sites to develop better understanding of geometric concepts. See attached list of sites.
14. Cube Nets - Interactive lesson on nets. http://illuminations.nctm.org/ActivityDetail

Assessments:
Unit tests, journals, observation of students during activities to determine understanding, daily work.

Resources:

Math textbook: *Math* Macmillan/McGraw-Hill

Math Word Problems, Daily Practice, Grade 5. SmartBoard Interactive Tool. Teacher Created Resources.

Spectrum Math, Grade 5. Spectrum. Carson-Dellosa Publishing LLC. Chp. 12

Relevant Links:
www.aaamath.com Interactive practice broken down by grade level and objective
www.math-aids.com Practice problems and printable practice by topic
http://exchange.smarttech.com/#tab=0 SmartBoard Lesson templates and already created lessons
http://nlvm.usu.edu/en/nav/library.html Virtual Math Manipulatives.
www.hearner.org/channel/courses/teachingmath/grades6 Teaching mat plans. Includes video explanation and samples from students.
www.shodor.org/interactivate/activities/tessellate/ Create your own tessellation with computer.

Materials: Magazine pictures, toothpicks, geoboards, marshmallows, tangrams.

Phelps County R-3 School	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Fifth Grade
Unit: Measurement	**Duration:**
Show-Me Standards Content: MA 2 **Show-Me Standards Process: 1.6, 1.10, 3.1, 4.1**	
Grade Level Expectations: 1A, 1B, 1C, 2C, 2E,	
Benchmarks: Understand measurable attributes of objects and the units, systems, and processes of measurement. Apply appropriate techniques, tools, and formulas to determine measurements.	**Performance Indicators(Local Objective):** 1. Identify and justify the unit of measure for area. 2. (Customary and metric) 3. Identify the equivalent weights and capacities within a system of measurement. 4. Solve problems involving elapsed time (hours). 5. Describe how to solve problems involving the area of polygons and non-polygonal regions imposed on a rectangular grid. 6. Convert from one unit to another within a system of measurement (linear).

Activities and Assessments:

1. Students will complete assignments from a fifth grade level textbook as determined by the teacher.
2. Students will keep a math Journal in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
3. Using samples of flight schedules, students will determine elapsed time by calculating trips to different places within the country and world.
4. Students will bring cans and boxes from home and use them to calculate volume and capacity. They will then compare the results with what is written on the container.
5. Use a time zone chart to determine the time differences across the U.S.
6. Students will use geoboards to construct polygons and irregular shapes. They will then calculate area and explain how they solved the problem.
7. Students will work in pairs with graph paper and draw polygons on the paper. They will then trade papers and calculate the area.
8. Gallon Man Activity - Students will construct a "man" as follows: body = gallon, arms = quarts, fingers = pints.
9. Students will measure different items in the room in centimeters and then determine the equivalent amount of millimeters or meters etc. Repeat the activity using customary measures.
10. Students will use the computer to explore measurement concepts with virtual manipulative. http://nlvm.usu.edu/en/nav/nlibrary.html
11. Think - Pair - Share Activity. Use attached Measurement Task Cards. Give each pair of students a card and have them think about an answer. Then, the partners will share their answers and come up with a final answer.
12. How Long? Activity. See attached. Emphasis on historical nonstandard units and standard equivalents.

Assessments:

Unit test, daily work, observation of students during activities to determine understanding, journals

Resources:

Math textbook: *Math* Macmillan/McGraw-Hill

Math Word Problems, Daily Practice, Grade 5. SmartBoard Interactive Tool. Teacher Created Resources.

Spectrum Math, Grade 5. Spectrum. Carson-Dellosa Publishing LLC. Chps. 9-10

Materials: rulers (meter sticks), geoboards, graph paper, flight schedules, time zone charts, art supplies, construction paper.

Relevant Links:

www.aaamath.com Interactive practice broken down by grade level and objective
www.math-aids.com Practice problems and printable practice by topic
http://exchange.smarttech.com/#tab=0 SmartBoard Lesson templates and already created lesson
http://illuminations.nctm.org Activities

Phelps County R-3 School	**Board Approval:** **Modification Date:**
Subject: Math	**Class Name:** Math - Fifth Grade
Unit: Data and Probability	**Duration:**
Show-Me Standards Content: MA 3 **Show-Me Standards Process: 1.2, 3.1, 3.6, 4.1**	
Grade Level Expectations: Data/Probability: 1A, 1C, 2A, 2B, 3A, 4A	
Benchmarks: Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them. Select and use appropriate statistical methods to analyze data. Develop and evaluate inferences and predictions that are based on data. Understand and apply basic concepts of probability.	**Performance Indicators(Local Objective):** 1. Describe the degree of likelihood of events using such words as certain, equally likely, and impossible. 2. Make and justify predictions about a given set of data. 3. Compare related data sets. 4. Compare different representations of the same data and evaluate how well each shows important aspects of the data 5. Evaluate data collection methods. 6. Describe methods to collect, organize, and represent categorical and numerical data.

Activities and Assessments:

1. Students will complete assignments from a fifth grade level textbook as determined by the teacher.
2. Students will keep a Math Journal in which they will record explanations, justifications, and analysis of activities as assigned by the teacher.
3. Bias Sampling Activity - See attached Emphasis on types of sampling and bias.
4. Students will use the interactive activity called "Marble Mania" on line to conduct probability experiments. http://www.sciencenetlinks.com/interactives/ marble/marble mania.html
5. Coin Flip Activity - Students will work with a partner and flip a coin 50 times recording each result on a table. Students will then calculate probability.
6. Given the same set of data, students will work in groups to make graphs. Each group will make a different type of graph, for example: bar graph, line plot, stem and leaf plot, histogram, etc. The class will discuss the different graphs and analyze which would be the best to represent the data set and why.
7. Students will make a graphic organizer to illustrate different ways to collect data.
8. Students will use the internet, magazines, or books to collect examples of graphs. Working in a small group, discuss and evaluate a graph and make predictions about the data.
9. Students will conduct a survey and using the data collected, will construct appropriate graphs. They will then analyze the graphs and write descriptions and make predictions. All information will be presented on a poster including a description of how the study was conducted.

Assessments:

Unit test, daily work, observation of students during activities to check for understanding, journals, project rubric/scoring guide.

Resources:

Math textbook: *Math* Macmillan/McGraw-Hill

Math Word Problems, Daily Practice, Grade 5. SmartBoard Interactive Tool. Teacher Created Resources.

Spectrum Math, Grade 5. Spectrum. Carson-Dellosa Publishing LLC. Chp. 11

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

Materials: Coins, graph paper, art supplies.

Relevant Links:

www.aaamath.com Interactive practice broken down by grade level and objective
www.math-aids.com Practice problems and printable practice by topic
http://exchange.smarttech.com/#tab=0 SmartBoard Lesson templates and already created lesson
http://www.sciencenetlinks.com/interactives/marble/marblemani.html Interactive probability tools
http://nlvm.usu.edu/en/nav/nlibrary.html Virtual math manipulative.