Marvelous Math Mania

Grade Level or Special Area: 5th Grade
Written by: Linda Heck, Dysart Elementary, El Mirage, AZ
Length of Unit: About 20 lessons

I. ABSTRACT

A. This unit is packed with hands-on math games and activities. It represents multiple math topics within the Core Curriculum and provides a generous sampling of number sense, computation, and probability. This unit will give teachers a bag of mathematics tricks and students will receive strategies to strengthen their thinking skills. Students' mathematical knowledge will be taken to a deeper level of understanding and they will be better prepared with skills needed to be successful on standardized tests. This unit can be taught at the pace of the class and these games can be used over and over again.

II. OVERVIEW

A. Concept Objectives

1. The student will develop a basic sense of numbers.
2. The student will develop a sense of importance for mental math.
3. The student will use upper level thinking skills to develop math problems.
4. The student will use logic and reasoning to solve problems.
5. The student will relate mathematical vocabulary words to daily problems.

B. Content from the *Core Knowledge Sequence*
(specifically from pgs. 123-125 of 5th grade mathematics, but matches these concepts from 2nd-6th grades as well)

1. Read and write numbers.
2. Recognize place value.
3. Write numbers in expanded form.
4. Locate positive and negative integers on a number line.
5. Round numbers to the nearest place value, up to 100 thousands.
6. Review perfect squares and square roots.
7. Identify numbers as prime or composite.
8. Recognize and identify percents.
9. Recognize fractions and write as decimals.
10. Read, write, and order decimals.
11. Multiply and divide numbers with and without mental computation.
12. Solve word problems with multiple steps.
13. Collect and organize data in graphic forms.
14. Understand probability as a measure of the likelihood that an event will happen.

C. Skill Objectives

1. The student will estimate and round numbers.
2. The student will use mental math to calculate problems.
3. The student will use problem solving and logical reasoning.
4. The student will put various numbers in ascending order.
5. The student will identify numbers written in various forms.
6. The student will practice calculation of multiplication and division.
7. The student will be able to summarize mathematical information.
8. The student will make predictions based on the logic of probability.
9. The student will calculate various types of mathematical problems

10. The students will use mathematical terms to identify meanings and make applications in mathematical problems.
11. The student will use estimation and prediction in application situations.
12. The student will use graphing and computation skills to solve problems.

III. BACKGROUND KNOWLEDGE

A. For Teachers
   1. Addison Wesley. *Mathematics*. New York: Addison Wesley Publishing Company, 1993. ISBN 0-201-44551-4
   2. Hirsch, Jr. E.D. *What Your Fifth Grader Needs To Know*. New York: Dell Publishing, 1991, ISBN 0-385-31026-9

B. For Students
   1. The student should be familiar with basic computation skills.
   2. The student should be familiar with rounding, estimating and graphing.
   3. The student should be able to apply math vocabulary to daily situations.
   4. The student should be able to use basic logical reasoning skills.
   5. The student should be familiar with predictions and probability.

IV. RESOURCES

A. *What Your Fifth Grader Needs To Know* (E.D. Hirsch)
B. *Mathematics* (Addison Wesley)
C. *Problem Solving and Logic* (Marcia Miller and Martin Lee)
D. *Graphic Organizers* (Jennifer Jacobson and Dottie Raymer)

V. LESSONS

Lesson One: "Roll and Round" Game

A. *Daily Objectives*
   1. Concept Objective
      a. The student will develop a basic sense of numbers.
   2. Lesson Content
      a. rounding numbers
      b. comparing numbers
   3. Skill Objective
      a. The student will use a dice to estimate numbers.
      b. The student will round numbers to the 10's, 100's and 1,000's place.

B. *Materials*
   1. Appendix A
   2. class set of dice
   3. pencils

C. *Key Vocabulary*
   1. estimate- to find an answer that is close to the exact answer
   2. rounding- replacing specific numbers with numbers expressed in even units

D. *Procedures/Activities*
   1. Do a quick review in rounding and estimation with the children. For example, write several numbers on the board and have them give the estimates of the numbers that are close to 10, 50, 100 etc.
   2. It is important to remind students that there is a difference between rounding and estimation. Practice rounding several numbers.

3. Tell students that they are going to be practicing rounding today by playing a game called, “Roll and Round”.
4. Students need to get a partner to play this game because it only works in teams of two.
5. When students have their partner, explain the rules of the game.
6. Each team shares one dice and one game card. Each player rolls the dice. Whatever number they get in their turn, they must place it on their side of the game card where they think it best fits. The idea is to get the closest to each number on the chart. Both players are using the same numbers. These numbers are located in the center of the card in bold print. Players take turns rolling and placing their numbers on the chart one at a time until all blanks are filled. Once a player writes the number down, he cannot change his choice. Players compare each answer with their partners. Whoever is closest, receives a tally mark in the corresponding box. Add up all the tally marks to see who has the most and that player is the winner. Students should play several times with several partners to get the hang of this, practice rounding and develop a better sense of numbers.

E. *Assessment/Evaluation*

1. Participation in the game is the assessment. Practice makes perfect!

Lessons Two and Three: Rounding, Rounding, and More Rounding

A. Daily Objectives

1. Concept Objective
   a. The student will develop a basic sense of numbers.
2. Lesson Content
   a. Uses for rounding
   b. Using mental math.
3. Skill Objectives
   a. The student play a game and try to round numbers in their head.
   b. The student will use mental math to calculate problems.

B. *Materials*

1. Appendices A and B
2. pencils and paper
3. dice
4. number line
5. construction paper, scissors, glue, and markers

C. *Key Vocabulary*

1. rounding-replacing specific numbers with numbers expressed in even units
2. number line- big chart covering wall showing numbers in relation to one another
3. mental math- calculating math problems in your head

D. *Procedures/Activities*

1. Begin the lesson by a review of yesterday’s rounding game. This time call up a few students one at a time and play the game with the students on the chalk board. Be sure to reason your choices out loud so that students can hear thought process for making number choices.
2. Have students direct their attention to the number line on the wall. Discuss how the numbers are arranged and how this could help in rounding. Point out that the increments of 10 are in red on the number line. Point out how the numbers in between the increments of 10 are either closer to one side or the other. It is important for children to develop number sense and not just memorize rules!
3. Tell students that they are going to be making their own large number lines later today, but first they are going to learn a new rounding game called “Awesome Eight!”

4. Explain the rules of "Awesome Eight." Students are to team up and take turns with rolling the dice. The number rolled each time is for both players. Each player decides where to place the number on the place value chart. They can put the number in the one's ten's or hundred's column for each turn. The object of the game is to be the player to get closest to the number 999 in his eight rolls without going over. If a player adds up all of his numbers and goes over 999 he automatically loses the game. Explain the importance of mental math in this game of rounding because if students do not keep track of carrying and regrouping numbers, it is quite easy to go over 999. There are nine rows on the chart. The last row is to add up the totals.
5. Students are to have 15 minutes to practice playing this game with different partners. At the end of 15 minutes, they are to begin constructing numbers lines in groups of 4 or 5 students. The purpose of this activity is to use a ruler and accurately space numbers. They should also make the increments of 10 a different color. This will make it helpful when students need help with rounding.
6. Because this activity is time consuming, allow an extra period to complete the number lines. When a group is completed with a number line, they make continue play of "Awesome Eight" but with the most advanced board. This time they will be working with four place values and can not exceed 1,500.

E. *Assessment/Evaluation*

1. Groups will get participation points for playing the games and will also receive a letter grade based on straight percentage points for the number line activity.

Lessons Four and Five: Counter Mathematics

A. *Daily Objectives*

1. Concept Objective
   a. The student will develop a sense of numbers.
   b. The student will develop a sense of importance for mental math.
2. Lesson Content
   a. mental math computations
   b. problem solving and equations
3. Skill Objectives
   a. The student will calculate various problems in his head correctly.
   b. The student will use problem solving and logical reasoning.

B. *Materials*

1. Appendix C
2. overheads of Appendices D, E, F, G
3. counters or caps to milk cartons
4. paper and pencil
5. Appendix T

C. *Key Vocabulary*

1. computation- to calculate the answers to math problems
2. multi-task problem- a math problem with more than one step in it

D. *Procedures/Activities*

1. Go over the key vocabulary words and define them with students.
2. Ask students to work in groups to come up with 2 word problems that can be solved only by completing more than one step.
3. Each group will take turns presenting their two word problems to the class and class will have to explain how to solve them.
4. Explain that the next activity has many computation math problems but that many of them will involve more than one step so be careful.
5. For this activity each student will need their own set of 10 counters. Each counter has a number on it, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. You can write numbers on counters

or milk caps with a permanent marker or you can use Appendix C and glue the paper counters on to thick paper and laminate them.

6. Explain that you will be putting an overhead up with various math problems. As the teacher calls out each problem one at a time, the student should calculate the answer mentally and grab the corresponding counter and place it on their desk. Students should only have about 10 seconds to find the answer before the teacher uncovers and reads the next problem on the overhead. As students find the answers, they should arrange their counters like a "Hopscotch" pattern in descending order on their desk. At the end of each over, unveil the answers at the bottom on the overhead and discuss any answers that the students had a difficult time with. There are four sample appendices to use for this lesson. This is an excellent upper thinking activity and should be used at least once per week. Simply use the numbers 0-9 only once for each paper and make up your own problems to use throughout the year.
7. Collect all counters from the children at the end of this day, but this lesson continues to the next day. On day two, remind children of this activity, but explain that they will make up 2 of their own problems as a group. Remind them that they can only use the numbers 0-9 one time for each problem Have students end day two by presenting their questions to other classmates. The classmates need to participate to see if the problems really worked.

E. *Assessment/Evaluation*

1. Cooperative group assignments will be collected and graded. Students will receive a grade for each set of word problems created. Points will be assigned by teacher made math rubric. (Appendix T)

Lessons Six and Seven: Order and Computation

A. *Daily Objective*

1. Concept Objective
   a. The student will develop a sense of numbers.
   b. The student will use upper level thinking skills to develop math problems.
2. Lesson Content
   a. number sense
   b. computation
3. Skill Objectives
   a. The student will put various numbers in order.
   b. The student will identify numbers written in various forms.
   c. The student will practice calculation of multiplication and division.

B. *Materials*

1. Appendices H, I, J, K
2. paper and pencil
3. dice
4. Appendix T

C. *Key Vocabulary*

1. fractions- a part of a number
2. decimals-any base ten number written with a decimal point
3. integers- whole numbers

D. *Procedures/Activities*

1. Have Appendix H cut out and glued to index cards. Pick 8 students to come up to the front of the class and hold the cards. They are to put the numbers in ascending order facing the class doing their reasoning aloud
2. Ask students why this activity was so difficult. Point out that it is important to recognize numbers in many different forms that they may take.

3. Pass out Appendix I to each cooperative learning group and have them cut out the cards and arrange the numbers in order. After about 10 minutes go over the answers with the class.
4. The assignment is for the groups to get 12 index cards and make up their own activity for the class to solve. However, they cannot just write numbers, but need to create an answer key as well.
5. At the end of the period, collect the cards and save them for the next day.
6. The following day, allow each group to trade cards with another group. Their job is to put the numbers in ascending order. After each group has gotten an opportunity to do this, the teacher will take each groups cards in front of the class and test them out. This activity tends to make brains hurt!
7. After all cards are checked, the students may practice their double digit multiplication and long division skills in the form of a game. They are to use the blank spinner from Appendix J and K. For multiplication use the smaller spinner. Help students select numbers for each of the two spinners that are compatible with what the class has been doing. The spinners with more spaces work best for division. For example, put three digit numbers in the small pie pieces and in the other spinner, put single digit numbers. Each team rolls a dice. The number on the dice is how many points the first person to compute the problem correctly will receive. Then, both spinners are spun using a paper clip and a pencil in the middle. If one spinner reads 7 and other 234, then the students will compute 234 divided by 7. This is a fun game and the teacher can decide what numbers to put in the spinners. You might also want to use this game for fractions and decimals.

E. *Assessment/Evaluation*
1. Participation points will be awarded for the spinner game and the completion of the number sense cards with answer key will be graded on the math rubric. (Appendix T)

Lessons Eight and Nine: It's Probably Probability

A. *Daily Objectives*
1. Concept Objective
   a. The student will develop a basic sense of numbers.
   b. The student will expand their skills of logic and reasoning.
2. Lesson Content
   a. Number sense
   b. probability
3. Skill Objectives
   a. The student will listen to the story, Probably Pistachio and summarize the main points and meaning.
   b. The student will make predictions based on logic.

B. *Materials*
1. Probably Pistachio by Stuart Murphy
2. Appendices L and M
3. brown bags
4. index cards and pencils
5. counters of various colors

C. *Key Vocabulary*
1. probability- how likely it is that an event will occur or not occur

D. *Procedures/Activities*
1. Define the word probability to the children and give them one sentence scenarios. Ask the students if each scenario has a high or low probability of happening today. For example, say, "It is going to rain today." Then discuss the

statement and the logical way to go about answering the question. Be careful to stay away from absolutes.

2. Now give each group a brown bag and 12 index cards. They are to spell the word I-N-D-I-A-N-A-P-O-L-I-S using 1 index card to each letter of the word. They are then to put the letters in the bag and shake it up. Each person at each cooperative group will take turns drawing letters out of the bag. This should go on for exactly five minutes. Record the results. Before doing this, make predictions about which letters will be pulled out more often than others and why.
3. Read the book, Probably Pistachio to the class. Be sure to discuss the theme of the book as you read. Students are to summarize the main points of the book in paragraph form.
4. At the beginning of the next math period, review the word probability. Now hold up a brown bag and tell them that there are 15 different counters in the bag, but don't tell them anything about their color. Then pass out Appendix L and tell students that they are to pick one statement that you think will be true most of the time when counters are pulled out of the bag. Pull counters out of the bag 10 different times and have students keep track of how many times their statement was true. Now reveal the colors of the counters and ask students if they would like to change their statement choice. Repeat the experiment on probability and discuss results.
5. Now pass out Appendix M and have students do this experiment as a game in their cooperative learning groups, only let them choose how many and what color counters go into the bag.

E. Assessment/Evaluation

1. The summary of the math story will be graded on the six trait writing rubric.
2. The students will be given participation points for the counter and letter games.

Lessons Ten and Eleven: Barrel of Mental Math

A. Daily Objectives

1. Concept Objective
   a. The student will develop a sense of the importance of mental math.
2. Lesson Content
   a. mental math calculations
   b. adding, subtracting, multiplying, and dividing
3. Skill Objectives
   a. The student will use addition, subtraction, multiplication, and division to *calculate problems in their head.*

B. Materials

1. Appendix N
2. paper and pencil
3. tickets

C. Key Vocabulary

1. even number- a number that ends in 0, 2, 4, 6, 8
2. odd number- a number that ends in 1, 3, 5, 7, 9
3. quotient- the answer to a division problem
4. sum- the answer to an addition problem
5. product- the answer to a multiplication problem

D. Procedures/Activities

1. Pass out a ticket to each student. Explain they will receive points in the form of tally marks for every correct answer that they have according to their ticket. A sample of questions is provided on Appendix N, but the teacher is encouraged to make up new and different problems according to what is being studied. It is

important to have students buddy up to check answers for a level of accountability. After several round of this game, the students are to make up their own list as a group and try it out on themselves as a group to see if this is a successful set of questions.

2. The teacher should collect the questions so that students do not lose them.
3. The next day, hand out the questions to different groups along with new tickets students will take turns using each others questions. With each set of new questions, new tickets should be distributed.
4. Then for more calculation fun there is another calculation game to play at the bottom of Appendix N. Pass it out along with six dice to each group and let the fun begin.

E. Assessment/Evaluation

1. The ticket questions will be collected and graded according to the six trait writing rubric. Participation points will be awarded for playing the dice game.

Lesson Twelve: The Eyes Are Watching

A. Daily Objectives

1. Concept Objectives
   a. The student will develop a sense of importance for mental math.
   b. The student will use upper level thinking skills to develop math problems.
2. Lesson Content
   a. mental math
   b. basic calculations
3. Skill Objectives
   a. The students will use mental math to compute problems correctly.
   b. The student will use logic and the concept of probability.
   c. The student will create a game with logical rules.

B. *Materials*

1. class set of dice
2. Appendix Q
3. paper and pencil

C. *Key Vocabulary*

1. probability- how likely it is for an event to occur or not to occur
2. mental math- calculating problems in your head

D. *Procedures/Activities*

1. Pass out Appendix O and explain directions to the children orally.
2. Allow children about 30 minutes to play this game and walk around and check to see if they are playing properly.
3. Collect the dice and tell students that they will work in pairs to make up a new game involving 4 dice, probability and fun. Give them time to develop rules and try their game with each other. They will need to write out the directions and rules to their new game.

E. *Assessment/Evaluation*

1. The student created game will be graded according to the 6 trait writing rubric.

Lesson Thirteen: Visualization and Awareness

A. *Daily Objectives*

1. Concept Objective
   a. The student will use logic and reasoning to solve problems.
2. Lesson Content
   a. logic and reasoning
3. Skill Objective
   a. The student will use logic and reasoning to make predictions.

B. *Materials*
   1. Appendix P
   2. paper and pencil

C. *Key Vocabulary*
   1. logical prediction- to make an educated and thoughtful guess
   2. visualization- how to picture objects by size and shape in relation to reality

D. *Procedures/Activities*
   1. Go over the key vocabulary words with students.
   2. Pass out Appendix P and carefully explain the directions to the students.
   3. Allow students to work independently on this assignment. After awhile, students will be encouraged to share their drawings with other students and discuss them.
   4. bring out actual objects and allow students to touch and observe and compare the actual shape and size of these objects to what each student visualized.

E. *Assessment/Evaluation*
   1. Students will be assessed based on participation points. Be careful not to give a straight percentage for this activity as this will be difficult for most students.

Lessons Fourteen and Fifteen: Mathematics Vocabulary Review

A. *Daily Objectives*
   1. Concept Objectives
      a. The student will relate mathematical vocabulary words to daily problems.
   2. Lesson Content
      a. Mathematics vocabulary from across the curriculum-
   3. Skill Objective
      a. The student will use mathematical terms and identify their individual meanings.

B. *Materials*
   1. Appendix Q
   2. Index cards
   3. class set of dice
   4. paper and pencil

C. *Key Vocabulary*
   1. All vocabulary studied from 5th grade scope and sequence (see Appendix Q)

D. *Procedures/Activities*
   1. Pass out Appendix Q. (This activity should only be done when most of the words have been taught, studied, and the children have used and applied them.)
   2. Take time to go over any new words or old words on the list that students may be having a difficult time grasping.
   3. Students are to work in their small groups to review all words by playing a game.
   4. To play the game, students will roll a dice when their turn comes out. The person to their right will ask them a word from the vocabulary list. If the student knows the meaning of the word (in their own words, preferably) they may receive the amount of points they rolled on the dice. Allow students about 30 minutes to play this game. Repeating words is great for the memory!
   5. At the beginning of day two of this assignment, review the words once more. This time the entire class will play a game together to help learn and review these math terms. The name of the game is “That’s Me.”
   6. To play this game, the teacher must do a little preparation. All words are written on index cards and meanings to the words and written on the back. The only trick is that the words and meanings should not match. The teacher starts out by saying one of the math terms. All students should have three or four cards with the definitions facing upward on their desk. Their job is to listen to the word and see

if they have the definition. If they do, they jump up and say, "That's Me" and then they read the answer. They in turn, flip the card over and read the next term. This game will go on until everyone is out of cards. This way the whole class gets to participate and everyone gains information.

E. Evaluation/Assessment

1. These activities are meant for participation points only.

Lesson Sixteen: Blowing Bubbles

A. Daily Objectives

1. Concept Objective
   a. The student will use logic and reasoning to solve problems.
2. Lesson Content
   a. logic and reasoning and probability
3. Skill Objective
   a. The student will count bubbles and make predictions.

B. *Materials*

1. soap
2. Appendix R
3. battery operated bubble maker
4. two types of bubble makers that do not require batteries
5. pencils

C. *Key Vocabulary*

1. estimate- to find an answer that is close to the exact number

D. *Procedures/Activities*

1. Pass out Appendix R and briefly go over the directions.
2. Students will go outside in their cooperative learning groups, one group at a time to complete this activity on prediction and estimation. The other students will have the opportunity to play a game from this unit of their choice while they are waiting to do the bubble activity.

E. *Assessment/Evaluation*

1. Appendix R will be graded on straight percentage points and recorded.

Lesson Seventeen: Candy Necklace Mathematics

A. *Daily Objectives*

1. Concept Objectives
   a. Students will develop a basic sense of numbers.
   b. Students will use logic and reasoning to solve problems.
2. Lesson Content
   a. computation
   b. application of math vocabulary
   c. graphing
3. Skill Objectives
   a. Students will apply math vocabulary to problem solving situations.
   b. Students will use graphing and computation skills to solve problems.

B. *Materials*

a. candy necklaces for each student
b. Appendix S
c. pencils and scrap paper

C. *Key Vocabulary*

1. graph- a graph using bars or lines to represent specific amounts
2. range- to subtract the lowest number from the highest number
3. median- the number in the middle when all numbers are in order
4. mean- to find the average by adding and dividing

D. *Procedures/Activities*

1. Pass out Appendix S and the candy necklaces. Go over the directions and review the vocabulary words on the page. Do sample problems to refresh memories.
2. Allow students about 30 minutes to complete this review activity.
3. Students may enjoy eating their necklaces once the paper is completed.

E. *Assessment/Evaluation*

1. Appendix S should be graded carefully for proper calculations and a straight percentage grade will be given and recorded.

VI. CULMINATING ACTIVITY

A. Students are to work in pairs to create their very own make game for others to play. The game must be well thought out, rules written out, and take at least 20 minutes to play. Also, the students need to try the game out first to make sure that it is successful. students need to be prepared to present this game to the class. When all games are completed and have been presented, we will have a game day where students try out each other's games! This should take about three days to complete the culminating activity.

VII. HANDOUTS

Appendix A	"Roll and Round" Game
Appendix B	"Awesome Eight"
Appendix C	Counters
Appendix D	Counter Activity 1
Appendix E	Counter Activity 2
Appendix F	Counter Activity 3
Appendix G	Counter Activity 4
Appendix H	Order of Numbers 1
Appendix I	Order of Numbers 2
Appendix J	Spinners 1
Appendix K	Spinners 2
Appendix L	Probability Game #1
Appendix M	Probability Game #2
Appendix N	"Ticket Math" and Rules to "5,000" or "10,000"
Appendix O	"The Eyes Are Watching"
Appendix P	Visualization: Awareness
Appendix Q	Math Vocabulary
Appendix R	Blowing Bubbles
Appendix S	Candy Necklace Mathematics
Appendix T	Math Rubric
Appendix U	Culminating Test Over Objectives Taught Through Math Games (U-1, U-2, and U-3)

VIII. BIBLIOGRAPHY

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Appendix A
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"Roll and Round" Game

Player 1 Tally				Player 2 Tally
	5 _	***50***	5 _	
	1 _	***10***	1 _	
	5 _ _	***500***	5 _ _	
	_ 7	***70***	_ 7	
	6 _ _	***1,000***	6 _ _	
	1 _ _ _	***100***	1 _ _ _	
	2 _ _	***200***	2 _ _	
	_ 6	***50***	_ 6	
Total Score _____				Total Score _____

Appendix B
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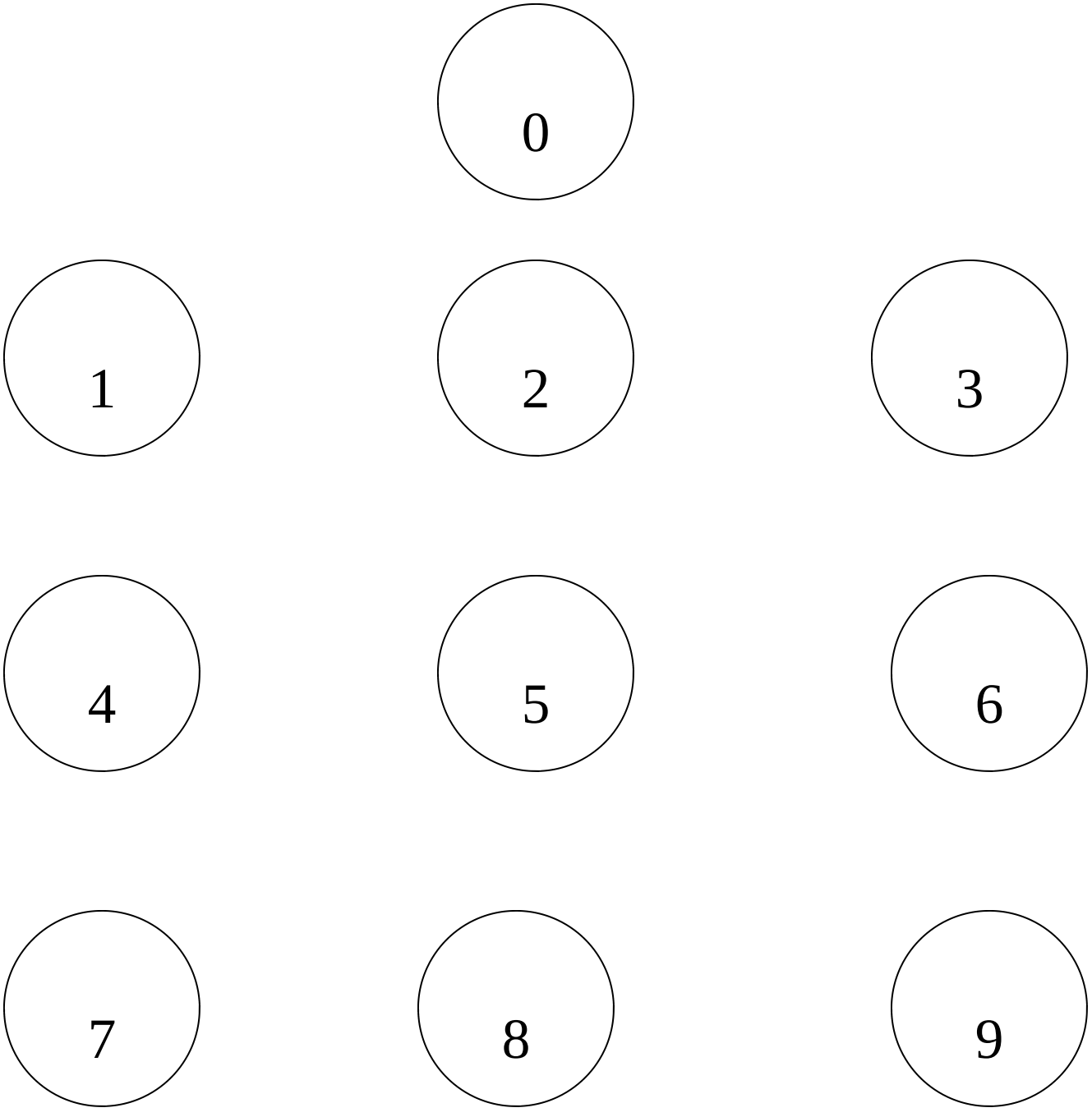
"Awesome Eight": 999

Hundreds	Tens	Ones
Total	**Total**	**Total**

"Awesome Eight": 1,500

Thousands	Hundreds	Tens	Ones
Total	**Total**	**Total**	**Total**

COUNTERS



Appendix D
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Counter Activity 1

Seven times eight

One dozen take away twelve

Number of legs on an octopus, take away 5

The largest 2 digit odd number take away 20

The number of months in a year

Four doubled

An even number

56

0

3

79

12

8

4

Appendix E
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Counter Activity 2

How many nickels are in 1 quarter

The largest 2 digit even number

The only number that divides evenly into all even numbers

Nine times nine, take away seven

The digit in the one's place when you round 78

The amount in a baker's dozen

The square root of 36

5

98

2

74

0

13

6

Appendix F
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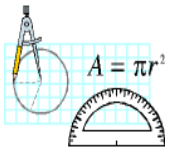


Counter Activity 3

1/3 +1/3 +1/3

The square root of 49

How many tens are in 400

Sides on a pentagon

Sides on four octagons

2 less than seven times 10

The largest digit

1

7

40

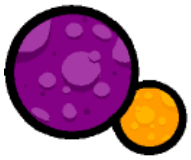
5

32

68

9

Appendix G
Marvelous Math Mania



Counter Activity 4

How many places are in the number one million?

What number times any number makes nothing?

Six times seven doubled

One dozen plus five

The square root of 100 plus twenty two

Seven times eight take away 56, plus 56

9

0

84

17

32

56

Order of Numbers 1

48.007

48.1

17 tens

49 ones

The sides on three pentagons

$\frac{100}{9}$

17 5/6

$\frac{10,000}{100}$

Order of Numbers 2

79 - 43

46 + 17

97.9800

97.99

25% of 80

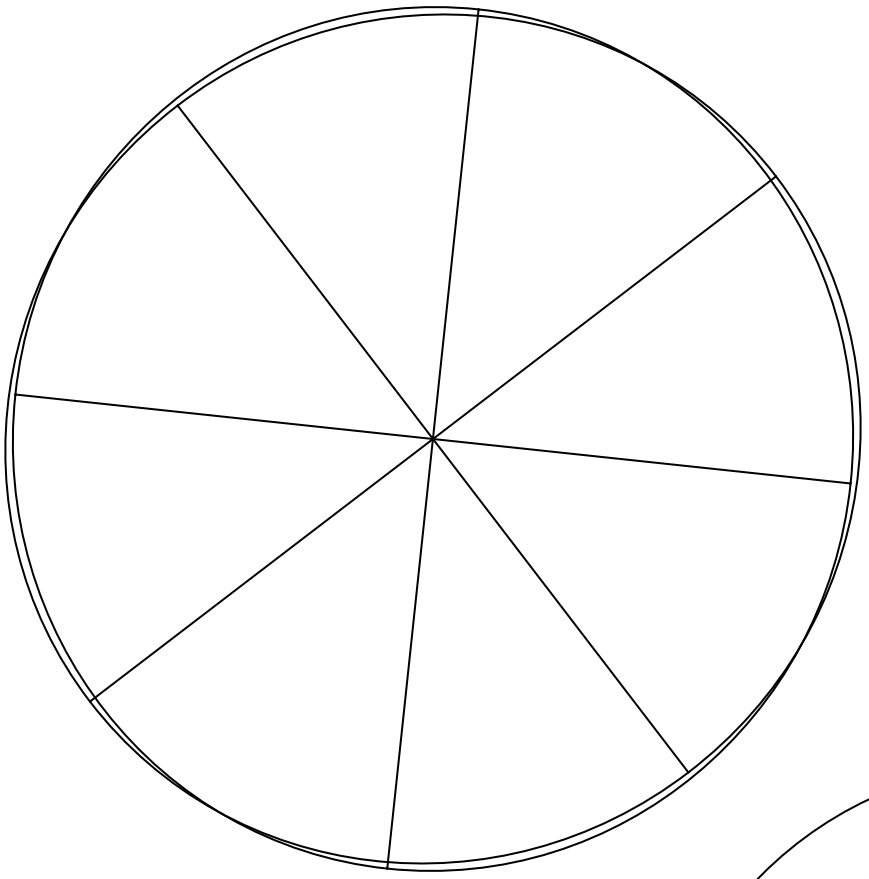
$\frac{65}{123}$

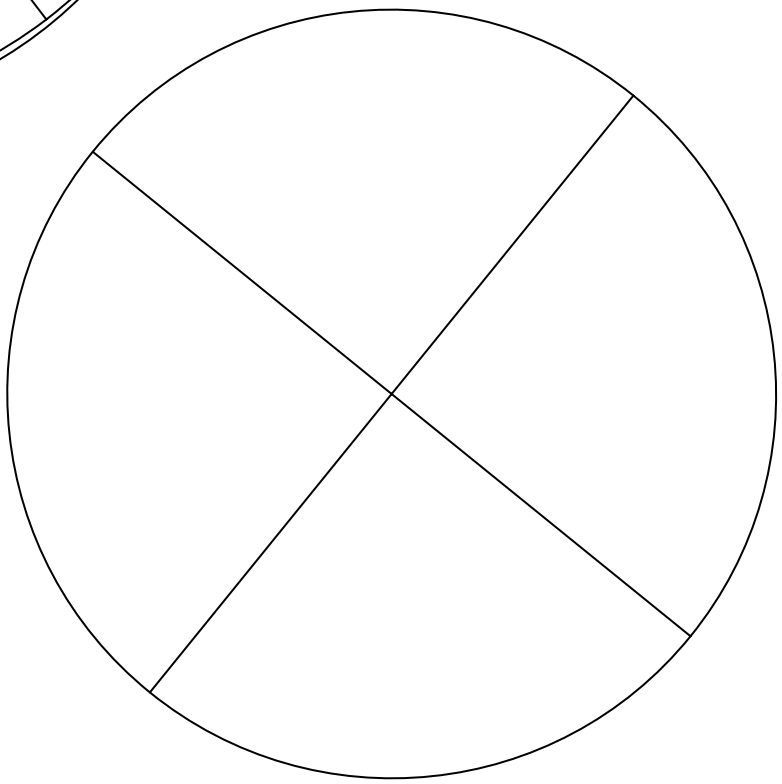
12 squared

The square root of 10,000

Appendix J
Marvelous Math Mania

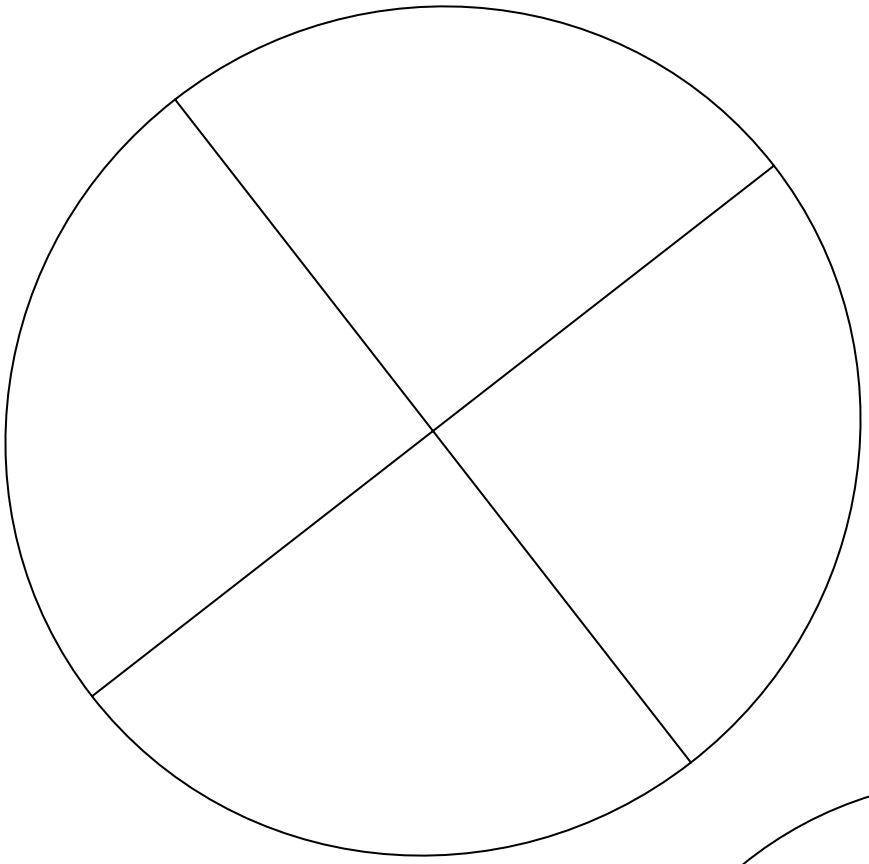
Spinners 1

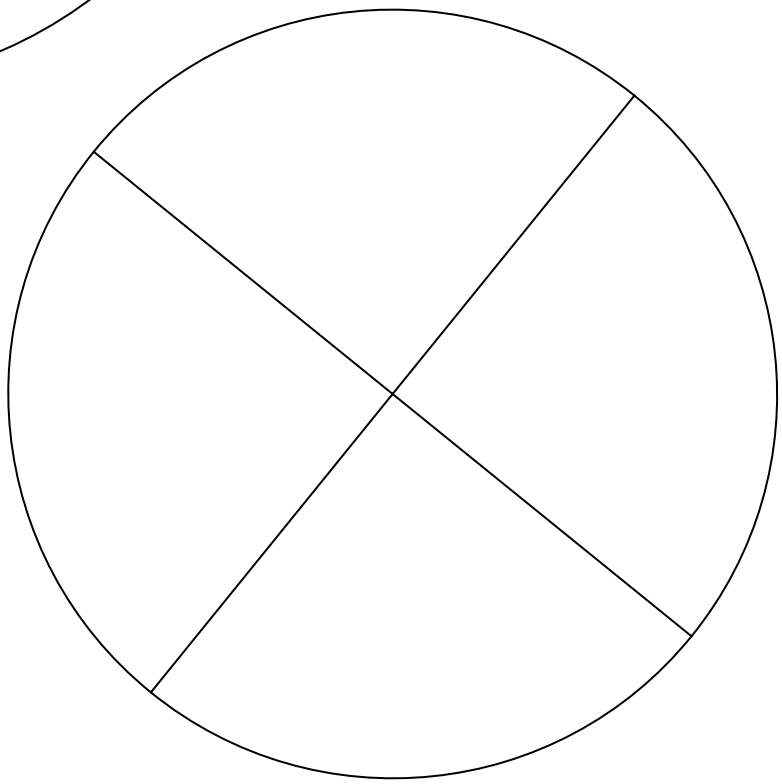




Appendix K
Marvelous Math Mania

Spinners 2





PROBABILITY GAME #1

ALL THREE TILES HAVE THE SAME COLOR

ALL OF THE TILES ARE RED

THERE IS A RED TILE AMONG THEM

NOT ALL TILES HAVE THE SAME COLOR

THERE ARE TWO RED TILES AMONG THEM

ONLY ONE TILE IS BLUE

THERE IS NO BLUE TILE AMONG THEM

THERE IS ONE GREEN TILE AMONG THEM

THERE IS ONE BLUE TILE

Appendix M
Marvelous Math Mania

PROBABILITY GAME #2

ALL THREE TILES HAVE THE SAME COLOR

ALL OF THE TILES ARE BLUE

THERE IS A RED TILE AMONG THEM

NOT ALL TILES HAVE THE SAME COLOR

THERE ARE TWO ORANGE TILES AMONG THEM

ONLY 1 TILE IS GREEN

THERE IS NO RED TILE AMONG THEM

THERE ARE TWO GREEN TILES

THERE IS ONE BLUE TILE

Appendix N
Marvelous Math Mania

"TICKET MATH"
SAMPLE QUESTIONS:

1. The sum of all of the digits is less than 14
2. The largest digit subtract the smallest digit is less than three
3. There are exactly three even numbers
4. There are more composite than prime numbers
5. Two or more numbers are divisible by three
6. The number in the thousand's place is more than the number in the one's place
7. There are more even numbers than odd numbers
8. The digit in the ten thousands place is a 7
9. The sum of the ones digit and the hundreds digit is more than seven
10. The difference of the ten thousand's digit and the ten's digit is more than 4

Rules to" 5,000" or "10,000"

1. Students may play in groups of 2 – 6 players.
2. Six dice are used at one time.
3. Player one rolls the dice and continue to play until he chooses to stop or until he loses his points.

Value of rolls
1= 10
2 = 20
rolling a 3, 4, 5, or 6 by itself or in pairs does not = anything
three ones (1, 1, 1,) =1000
three twos (2,2,2) = 2000
three threes (3,3,3) = 300
three fours (4,4,4) = 400
three fives (5,5,5) =500

These are the only combinations that have a point value. A player may choose to stop at any point and keep the points from that hand. However, if he chooses to continue rolling and rolls nothing, all points from that hand are lost. The first player to get to 5,000 or 10,000 shouts out "5,000" or "10,000" and is the winner!

Rules To: "The Eyes Are Watching"

1. Two to six players may play.
2. Each play requires the roll of four dice.
3. The object of the game is to get 100 points first.
4. A player can play as long as he likes. In other words, you may keep rolling and rolling until you get 100 points, but danger awaits!
5. If one (1) comes up the play must subtract 5 points from his score, but may keep rolling if he wishes.
6. If two (1's) come up, the player loses his turn along with half of his points that he rolled in the last hand.
7. If three (1's) come up the player loses his turn and all of his points from the last hand.
8. If all four dice come up (1's), the player loses his turn along with **ALL OF THE POINTS THAT HE SCORED THROUGHOUT THE ENTIRE GAME AND HE MUST START OVER WITH (0) POINTS.**
9. If a player reaches 100 points, he must shout out, ***"The Eyes Are Watching, But They Didn't Catch Me."***

VISUALIZATION: AWARENESS

How aware are you of the things you see and use a lot? Use your memory, and on separate sheets of paper draw each item in its actual size. Don't forget to label them. When you finish, compare your results with the actual sizes of these items.

1. A rectangle that encloses a space the size of the dollar bill
2. A circular region the size of a dime
3. The size of a Q-Tip
4. A circular region the size of a plastic top from a milk cap
5. The size of a new crayon
6. A square region the size of a floppy disk
7. A cylindrical shape the size of a soda can
8. A rectangle the size of a stick of butter
9. A role of Scotch tape
10. A pair of large scissors
11. A square the size of a soda cracker
12. A rectangle the size of a cassette tape
13. A Band-Aid
14. A bottle of glue
15. A circular shape the size of a CD
16. A package of gum (Extra)
17. A rectangle the size of a small index card (3 x 5)
18. A size 8 shoe (ladies)

Appendix Q
Marvelous Math Mania

MATH VOCABULARY

Space figure- a figure that has volume

Trapezoid- a quadrilateral with only one pair of parallel sides

Triangle- a polygon with only three sides

Vertex- the point that the two rays of an angle have in common

Similar figures- two figures that have the same shape

Segment- a straight path from one point to another

Scalene triangle a triangle with no sides the same length and no angles the same measure

Right triangle- a triangle that has one right angle

Right angle- an angle with a measure of 90

Ray- a part of a line, having only one end point

Rectangle a quadrilateral that has four right angles

Regular polygon- a polygon with all sides the same length and all angles the same measure

Rhombus- a quadrilateral with all sides the same length

Quadrilateral- a polygon with 4 sides

Pyramid- a space figure whose base is a polygon and whose faces are triangles with a common vertex

Prism- a space figure whose bases are congruent polygons in parallel planes and whose faces are parallelograms

Polygon- a closed figure formed by line segments

Point- a single, exact location, often represented by a dot

Plane figure- a figure that lies on a flat surface

Perpendicular lines- two lines that intersect at right angles

Pentagon- a polygon with 5 sides

Parallelogram- a quadrilateral with two pairs of parallel sides

Parallel lines- two lines that lie in the same plane and do not intersect

Obtuse angle- an angle with a measure greater than 90 and less than 180

Numerator- the number above the line in a fraction

Number pair- two numbers that are used to give the location of a point on a graph

Multiple- the number that is the product of a given number and a whole number

Median- the middle number when the numbers are arranged in order

Mode- the number that occurs most often in a set of numbers

Mean- the average found by dividing

Line of symmetry- a line that divides a figure exactly in half

Isosceles triangle- a triangle with at least 2 sides the same length and at least 2 angles the same measure

Hexagon- a polygon with 6 sides

Appendix Q/part 2

Octagon- a polygon with 8 sides

Sphere- a space figure in which all the points are the same distance from the center

Degree- the unit of measure for an angle

Cylinder- a space figure with 2 congruent circular faces

Cube- a space figure whose faces are all squares

Square-a quadrilateral with 4 right angles and all sides the same length

Face- one of the plane figures (surfaces) making up a space figure

Equilateral triangle- a triangle with all 3 sides the same length

Diameter- a segment containing two points of a circle and the center

Radius-a segment from the center of a circle to a point of the circle

Congruent figures- figures that have the same size and shape

Cone- a space figure with one circular face and one vertex

Acute angle- and angle that has a measure less than 90

Denominator- the bottom number in a fraction

Addend- the numbers added in an addition problem

Benchmark- an object of known measurement used to estimated the measure of another object

Chord- a straight line with both endpoints on a circle

Circle- a plane figure in which all the endpoints are the same distance from the center

Common factor- a number that is a factor of two different numbers

Composite number- any whole number greater than 1, that has more than 2 different factors

Common multiple- a number that is a multiple of two different numbers

Circumference- the distance around a circle

Capacity- the volume of a space figure given in terms of liquid measurement

Edge- **one of the segments making up the faces of a space figure**

Factor- the numbers in a multiplication problem that are not the product

Perimeter- the distance around a figure

Area- the measure of the inside of a figure in square units

Prime number a number that has exactly 2 factors (1 and itself)

Proportion- an equation showing that 2 ratios are equal (6/12 =1/2)

Quotient- the answer to a division problem

Difference- the answer to a subtraction problem

Sum- the answer to an addition problem

Product- the answer to a multiplication problem

Volume- the number of cubic units, a space figure will hold

Appendix R
Marvelous Math Mania

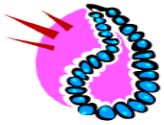
BLOWING BUBBLES

Name:_____

	small device	battery operated	silly device
How many in ten seconds?			
Estimate How many in 20 seconds.			
Actual amount of bubbles in 20 seconds.			
How well did this device work?			
Adjective to describe bubbles from this device.			

Appendix S
Marvelous Math Mania

CANDY NECKLACE MATHEMATICS
(show all work…….or no credit)



Name: _____ Date:_____

1. List each color in your necklace and the quantities of each.

2. On the back of this paper, make a **line graph** of the colors of your necklace.

3. What is the range of your colors?

4. Find the product of all of your colors.

5. Find the sum of all of your colors. (no calculator)

6. What is the color that matches the median.

7. What is the difference between the white and the green?

8. Write your colors in descending order and list the numbers underneath.

9. Find the mean of your necklace.

Teacher Made Math Rubric

Each is worth 5 points

____each person participated

____correct spelling conventions are used

____an answer key is attached

____project is neatly done

Total Points_____

Appendix U-1
Marvelous Math Mania

Cumulating Test Over Concepts Taught Through Math Games

1. Round the following numbers to the appropriate place value.

Numbers	Ten's Place	Hundred's Place	Ten Thousand's Place	Million's Place
45,687,094				
875, 983, 862				
871, 760, 071				
999,999,999				

2. Round the following numbers to the appropriate place value.

Numbers	Highest Place	Thousand's Place	Hundred Thousand's Place	Ten Million's Place
597,005,871				
672, 983,906				
31,987,743				
91,823,444				
329,999,003				
234,891,735				

Use mental math to add the following problems:

3. 67 + 103 + 400 + 50 =
4. 90 + 52 + 10 + 48 =
5. 675 + 75 + 75 + 25 =
6. 9 + 27 + 50 + 3 =

Solve the following problems and show your work:

7.	8.	9.	10.
45	934	73	95
x 47	x 92	x 74	x 32

11. 875 divided by 9

12. 8754 divided by 8

13. 8746 divided by 67

Probability

14. Define probability:

15. You are eating alphabet soup. The letters below are put in each can. If you take a spoonful, which two letters are you most likely to get?
p,u,l,j,k,k,a,b,c,p,x,p,x,p,r, s, p, k, p, k, t, u, v, w, x, y, z

17. You go to the pet store and see 10 dogs. 3 are brown, 5 are black and the rest are white.
What fraction of the dogs are:
**white?
**black?
Is is more **probable** that the white dogs or the black dogs will be adopted first and why?

Graphing

17. 5^{th} graders were polled and the following information was found.

Favorite Subjects:
Math: 17
Reading: 15
Science: 7
History: 22
Language Arts: 13

In the space below, create a bar graph illustrating this data with all required elements.

18. Create a line graph below. Use the topic, “Favorite Restaurants” and make up your own key and data.

Define the Following Terms:

19. sum-

20. addend-

21. quotient-

22. product

23. difference-

24. divisor-

25. dividend-