Once Upon a Math Lesson….
Everyone Had Fun!

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Goals and Objectives

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Goals

The primary goal of Once Upon a Math Lesson…Everyone Had Fun is to create interdisplinary units that highlight different examples of children's literature which focus on mathematical concepts. When literature and other subjects are tied to mathematics then, PRESTO, the lesson becomes fun for everyone! Researchers say that mathematics is a major point of anxiety for many students in elementary school; Thoughts like "I am not good in math" or "I'll never be able to figure this out" cross the minds of at least ¼ of classroom students.

This integration of mathematics with literature and other subjects helps to connect the real world with many abstract mathematical concepts. When students can visualize the whys and hows of mathematics, they find a purpose and a reason for such an abstract subject.

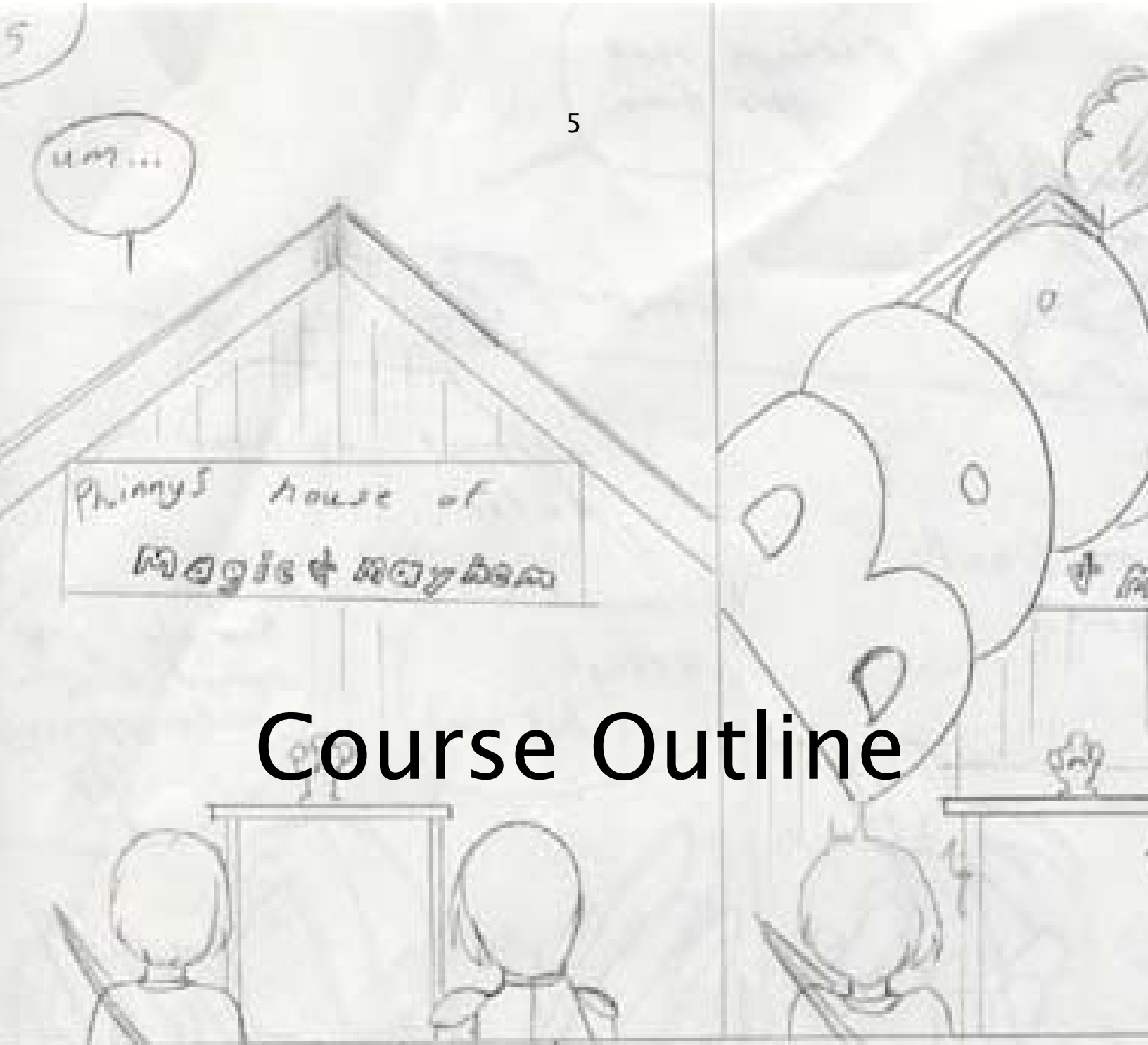
Objectives

Language Arts:

1.1. A: Demonstrates an understanding of story elements/structure: setting, characters, problem/goal, events, resolution: compares and contrasts characters and setting in two or more selections.
1.6. A: Sets purpose for reading and makes predictions by relating new information to prior knowledge, previewing illustrations and scanning texts.
1.7. A: Reads, identifies and understands key vocabulary words and concepts encountered in instruction
1.17. A: Recognizes recurring themes in literature.

Mathematics:
NCTM Standards 1,6,7,8: To use place value to express, compare, and order whole numbers
NCTM Standards 1,6,8: To estimate sums, differences, products and quotients
NCTM Standards 5,6,7,8,9,10: To record and organize data collected in a survey
NCTM Standards 5,6,8: To draw conclusions by analyzing data in tables and graphs
NCTM Standards 3,6,7,8,10: To use polygons to make tessellations and to create new figures

NCTM Standards 1,2,3,4,6,8: To find the perimeter of a polygon and the circumference of a circle



Course Outline

Course Outline

Once Upon a Math Lesson…Everyone Had Fun is an interdisplinary unit that can be implemented throughout the entire school year. Through this unit of study, the different mathematical strands will be represented by five selections of

children's literature. These stories will introduce the students to the concepts that they will be learning during that particular time.

Originally this unit was created in order to integrate as many subject areas as possible. For example at my school, E.D. Hirsch CORE Knowledge is used in every classroom. I used these resources and was able to introduce information about the Middle Ages. Using books written by Cindy Neuschwander (The Sir Cumference Series), students acquired facts such as; knights, castles and manors.

Course Outline

1st 9 Weeks Number Sense and Operations: Read stories such as The King's Commissioners, The King's Chessboard, Place for Zero and How Much is a Million.

- Discuss the value of digits and their special place with in each period of large numbers
- Manipulative Activity: Using base ten blocks and a die. Pairs will take turns rolling the die and placing a digit in a place value slot. The object of the game in to come closets to 100,000. The student that comes closest wins that round.
- Coordinate Castle Maps: After discussing castle and their parts the students use graph paper to create a map of a castle and assign coordinate to the different parts in the key.

2nd 9 Weeks Measurement: Read stories like Sir Cumference and the Dragon Pi, Grandfather Tang's Story and The Librarian that Measured the Earth.

- Discuss folklore, fables, myths, folktales, etc… The students will learn how these stories are based on a particular moral.
- Discuss Area and Perimeter. Students will learn how to measure to find each and how to calculate the total.
- After reading Grandfather Tang's Story, the students will use tangrams to create their own "tangram animal." They will calculate the perimeter using a ruler and then the area using pattern blocks.
- Science: Discussion into the different types of animals.
- Students will also create their own folktale. Students will write and illustrate their folktale in a step book format. The construction of the step booklet requires estimation and measurement skills.

3rd 9 Weeks Geometry: Read stories like The Greedy Triangle, Sir Cumference and the First Round Table and Arrow to the Sun.

- Discuss polygons (closed figures with 3 or more sides) and the characteristics of the different examples within each story.
- Creative Writing: Comic Strip "The Adventures of Poly Gon" The class will discuss ideas as to what Poly Gon looks like and what type of superhero she is- the special powers she possesses. The students will proceed to write and illustrate a comic strip for Poly Gon.

4th 9 Weeks Data Analysis and Statistics/Algebraic Thinking: Read stories like M&M Math, More M&M Math, Math Curse and Grapes of Math.

- Read story More M&M Math (Level Two)
- Each student will receive an M&M bag of candies.
- The students will follow directions and make mathematical arrangements such as; tally charts, bar graphs, arranging numbers in ordinal positions, and computing multiplication and division problems.
- Read Math Curse and construct a Math Curse Diary.
- In this diary students will explain the sequence of the story and draw diagrams or figures to try to solve math problems for each part of the character's day.
- Compare and Contrast: The students will use paper plates to construct a venn diagram that contrast and compares the main character of the story and themselves. How are their days and activities the same or different?
- Read Grapes of Math and the students will write and illustrate their own poetry related to mathematics and numbers

Lesson Plans

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Lesson Plans

Lesson Plans # 1: Number Sense/Operations (Concepts)

Preparation: Have at least one copy of the following books; The King's Commissioners and The King's Chessboard; books or magazines about castles and manors, graph paper, crayons, markers and scissors.

Objectives:

1. The student will learn the value of digits and their special place within each period of large numbers.
2. The student will be able to round large numbers to the thousands, millions and billions.
3. The student will be able to read coordinate grids and create their own map using coordinates.
4. The student will be able to label and identify the different parts of a Medieval Castle/Manor.

Materials: Copies of the above mentioned books, graph paper, constructions paper, crayons, markers, scissors and glue.

Activity: The students will be exposed to books that correlate the Middle Ages and mathematical concepts (coordinates, grouping, place value, etc…) afterwards; the students will create a map of a castle

(Medieval manor). The students will assign coordinates for each part of their map. Color/Decorate and develop a key.

Home learning: The students will be able to complete extra practice reading coordinate grids and coordinate pairs.

Evaluation: Teacher observation

Lesson Plan # 2 Measurement with a Thematic Connection to Science

Preparation: Have at least one copy of Grandfather Tang's Story, rulers, tag board, scissors and tangrams (store bought or student-made).

Objectives:

1. The students will be able to identify the different types of animals created within the story.
2. The student will be able to use concrete manipulatives (tangrams) in order to create their own animal not illustrated in the story. This animal may be specific to the curriculum that the teacher is covering in class. For example, invertebrates, vertebrates, species specific to Florida, etc…

3. The student will be able to use standard units of measure (ruler with inches/centimeters) and non-standard units of measure (pattern blocks) in order to calculate the perimeter and area of their animal.

Materials: Grandfather Tang's Story, tag board, rulers, scissors, crayons, markers, pattern blocks.

Activity: Read the story Grandfather Tang's Story and identify all of the animals created in the story. Graph them on a class bar graph in order to divide them into the animal classifications. Pass out the tag board, rulers and instructions to make their own tangrams (this can be substituted for store bought tangrams). Students will use these tangrams in order to create an animal with the seven tangram pieces. They will color/decorate.

The next step in the activity is for the students to use a ruler (standard) to measure the sides of their animal and calculate the perimeter of this animal. Lastly, the students will use pattern blocks

(non-standard) in order to fill in their animal and be able to calculate the area.

Home Learning: The students will write a narrative piece about an adventure with their animal.

Evaluation: Teacher observation, participation and final product

Lesson Plan # 3 Geometry with a thematic connection to Language Arts and Creative Writing

Preparation: At least one copy of the book The Greedy Triangle, sentence strips, crayons and markers

Objectives:

1. The student will be able to differentiate between a polygon

2. The student will be able to group a regular polygons and irregular polygons together.
3. The student will be able to list all the characteristics of the polygons in the story.
4. The student will be able to create a comic strip using dialogue

Materials: The Greedy Triangle, sentence strips, crayons, markers, butcher paper.

Activity: Read the story, The Greedy Triangle with the students. Identify all of the shapes in the story. Define a polygon (closed figure with three or more sides). As a class activity, show the students different regular polygons and irregular polygons and place them on butcher paper for further reference.

As a culminating activity, introduce “Poly Gon” as a mathematical superhero. The students will then use sentence strips to write and illustrate a comic strip for Poly Gon using dialogue and other literary devices.

Home Learning: Students can make a 3-D model of their superhero Poly Gon

Evaluation: Teacher observation, participation, and final products.

Lesson Plan #4 Algebraic Thinking/Data Analysis and Statistics

Preparation: At least one copy of the following books, M&M Math, More M&M Math, Math Curse and Grapes of Math. Construction paper, crayons, markers and scissors.

Objectives:

1. The student will be able to find patterns and connection in mathematics.
2. The student will be able to follow directions and make mathematical arrangements such as; tally charts, bar graphs, arranging numbers in ordinal positions, and computing multiplication and division problems.
3. The student will be able to create and keep a log of thoughts and mathematical problems
4. The student will be able to write poetry using different poetic styles.

Materials: Picture books, construction paper, crayons, markers, scissors and M&M bag of candies for each student.

Activity: Read More M&M Math to the students. Have the students follow the directions as you read and create their own M&M booklet. This activity can lead to another activity on probability and statistics. Students can predict the number of colored M&M's and then proceed to count them in each bag.

A second activity in this unit would be to read Grapes of Math. This book is filled with poetry all of which have a mathematical theme or connection. Students will use construction paper to write their own poem related to a mathematical theme.

Home Learning: An extension to this would be to have the students create and write a mathematical riddle.

Evaluation: Teacher observation, participation and final product.

Resource List

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Number Sense/Operation

1. A Place for Zero — Angeline Sparagna Lopresti
2. How Much is a Million — David M. Schwartz
3. The King's Commissioners — Aileen Freidman
4. The King's Chessboard — David Birch

Measurement

1. The Librarian that Measured the Earth — Lasky
2. Sir Cumference and the Dragon Pi — Cindy Neuschwander
3. Grandfather Tang's Story — Ann Tompert
4. How Big is a Foot? — Rolf Myller/Susan McGrath

Geometry

1. The Greedy Triangle — Marilyn Burns
2. Arrow to the Sun — Gerald McDermott

Algebraic Thinking/Data Analysis

1. The Grapes of Math — Barbara McGrath

2. Math Curse Jon Scieszka

3. M&M Math Greg Tang

Adapter Grant Information