Mathematical Novels

Ms. Vanesssa Paneca

Lesson 1

SSS- MC1.2.1 The student describes, draws, identifies, and analyzes two-and three-dimensional shapes. Therefore, given a verbal description, draws and/or models two- and three dimensional shapes and uses appropriate geometric vocabulary to write a description of a figure or a picture composed of geometric figures.

Objective: Student will be able to draw a picture to illustrate the story. Student will make a step book on the different geometry shapes with definitions. Student will make three-dimensional shapes using toothpicks and sugar drop candies.

Materials:
1. The Greedy Triangle
2. Greedy Triangle illustration book
3. Crayons/markers
4. String
5. Whole-puncher
6. Construction paper
7. Shape UP!
8. Gum Drops
9. Box of toothpicks
10. Soap
11. Small tubs with water

Activity:
1st Part
1. Distribute illustration book/crayons/markers and ask students to take out math journal-
2. Ask students to write a small paragraph about what they think the book is going to be about based on the title and cover
3. Read The Greedy Triangle
4. Allow time for students to make illustrations after each scene in the book in their illustration book
5. Give students time to make their final additions and give their book their finishing touches
6. Students share their books

2nd Part
1. Students make a step book- aligning each construction paper a select amount apart and them fold in half to make it look like a book

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2. Whole punch two holes on the top and place string through it to connect all the pages of the step book
3. You can see a thick space in each color so that the vocabulary term is displayed
4. First page has their name
5. Each page has an illustration of a geometry shape with definitions and notes on the object, amount of degrees, vertexes, sides, etc.

3rd Part

1. Read Shape UP!
2. Ask every student to take out math journal and make a prediction what they are going to do with the items placed on the teachers front table
3. Place students in small groups
4. Each group gets a small container with water that has soap
5. Give each group toothpicks and gum drops
6. Show them how they are going to make three-dimensional shapes using the toothpicks and gum drops then they are going to place them in the water and that will make it three-dimensional with sides from the watery-soap mix
7. The groups compete to try to have the most shapes with the given materials

Final Part

1. Complete a 3-2-1 for the activities
   3- interesting things
   2-things you learned
   1-question they still have

Assessment:

- Participation
- Math Journal
- Greedy Triangle Illustration book
- Step Book
- 3-dimensional shapes
- 3-2-1 for all three parts of activity

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Lesson 2

SSS- MA4.2.1 The student uses estimation in problem solving and computation. Therefore they learn to use and justify different estimation strategies in real-world problem situations and determine the reasonableness of results of calculation in a given problem situation.

Objective: Student will make predictions on how many items are in a jar and discover ways to predict the amount in a container.

Materials:
BETCHA
Math Journal
Jar filled with holiday candy (according to time of year: e.g. jelly beans, candy canes, kisses)
2nd jar filled with candy
FCAT extended response style paper for assessment

Activity:
Show the class the jar with candies and pass it around so that the children can estimate how many are in the jar.
Have students write their predictions in their Math Journal
Read the book BETCHA
As you read stop and discuss the various ways he tries to use to estimate.
Once you finish reading pass the jar around again and ask the students to use a strategy and make another prediction as to how many are in the jar.
Ask the children to write their prediction under the first one
Discuss different strategies that can be used
Count the number of candies
Ask students to write a conclusion as to the validity of their prediction.

Assessment:
Participation
Math Journal
Provide a second jar for the children to predict about using a strategy discussed (Ask students to use FCAT extended response style when writing their answer)

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Lesson 3

SSS- MA1.2.1 The student understands the different ways numbers are represented and used in the real world. Therefore they can name whole numbers combining three digit numeration and the uses of number periods, such as ones, thousands, and millions.

Objective: Student will make a place value snake to learn place value and discover the value of zero.

Materials:
A Place for Zero
Empty egg carton for each student
Scissors
Glue Stick
crayons
Stapler
"googly eyes" pipe cleaners and arts and craft materials for decorating

Activity:
Read a Place for Zero
Cut the lid off the egg carton and cut the base in two so that you have two rolls of six holes each.
Connect the two rolls so that you have one long snake with 12 rolls
Cut the last hole from the roll and glue it on top so that it makes the head of the snake
On the side starting from the right write ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions, etc.
Decorate your snake with eyes and pipe cleaners for the tongue
Now using counters, beans, marbles add it randomly to the place value hole and make students write the number in number form, expanded form and word form (10 per child)
They should leave places empty and realize the number zero goes in that place

Assessment:
Place value Snake
!0 problems the students complete

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Lesson 4

SSS- MAD1.2.1 The student describes, analyzes, and generalizes a wide variety of patterns, relations and functions. The student will be able to describe a wide variety of patterns, relationships through models, such as manipulative and generalizes a pattern.

Objective: Student will be able to make their own quilt using pattern blocks on a construction paper. Student will be able to use geo-mirrors, to make symmetrical patterns for quilts.

Materials:
A Cloak for the Dreamer
Quilt
Pattern block template
Crayons/markers
Scissors and glue stick
Construction paper
Geo-Mirror
Geo-Mirror symmetry handouts
Symmetrical Pattern Handout

Activity:
1st Part
Show students a quilt and ask students to take out math journal and write what they see (mathematically)
Read A Cloak for the Dreamer
Discuss how circles cannot be joined together to make a a cloak or quilt because they cannot be perfectly connected.
Pass out pattern block templates to students and allow them to color and design their pattern blocks.
Students cut and paste their pattern blocks on their construction paper to make a quilt
Students cut along the sides of the quilt and present their design to the class.

2nd Part
Give students geo-mirrors so that they know how to use the reflect mirrors to see the symmetry in different objects
Give practice symmetry handouts (quick and fun, their not time consuming)
Give students the Symmetrical Pattern handout- it provides students with various designs based on the number of lines of symmetry to create a quilt

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Using one design ask students to make a quilt using their geo-mirror (they draw the first one and use mirror to continue design)
Color design and showcase to the class

Final Part
COMPARE/CONTRAST
students make a Venn-Diagram and use it to compare and contrast using pattern blocks versus a geo-mirror to make a quilt.
Which do you feel is an easier way to make a quilt?

Assessment:
Participation
Math Journal
Pattern block Quilt
Handouts
Geo-mirror Quilt
Venn Diagram

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Lesson 5

SSS- MAB2.2.1 The student compares, contrasts, and converts within systems of measurement. The student uses direct and indirect measures to calculate and compare measurable characteristics. Also, selects and uses appropriate standard and nonstandard units of measurement, according to type and size.

Objective: Student will be able to understand the history of standard and nonstandard units of measurements. Student will be able to selects and uses appropriate standard and nonstandard units of measurement, according to type and size.

Materials:
1. How Tall, How Short, How far Away
2. Teacher made work problems of conversion
3. Teacher made work problems of addition and subtraction
4. Hershey's Measurement Book
5. Hershey's miniature candy
6. Table of items to measure using candy

Activity:
1st Part
1. Read How Tall, How Short, How far Away
2. Discuss reasons why they feel the US uses a different unit compared to the rest of the world
3. On the board put teacher made problems of going from one unit of measure to another in the customary unit of measurement (do not ask students to convert from customary to metric)
4. Addition and subtraction problems on board for students to complete as a quiz

2nd Part
1. Read Hershey's Measurement Book
2. Pass out candy to students
3. On the board make a table of different items that can be measured using the candies
4. Allow the groups recorder to make the table and record the results
5. Provide each group with a piece of butcher paper and a black washable marker
6. Each group picks one student, and another student traces them with the marker
7. Then the group measures the drawing using the Hershey's candies
8. To check their results they send the student that was traced to be measured on the wall that has the measuring tape and get an exact answer

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9. The students discuss the accuracy of their measurement

Final Part

1. Journal
   What would you consider the best tool to use when measuring and why?

Assessment:

- Participation
- Teacher made problems
- Groups Table
- Butcher child with measurement
- Journal

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Additional Books and ways to use them

1. **Spaghetti and Meatball For All-**
   Use for perimeter
   Use color tiles as if they were the tables and counters as if they were the guest
   Allow the students to work in groups and on a construction paper to manipulate ways to sit all the family members and guest that RSVP for the party, using a predetermined situation that you have placed on a Large index card (make different cards so the students all have different solution: easy to hard)

2. **Fraction Fun-**
   Use as an introduction to fractions
   provides a good introduction to vocabulary (e.g. numerator and denominator)
   Use fraction circles and fraction squares to compare fractions

3. **Inch worm and a half**
   to introduce how fractions are a part of a whole
   manipulative can be rectangular fractions

Additional Activities and ways to use them

1. **Tessellations-**
   using the pattern provided make students make a beautiful colorful repeating design so that they understand the concept of tessellations

2. **Fraction Ice Cream Sundaes-**
   Color and decorate a set of ice creams and place on overhead transparencies. Provide students with a sandwich size Ziploc bag and a set of ice cream scoops and sundae bowl. Then the students color and make their sundae, they add the total number of scoops and that is their denominator and each flavor tells the students the fraction of the sundae that is that flavor (example- there are a total of 12 scoops and 6 are strawberry then 6/12 or ½ is strawberry) the number of scoops of each flavor is the numerator. You can make oversized scoops and a bowl and design a class sundae to display on a bulletin board for open house/ parent conference days and nights.

3. **Checks, Register, and deposit slips-** to show students the importance of keeping a checkbook. Give students a proposed budget and allow them to plan a

party/banquet/feast for a set number of guest. They must cut out or print the items they are going to purchase with prices and account that they buy enough for the party. The best project theme with accurate register and well written checks and deposit slip is used as the model for the end of the year party/Thanksgiving Feast/ Holiday Banquet/etc. The students must buy the food, decorations and all the items required to have a successful event.