

Newark Charter School Units/Lessons

Mathematics ~ Grade 3

Newark Charter School Instructional Unit

Unit Title: Literature Computations

Content Area: Mathematics

Grade Level(s): Gr.3

Length of Unit: Ten lessons

Unit Summary:

The focus of this ten-day unit is to teach computation through the use of children's literature by integrating the mathematical concept with the stories. This unit introduces, reviews, and reinforces computation and problem solving skills to ensure mastery of the core objectives. The lesson arrangement is flexible and adaptable for any scope and sequence.

Common Core State Standards:

CCSS.Math.Content.3.NBT.A.1 Use place value understanding to round whole numbers to the nearest 10 or 100.

CCSS.Math.Content.3.NBT.A.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

CCSS.Math.Content.3.NBT.A.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations.

CCSS.Math.Content.3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.¹

CCSS.Math.Content.3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$*

CCSS.Math.Content.3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.³

CCSS.Math.Content.3.OA.D.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

CCSS.Math.Content.3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.³

CCSS.Math.Content.3.OA.D.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

Big Idea(s):

There are relationships that exist between the operations of addition, subtraction, multiplication, and division that are regular and do not change and can help us solve problems efficiently.

Enduring Understandings:

We must use common, precise mathematical language when we problem solve.

Number patterns and operations relationships are useful for solving problems in math.

Essential Question(s):

What are the relationships between the operations of adding, subtracting, multiplying, and dividing?

How does knowing these relationships and patterns help me problem solve in math?

Knowledge and Skills:

Students will need to know... (as per previous grades)

1. Numbers and number sense
2. Computation
3. Money

Students will be able to...

Concept Objectives

1. Students will understand the interrelationship between multiplication, division, addition and subtraction.
2. Students will be able to use mathematical language appropriately when problem solving.
3. Students will be able to use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.

Skill Objectives

1. Students will add different amounts of money to find the sum.
2. Students will use the take-away model to change a quantity by removing part of the amount until there's nothing left.
3. Students will use the take-away model to subtract the cost of items purchased from catalogs and retail fliers with the starting amount of \$100.
4. Students will use a hundreds chart for skip counting and repeated addition.
5. Students will play a game using number cubes and multiplication.
6. Students will solve and record multiplication problems using arrays.
7. Students will be able to write the repeated addition and multiplication equations to represent the illustration.
8. Students will observe that multiplication is a "short cut" for repeated addition.
9. Students will be able to skip count.
10. Students will be able to solve problems with more than one operation.
11. Students will be able to select an appropriate problem solving strategy to solve problems.
12. Students will be able to identify patterns in multiplication using pictorial models.
13. Students will be able to use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.
14. Students will use paper cookies to solve division problems and use number sentences and words to record solutions.
15. Students will divide two digit dividends by one- to two-digit divisors.
16. Students will solve division problems with remainders and decide what to do with the remainders.
17. Students will model to solve division problems and use number sentences to record solutions.

18. Student will understand that not all numbers are divided into equally.
19. Students will write division sentences.
20. Students will select or develop an appropriate problem-solving strategy, including drawing a picture, looking for a pattern...
21. Students will label and use mathematical language and symbols

Assessment Evidence

Performance or Transfer Tasks:

Students should make connections in their word problem solving in future classes. They should use precise mathematical language in explaining the relationships between addition, subtraction, multiplication, and division.

Rubrics:

See appendices

Other Evidence:

See appendices

Student Self-Assessment/Reflection:

See appendices

Learning Plan

Key Learning Events:

Lesson One: "Easy Come, Easy Go"-Alexander, Who Used to be Rich Last Sunday

A. Daily Objectives

1. Concept Objective(s)

- a. Students will understand the interrelationship between addition and subtraction.
- b. Students will be able to use mathematical language appropriately when problem solving.
- c. Students will be able to use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution f10. When it's one team's turn, the other pair will act as the "bankers" and

2. Lesson Content

- a. Addition
- b. Subtraction

3. Skill Objective(s)

- a. Students will add different amounts of money to find the sum.
- b. Students will use the take-away model to change a quantity by removing part of the amount until there's nothing left.
- c. Students will use the take-away model to subtract the cost of items purchased from catalogs and retail fliers with the starting amount of \$100.

B. Materials

1. Alexander, Who Used to be Rich Last Sunday by Judith Viorst

2. Coins (plastic or real)
3. 12"x18" Manilla paper (2 sheets per student)
4. Number cubes (two for each pair in a group of four)
5. Small container for money spent during game
6. Catalogues and store ads from newspaper
7. Glue and scissors
8. Appendix A

C. Key Vocabulary

1. Addend-any of a set of numbers to be added
2. Sum-the amount obtained as a result of adding
3. Subtrahend-a quantity or number to be subtracted from another
4. Difference-the amount by which one quantity is greater or less than another

D. Procedures/Activities

1. Ask students to tell about a time when they tried to save their money to buy something.
2. Read the story Alexander, Who Used to be Rich Last Sunday about a boy who received a dollar and spent all of the money in one week.
3. Using real or fake money and the operation of addition, students solve in their Math journals how much money Alexander's two brothers have while the teacher rereads that part of the story. The teacher should record the amounts of money each brother has on the board. Make sure students know how to line up the decimal points before adding.
4. Have students fold a 12"x18" sheet of paper into 8 sections to use in solving subtraction problems presented in the story.
5. Reread the story slowly and have the students subtract the amount Alexander spends one situation at a time. The teacher should model how to record the transactions for the first three situations. (There are a total of nine.)
6. The students will subtract the last six situations on their own.
7. After everyone is finished, the students will play, "Oh no, My Dollar is Gone!" in groups of 4.
8. Give each pair of opponents a set of number cubes and a dollar.
9. Give each group a small plastic bag with some change in it (quarters, dimes, nickels, and pennies).
10. When it's one team's turn, the other pair will act as the "bankers" and make change.
11. The game begins with the starting team rolling two number cubes, taking the sum, and subtracting the amount from their dollar. They will first need to exchange their paper dollar for change. (Before the game begins, decide what denominations the change could be.)
12. After they receive change for their dollar, they place the sum they rolled in a pile or container. That sum represents money spent.
13. The next team rolls for their turn.
14. The play continues until one side has no money left. If it's at the beginning of a round, the second team should go. If the second team still has money left after their turn, they are the winners. If the second team also loses all their money, the game is declared a tie.
15. Following the game, the students will write their own I Used to be Rich story on the other sheet of 12"x18" paper, but for their own version, they will have \$3 to spend. They need to include in their story how they earned/received the money and what items they bought to lose money. Decide on the minimum number of story frames their story should contain.

E. Assessment/Evaluation

1. The teacher will evaluate the students' responses from Alex, Who Used to be Rich Last Sunday and their own story using a rubric. See Appendix
2. Follow up activity: (Use for enrichment or assessment) Suppose Alexander had \$100 to spend. Use the catalogs and retail fliers to show how Alexander could spend \$100. Students will cut and glue the items they "bought" on large poster paper. Students will subtract and

show for each step the quantity remaining after subtracting from the money left over in the previous step.

Lesson Two: Multiplication by 2s-Mrs. Fitz's Flamingos

A. Daily Objectives

1. Concept Objective(s)
 - a. Student will understand the interrelationship between multiplication and addition.
2. Lesson Content
 - a. addition, repeated addition, multiplication
3. Skill Objective(s)
 - a. The student will be able to use hundreds chart for skip counting – repeated addition.
 - b. The student will observe that multiplication can be substituted for repeated addition.

B. Materials

1. Overhead/markers
2. Mrs. Fitz's Flamingos
3. Hundreds chart
4. A pair of number cubes for each set of partners
5. Paper to record
6. Pencil
7. Appendix B

C. Key Vocabulary

1. skip counting
2. pattern
3. multiplication

D. Procedures/Activities

1. Read Mrs. Fitz's Flamingos to class.
2. Discuss Mrs. Fitz's pattern of purchasing flamingos (she bought them 2 at a time).
3. Have students use hundreds chart to skip count by 2s. They will count by twos and shade in the numbers.
4. Discuss anything the students observe (pattern, numbers are even, etc.)
5. Use overhead of "Flamingos Everywhere." As a class, discuss how many flamingos would be purchased in one month. Have students use hundreds chart to compute the amount of flamingos bought in 6 months and then one year (52 weeks).
6. Discuss what students discovered. Demonstrate that repeated addition can also employ multiplication. Show $2+2+2+2$ is the same as 2×4 .
7. Demonstrate how to compute multiplication using the hundreds chart (start on 2 and go to the next 2 in succession by the number you are multiplying by. Ex. 2×6 = start at 2 and count 5 more 2s, ending on 12).

E. Assessment/Evaluation

1. Students will work in learning partners to play "Flamingo"!
2. Each set of partners needs a pair of number cubes, a hundreds chart, a piece of paper, and a pencil.
3. The first student rolls the number cube. He/she multiplies whatever numbers he rolls by 2. Ex. Learner rolls a 2 and a 7. They must add up the two numbers ($2+7$) (9) and multiply that by 2 (18). They may use the hundreds chart to find the answer.

4. The second student rolls and does the same thing.
5. The student with the largest answer wins. He/she puts the letter F on their paper.
6. The game continues with students earning letters to spell Flamingo. The first person that spells Flamingo wins!

Lesson Three: Chocolate Arrays

A. Daily Objectives

1. Concept Objectives

- a. Students will understand the interrelationship between multiplication, division, addition and subtraction.
- b. Students will be able to use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.

2. Lesson Content

- a. The student will be able to solve and record multiplication problems using pictorial models.

3. Skill Objective(s)

- a. The student will be able to solve and record multiplication problems using arrays.

B. Materials

1. one inch grid paper
2. colored tiles
3. plastic baggies
4. transparent colored tiles
5. Appendix C – Candy Company worksheet

C. Key Vocabulary

1. vertical – up and down
2. horizontal- side to side
3. commutative property of multiplication- reversal of factors will give the same product.
4. dimension- the measurement of a length or width.
5. array- grid representing multiplication equation.

D. Procedures

1. Teacher will tell the students that a chocolate candy company has approached her and asked if the students in his/her class have ideas for a new candy that kids their age would enjoy. The company will need to create the candy size based on the desire for chocolate. They will need to know how many pieces each bar should contain to satisfy their customers needs. Discuss with students that at the end of the lesson, they will have an opportunity to create their own candy bar.
2. Teacher will introduce/review vocabulary.
3. Teacher will model arrays using colored tiles on overhead of ideas for the various candy sizes beginning with 3×5 .
4. Teacher will demonstrate how students can skip count vertically or horizontally to come up with an answer.
5. Discuss and label arrays modeled on overhead.
6. Teacher will pass out grids and plastic baggies filled with 25 colored tiles.
7. Teacher will model an equation such as 2×6 and 6×2 .
8. Teacher will ask students if the amount of space has changed. Students should notice that the product stays the same even if the factors are reversed. Tell students that this is the commutative property of multiplication.

9. Teacher will call out equations for students to solve using arrays. Ask for volunteers to share answers.
10. Students will record in their math journal what they learned during the lesson.

E. Assessment/Evaluation

1. Students will create their own chocolate candy bar using appendix A.

Lesson Four: My Dream House

A. Daily Objectives

1. Concept Objective(s)
 - a. Students will understand the interrelationship between multiplication, division, addition and subtraction.
2. Lesson Content
 - a. Addition, repeated addition, and multiplication
3. Skill Objective(s)
 - a. The students will be able to write the repeated addition and multiplication equations to represent the illustration
 - b. The student will observe that multiplication is a "short cut" for repeated addition

B. Materials

1. Cindy Neuschwander's Amanda Bean's Amazing Dream – A Mathematical Story
2. transparency of a 100 count grid
3. 100 count grid paper for each child
4. pencils, crayons and colored pencils.
5. Appendix D
6. Appendix E

C. Key Vocabulary

1. column – A line of numbers, words or objects running down a page
2. row – A line of numbers, words or objects side by side
3. group – a number of things that go together or are similar in some way.

D. Procedures/Activities

1. Begin this lesson with reading the book, Amanda Bean's Amazing Dream – A Mathematical Story, to the class.
2. Discuss with the class a time they felt it took too long to count something. "Would it have been easier and faster to multiply?" Discuss the possibilities of multiplying rather than adding. In order to be able to multiply, things must come in groups, rows, or columns. (Refer back to the pictures of items coming in groups, columns and rows, from Amanda Bean's Amazing Dream)
3. Put on the overhead a copy of Amanda's Dream House. (Appendix D) Have the students look at each room in her house. Since Amanda loved to count everything, she wanted to find out how much space her house takes up on paper. Ask the students to figure out the amount of space that Amanda's bedroom took up. Count with them by ones. Ask the student's what might be a faster way of counting the space for her room. Skip count with the students by 5's. Next, point out to them the number of columns and rows that make up Amanda's room. $5 \times 6 = 30$. On Amanda's dream house, write in the space of her bedroom the addition problem, $(5+5+5+5+5+5=30)$ as well as the multiplication problem used to find the space needed for her room, $(5 \times 6 = 30)$. Write the total amount of space needed and circle it in the room, (30).
4. Repeat this process for the other rooms in Amanda's Dream House. Discuss with the class

which is faster for finding how much space each room takes up, addition or multiplication.

E. Assessment/Evaluation

1. Teacher will informally assess student understanding through the discussions while working on the overhead with the whole class.
2. The children will then get a piece of grid paper to make up their own dream house. Instruct the students to write an addition and multiplication sentence for each room in their house. In addition to these sentences, they should write and circle the total amount of space needed for each room. When each room is completed, the students will total up the amount of space their dream house takes up.

Lesson Five: How many at the Meeting?

A. Daily Objectives

1. Concept Objective(s)

- a. Students will understand the interrelationship between multiplication, division, addition and subtraction.
- b. Students will be able to use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.

2. Lesson Content

- a. Repeated addition, multiplication, and subtraction.

3. Skill Objective(s)

- a. The student will be able to skip count
- b. The students will be able to write the repeated addition and multiplication equations to represent the illustration
- c. The student will observe that multiplication is a "short cut" for repeated addition
- d. The student will be able to solve problems with more than 1 operation.
- e. The student will be able to select an appropriate problem solving strategy to solve problems.
- f. The student will be able to select or develop an appropriate problem solving strategy by looking for a pattern, systematic guessing and checking.

B. Materials

1. Greg Tang's, Math Appeal
2. transparency of a 100 count grid
3. "Meeting Seating" cards (Appendix ???)
4. Pencils
5. Appendix F
6. Appendix G
7. Appendix H

C. Key Vocabulary

1. column – A line of numbers, words, or objects running down a page.
2. row – A line of numbers, words, or objects side by side.
3. group – a number of things that go together or are similar in some way.
4. skip counting – assigned a given interval, count by that number and skip the numbers in between (5, 10, 15, 20, 25...)

D. Procedures/Activities

1. Begin this lesson by discussing an important meeting that the principal of your school is having in the cafeteria. When you went in to see if the meeting had started yet, you see the chairs all set up. Using the overhead, draw out 25 chairs (use x's) with 5 chairs in each of 5

rows. Have the children count by ones, the number of chairs the principal set up. Ask the students if there is a faster way to count the chairs. Skip count by 5's to count the chairs. (5, 10, 15, 20, 25) Then discuss how many rows of chairs were set up. How many chairs in each row? ($5 \times 5 = 25$).

2. Model for the students the repeated addition for this number of chairs, as well as the multiplication equation.

3. Repeat this for 15 chairs ($5 \times 3 = 15$) , 30 chairs ($5 \times 6 = 30$) and 12 chairs ($3 \times 4 = 12$)

4. Read aloud to the students "Frog Gone", from Greg Tang's Math Appeal. Pay close attention to the clue at the end of the page for figuring out the number of frogs. Brainstorm with the class ideas of how to come up with the answer to how many frogs there are without counting each individual frog. Count the rows of lily pads. Count how many lily pads in each row. Have a student write on the board the repeated addition problem. Have another student come up and write the multiplication problem. ($5+5+5+5+5=25$) ($5 \times 5 = 25$). Discuss with the class how this gets us closer to finding out the number of frogs on the page.

5. Next, count the number of lily pads that do not have frogs on them. (6) Using this information, how can you figure out the number of frogs that ARE on the lily pads? ($25 - 6 = 19$). There are 19 frogs.

6. Read "Rock Stars", from Greg Tang's Math Appeal. Be sure to pay close attention to the last couple of sentences that give a clue to how to figure this out quickly.

7. Discuss how many rows of stars there are, and how many stars are in each row. Skip count 6, 12, 18, 24, 30, 36. Have a student come up and write the repeated addition problem. ($6+6+6+6+6+6=36$) Have another student write the multiplication sentence on the board . $6 \times 6 = 36$.

8. Next count the missing stars. Discuss with the class how you can use this information to determine the number of stars on the page. Have a student come up to write the subtraction problem on the board. Subtract the missing stars from the total. $36 - 5 = 31$. There are 31 stars altogether.

9. Getting back to the meeting the principal is having in the cafeteria, use the overhead transparency we began with counting the 25 chairs (5 rows of 5 chairs). Circle 6 chairs randomly. Let the children know that the chairs you have circled are empty seats. How many people actually attended the meeting? How can you figure this out quickly?

10. Again show the multiplication for the seating arrangement, then subtract the number of open seats. Discuss with the class other situations they might be able to use this. Remember you can only multiply when things come in rows, columns, or groups.

E. Assessment/Evaluation

1. Teacher will informally assess student understanding through the discussions while working on the overhead with the whole class.

2. Break the class up into partners. Give each set of partners 4 " Meeting Seating" cards. Have the students figure out the attendance at each of the meetings. Be sure they show their work by skip counting, writing the multiplication sentence as well as the subtraction sentence.

Lesson Six: Each Child Has Two Eyes

A. Daily Objectives

1. Concept Objectives

a. Students will understand the interrelationship between multiplication, division, addition, and subtraction.

b. Students will be able to use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.

2. Lesson Content

- a. The student will be able to solve a multiplication problem using a pictorial model.
3. Skill Objective(s)
 - a. The student will be able to identify patterns in multiplication using pictorial models.
 - b. The student will be able to use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.

B. Materials

1. Each Orange Had Eight Slices
2. Math journals
3. Appendix I
4. Appendix J

C. Key Vocabulary

1. equal – having the same quantity
2. set- a group of matching or related things
3. skip counting – counting numerals based on a numerical pattern

D. Procedures

1. Teacher will call on four students to come to the front of the classroom. Pose the following problem. There are four students standing at the front of the room. Each student has 2 eyes. How many eyes do the four students have altogether?
2. The teacher will draw three circles on the board to represent the three children. Within each circle the teacher will place two tally marks to represent eyes. Ask students for answer.
3. The teacher will write the equation on the board and label the factors and product.
4. Repeat step one 3 more times using different criteria for problems such as:
 - 5 children – each has 10 toes – How many toes are there altogether?
 - 6 children – each has 2 legs – How many legs are there altogether?
 - 7 children – each has 5 fingers – How many fingers are there in all?
5. Teacher will read Each Orange Had Eight Slices to students. Students will record facts in their math journal. After the facts are written down, the students will create a pictorial model of the problem.
6. Teacher will call on students to share their answers. Discuss how they solved the problem.
7. Students will use their math journals to write down what they learned during the lesson.

E. Assessment/Evaluation

1. Students will create their own word problem using Appendix B. Compile into a class book or hang around the room so that other students can solve their classmates problems.
2. Teacher will use a rubric to score understanding of lesson.

Lesson Seven: Sharing Cookies-The Doorbell Rang

A. Daily Objectives

1. Concept Objective(s)
 - a. Students will understand the interrelationship between multiplication and division.
 - b. Students will be able to use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.
2. Lesson Content
 - a. Division
 - b. Multiplication

3. Skill Objective(s)4. Check to see if students can predict if there's going to be a remainder when dividing objects.

- a. Students will use paper cookies to solve division problems and use number sentences and words to record solutions.
- b. Students will divide two digit dividends by one- to two-digit divisors.
- c. Students will solve division problems with remainders and decide what to do with the remainders.
- d. Students will check their work by doing the inverse operation (multiplication).

B. Materials

1. The Doorbell Rang by Pat Hutchins
2. Paper cookies Xeroxed on colored paper
3. Multiple copies of the "Sharing Cookies" Worksheet stapled together (depending on how many cookie problems you want students to solve)
4. 12"x18" sheets of paper folded into 8 sections
5. Appendix K
6. Appendix L
7. Appendix M

C. Key Vocabulary

1. Dividend-a quantity to be divided
2. Divisor-the quantity by which another quantity, the dividend, is to be divided
3. Quotient-the quantity resulting from division of one quantity by another
4. Remainder-in division, the dividend minus the product of the divisor and quotient

D. Procedures/Activities

1. Tell students to write about what they know about division in their Math journals.
2. Share responses in class discussion.
3. Pass out many colored paper cookies and the Sharing Cookies worksheet (Appendix K) to pairs of students.
4. Have the students write in the blank at the top of the page the number of cookies to be shared among 4 children. Some choices could include: 6,5,4,3,2,and 1.
5. Students will then solve the problem and decide what to do if there are left over pieces (remainders).
6. Make sure students write the number equation to go along with their word answer.
7. Read The Doorbell Rang to students.
8. Stop each time the doorbell rings and ask students how they would write the problem.
9. Ask students to solve the division problem in one of the eight sections on the 12"x18" paper.
10. Ask students to share the ways they solved the problems.

E. Assessment/Evaluation

1. Students will change the number of cookies to be shared and the number of people sharing the cookies and solve problems on another sheet of 12"x18" paper. For example, instead of starting with 12 cookies, use the number 18. Students can also try the problems with different numbers of children sharing the cookies.
2. Use the rubric (Appendix M) to assess the students.
3. The teacher will give the students a division problem to solve in more than two situations. For example: 12 cookies divided by 4 students; 12 bean bag chairs divided by 4 students; \$12 divided among 4 students.
4. Check to see if students can predict if there's going to be a remainder when dividing objects.

Lesson Eight: A Remainder of One

A. Daily Objectives

1. Concept Objective(s)
 - a. Students will understand the interrelationship between division and subtraction.
2. Lesson Content
 - a. division with remainders
3. Skill Objective(s)
 - a. The student will model to solve division problems and use number sentences to record the solutions.
 - b. The student will understand that not all numbers are divided into equally.
 - c. The student will write division sentences.

B. Materials

1. A Remainder of One by Elinor J. Pinczes
2. egg carton cut in half with numbers in each section
3. counters
4. dice
5. lined school paper
6. pencils

C. Key Vocabulary

1. remainders
2. equally

D. Procedures/Activities

1. Read A Remainder of One to the class. When they get to the page where the ants are marching in rows of four, ask them if there is a solution so that the ant in the rear of the formation is not left out.
2. Complete the reading and ask what they noticed about the book. They should notice that some numbers can be divided equally and some can not.
3. Reread A Remainder of One and write the division equations that are represented on each page.
4. Review quotient, dividend and divisor.
5. Introduce the Remainders Game. Divide the class into partners. Give each partner pair 25 counters, one die, and the egg carton. Roll the die to show how many of the sections in the egg carton should be used. Divide the counters equally among the egg carton sections and keep any counters that are left. One partner should be dividing the counters and the other should be writing a division sentence to go along with the situation. The partners take turns counting out the counters and writing the equations.

E. Assessment/Evaluation

1. Informally assess each student's level of understanding during the class counter activity.
2. Collect the papers that were used with the Remainders Game to check understanding of writing equations.

Lesson Nine: Two Ways to Count to Ten

A. Daily Objectives

1. Concept Objective(s)
 - a. Students will be able to use a problem solving model, that incorporates

understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness .

2. Lesson Content

a. Skip counting and factors

3. Skill Objective(s)

a. The student will select or develop an appropriate problem-solving strategy, including drawing a picture, looking for a pattern ...

b. Recognize that there are shortcuts counting to ten, twenty and thirty.

B. Materials

1. Two Ways to Count to Ten, A Liberian Folktale retold by Ruby Dee

2. Interlocking blocks

3. Overhead or Chart Tablet

4. Ways to Count to Thirty Worksheet – Appendix N

C. Key Vocabulary

1. factors

2. skip counting

D. Procedures/Activities

1. Read Two Ways to Count to Ten as an introduction to skip counting and math factors.

2. Before reading the book completely, pose the question, what are the many ways that the animals have counted to ten? Are there any other ways to count to ten? Record the students' responses on the overhead or chart paper.

3. Ask if there are any ways to count to ten that do not work evenly? (3,6,9, with 1 left over does not work)

4. Distribute 20 interlocking blocks to each student. Discuss the possible ways to count to 20 evenly without having any blocks left over. Begin counting with one for simplicity. Ask "How many groups can be made if there is only one block in each group?" What would be a multiplication sentence for this solution? Next,

ask "Can 20 blocks be grouped in twos without having any blocks left over?" How would you count this?" What would it look like in a picture? Can you make a multiplication sentence to show what was done? Continue to group all the way to 20. Also ask, "Which counting patterns do NOT work?"

5. Distribute more blocks to each student along with the Ways to Count to 30 worksheet. The students will complete the worksheet independently. Find as many solutions for 30 as possible. Be sure to record the numbers that didn't work in equal groups.

E. Assessment/Evaluation

1. Informally assess each student's level of understanding during the class discussion that follows the reading.

2. Collect the Ways to Count to 30 worksheet to assess individual understanding of the skip counting concept.

Lesson Ten: Multiplication and Division Go Together

A. Daily Objectives

1. Concept Objective(s)

a. Students will understand the interrelationship between multiplication and division.

b. Students will be able to use mathematical language appropriately when problem solving.

2. Lesson Content

- a. multiplication and division
- 3. Skill Objective(s)
 - a. The students will label and use mathematical language and symbols.

B. Materials

1. Hershey's Kisses Multiplication and Division by Jerry Palotta
2. Chart Tablet
3. Markers
4. Overhead
5. Sentence Strips
6. Multiplication and Division Independent Practice Worksheet – Appendix O

C. Key Vocabulary and Symbols

1. X - multiplication sign
2. = - equal sign
3. factor - numbers that are being multiplied
4. product – the “answer” in a multiplication sentence
5. equation – a math number sentence where two quantities are equal
6. ÷ - division sign which means divided by
7. division – finding out how many times one number will go into another
8. dividend – first number in a division equation
9. divisor – second number in a division equation
10. quotient – the “answer” to a division problem

D. Procedures/Activities

1. Using a chart tablet that has several multiplication and division symbols drawn on it, ask the students what they know about the symbols.
2. Introduce Jerry Pallotta's book Hershey's Kisses Multiplication and Division as a source to clarify what symbols and vocabulary will help us understand multiplication and division.
3. Begin reading the book and reinforce some of the symbols and vocabulary by pointing them out on the chart.
4. After the book is read, use the overhead in a class activity to practice some of the new symbols and vocabulary by writing a symbol or equation on the overhead and asking questions about it (i.e. $2 \times 4 = 8$, What is the 2 called? What does the = mean? Or in $16 \div 8 = 2$, What is the 16 called? Why are math symbols and vocabulary important?)
5. For a whole group activity following the discussion, play a match up game of words and definitions. Before this lesson, prepare several sentence strips by writing the definitions (from the list of vocabulary and definitions in this lesson) and vocabulary on separate sentence strips. Pass out the strips and instruct the students to find the partner that matches the vocabulary word or definition on their sentence strip. Check and discuss with the whole class. Mix up the sentence strips and play the game again.
6. For independent practice, do the Multiplication and Division Worksheet, labeling the equations with the appropriate vocabulary words.

E. Assessment/Evaluation

1. Informally assess each student's level of understanding during their participation in the chart and overhead discussion and the match up game..
2. Collect the Multiplication and Division worksheet and check for accuracy in the understanding of the new symbols and vocabulary

CULMINATING ACTIVITY

- A. Students will get into teams to create a story book using all four methods of computation. They will check out book to take home to show parents.

Resources:

- A. Viorst, J. Alexander, Who Used to be Rich Last Sunday. New York: Simon & Schuster, 1978. 0-689-7199-9.
- B. Hutchins, P. The Doorbell Rang. New York: Greenwillow Books, 1986. 0-688-05252-5.
- C. Tang, G. Math for All Seasons. New York: Scholastic Inc., 2002. 0-439-44440-3.
- D. Giganti, P. Jr. Each Orange Had 8 Slices. New York: Greenwillow Books, 1992. 0-688-10428-2.
- E. Pallotta, J. The Hershey's Milk Chocolate Multiplication Book. New York: Scholastic Inc., 2002. 0-439-23623-1.
- F. Pallotta, J. Hershestudents can solve their classmates problems.
2. Teacher will use a rubric to score understanding of lesson.ey's Kisses Multiplication and Division. New York: Scholastic Inc., 2003. 0-439-56009-8.
- G. Pinczes, E. A Remainder of One. New York: Houghton Mifflin Company, 1995. 0-395-69455-8.
- H. McCloskey, K. Mrs. Fitz's Flamingos. New York: Lothrop Lee & Shepard, 1992. 0-68810-4746.
- I. Neuschwander, C. Amanda Bean's Amazing Dream: A Mathematical Story, New York: Scholastic Press, 1998. 0-590-30012-1

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- Viorst, J. Alexander, Who Used to be Rich Last Sunday. New York: Simon & Schuster, 1978. 0-689-7199-9.
- Hutchins, P. The Doorbell Rang. New York: Greenwillow Books, 1986. 0-688-05252-5.
- Ronfeldt, S. Third Grade Math: A Month-to-Month Guide. Sausalito, CA: Math Solutions Publications, 2003. 0-941355-56X.
- Burns, M. About Teaching Mathematics: A K-8 Resource. Sausalito, CA: Math Solutions Publications, 1992. 0-941355-05-5.
- Tank, B. & Zolli, L. Teaching Arithmetic: Lessons for Addition and Subtraction, Sausalito, CA: Math Solutions Publications, 2001. 0-941355-32-2.
- Hirsch, E.D. Jr. What Your 3rd Grader Needs to Know: Fundamentals of a Good Third Grade Education. New York: Dell Publishing, 1992. 0-385-31257-1.
- Bresser, R. Math and Literature. Sausalito, CA: Math Solutions Publications, 1995. 0-941355-14-4.
- Tang, G. Math for All Seasons. New York: Scholastic Inc., 2002. 0-439-44440-3.
- Giganti, P. Jr. Each Orange Had 8 Slices. New York: Greenwillow Books, 1992. 0-688-10428-2.
- Pallotta, J. The Hershey's Milk Chocolate Multiplication Book. New York: Scholastic Inc., 2002. 0-439-23623-1.
- Phillips, H. Multiplication & Division: 35 Hands-On Activities. Cypress, CA: Creative Teaching Press, Inc., 1997. 1-57471-240-3.
- Pallotta, J. Hershey's Kisses Multiplication and Division. New York: Scholastic Inc., 2003. 0-439-56009-8.
- Pinczes, E. A Remainder of One. New York: Houghton Mifflin Company, 1995. 0-395-69455-8.
- McCloskey, K. Mrs. Fitz's Flamingos. New York: Lothrop Lee & Shepard, 1992. 0-68810-4746.
- Akers, J., Berle-Carman, M., Tierney, C. Things That Come in Groups. New York: Dale Seymour Publications, 1998. 1-57232-695-6.
- Mokros, J. & Russell, S. Combining and Comparing. New York: Dale Seymour Publications, 1998. 1-57232-700-6.
- Sheffield, S. Math and Literature: (K-3) Book Two. Sausalito, CA: Math Solutions Publications, 1995. 0-941355-11-X.
- Burns, M., Kharas, K. & Wickett, M. Lessons for Algebraic Thinking. Sausalito, CA: Math Solutions Publications, 2002. 0-941355-48-9.

Tang, G. Math Appeal. New York: Scholastic Inc., 2003. 0-439-21045-3.
Neuschwander, C. Amanda Bean's Amazing Dream: A Mathematical Story, New York:
Scholastic Press, 1998. 0-590-30012-1.

Differentiation:

Watch for those students who exhibit weak understanding of any of the four operations. Form small skill groups throughout the unit and work with them to strengthen their skills where needed.

Technology Integration:

Parts of this lesson can easily be developed into Smart lessons.

Content Connections:

Many of the stories bring in connections from other content domains. Be sure to stop and discuss when appropriate.

Scoring Rubric for *Alex, Who Used to be Rich Last Sunday*

Did the student record and subtract each transaction in the Alex story correctly?

Clearly Outstanding	Acceptable	Getting There	Not Yet
25	20	15	10

Did the student record and subtract each transaction in his/her own story accurately?

Clearly Outstanding	Acceptable	Getting There	Not Yet
25	20	15	10

Did the student play the game "Oh no, My Dollar is Gone!" successfully?

Clearly Outstanding	Acceptable	Getting There	Not Yet
25	20	15	10

Does the student appear to understand the concept of the take away model of subtraction?

Clearly Outstanding	Acceptable	Getting There	Not Yet
25	20	15	10

Flamingos everywhere!



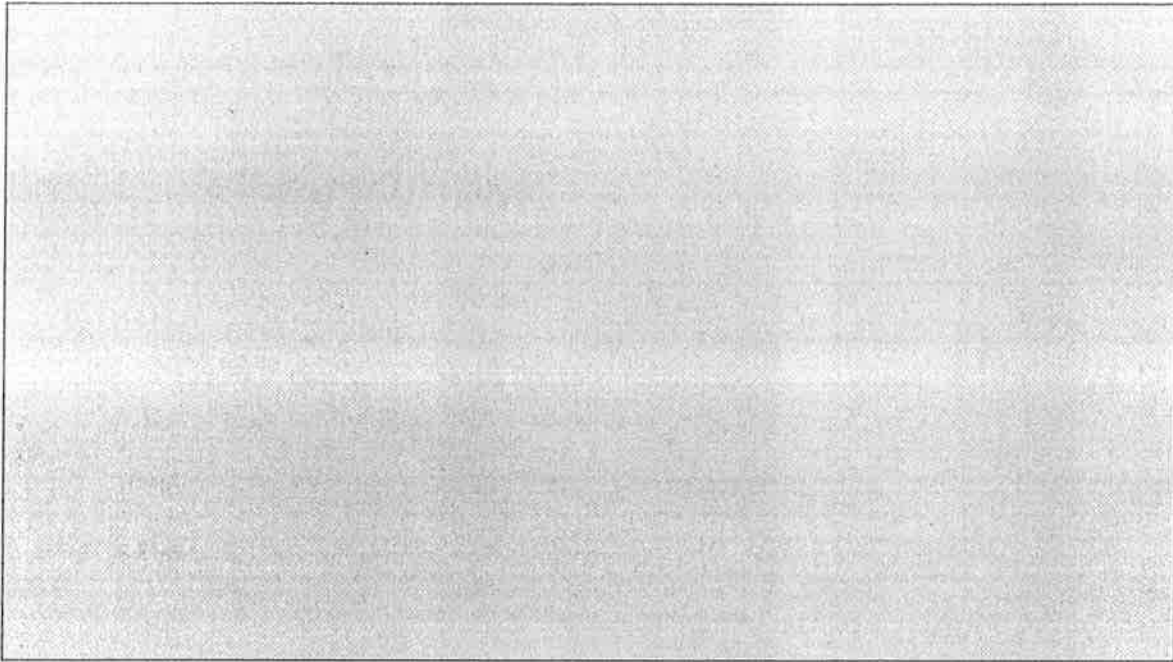
Mrs. Fitz bought 2 flamingos every Thursday. How many flamingos did she buy in 1 month (4 weeks)? In 3 months?

Number of flamingos bought	Week	Total Number of Flamingos
2	1	2
2	2	4
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	

In 1 month _____

In 3 months _____

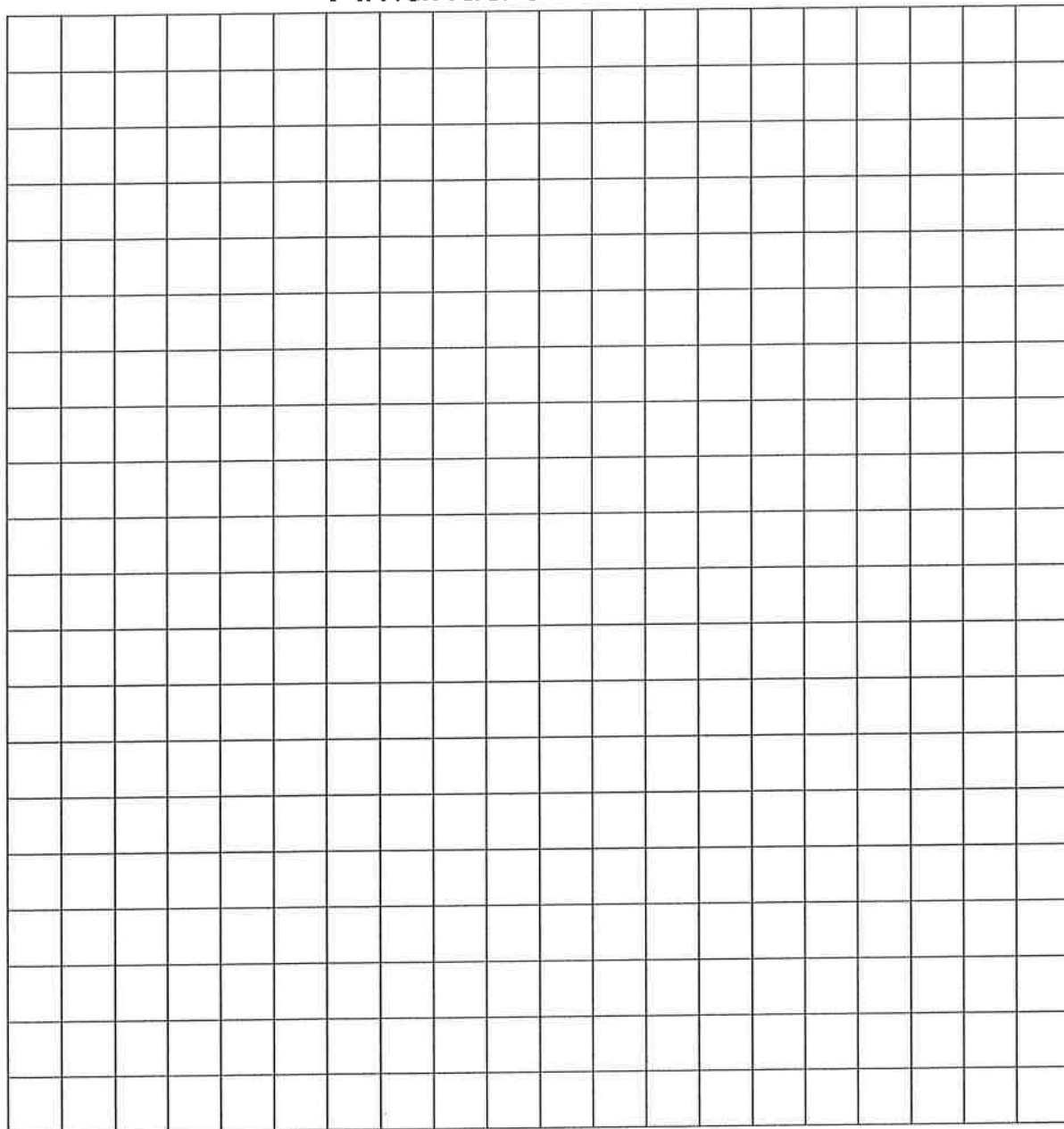
Name _____



The president of the Chewy Chocolate Candy Company has asked for your ideas on the creation of a new candy bar. He is trying to decide the amount of chocolate it will take to satisfy the customers sweet tooth. Design your chocolate bar in the box above. List the dimensions of the candy bar and tell how many pieces there will be in all.

On the lines below, convince the president why he should choose your design.

Amanda's Dreamhouse



Rubric for *Amanda Bean*

Topic _____ Name _____

Category	4	3	2	1
Diagrams	Diagrams and equations are completed with 90% accuracy or above	Diagrams and equations are completed with 80% accuracy	Diagrams and equations are completed with 70% accuracy	Several of the problems are incomplete and inaccurate
Reasoning	Uses higher level thinking skills	Uses effective reasoning	Uses some evidence of reasoning	Uses little evidence of reasoning
Explanation	Explanation is detailed and clear	Explanation is clear	Explanation is somewhat difficult to understand , but includes necessary components	Explanation is very difficult to understand and is missing necessary components

Final Score _____

[illegible]

Multiplication sentence:
How many seats altogether?
Number of empty seats:
Subtraction sentence:
How many people were at the meeting?

[illegible]

Multiplication sentence:
How many seats altogether?
Number of empty seats:

Appendix G

The Meeting Rubric

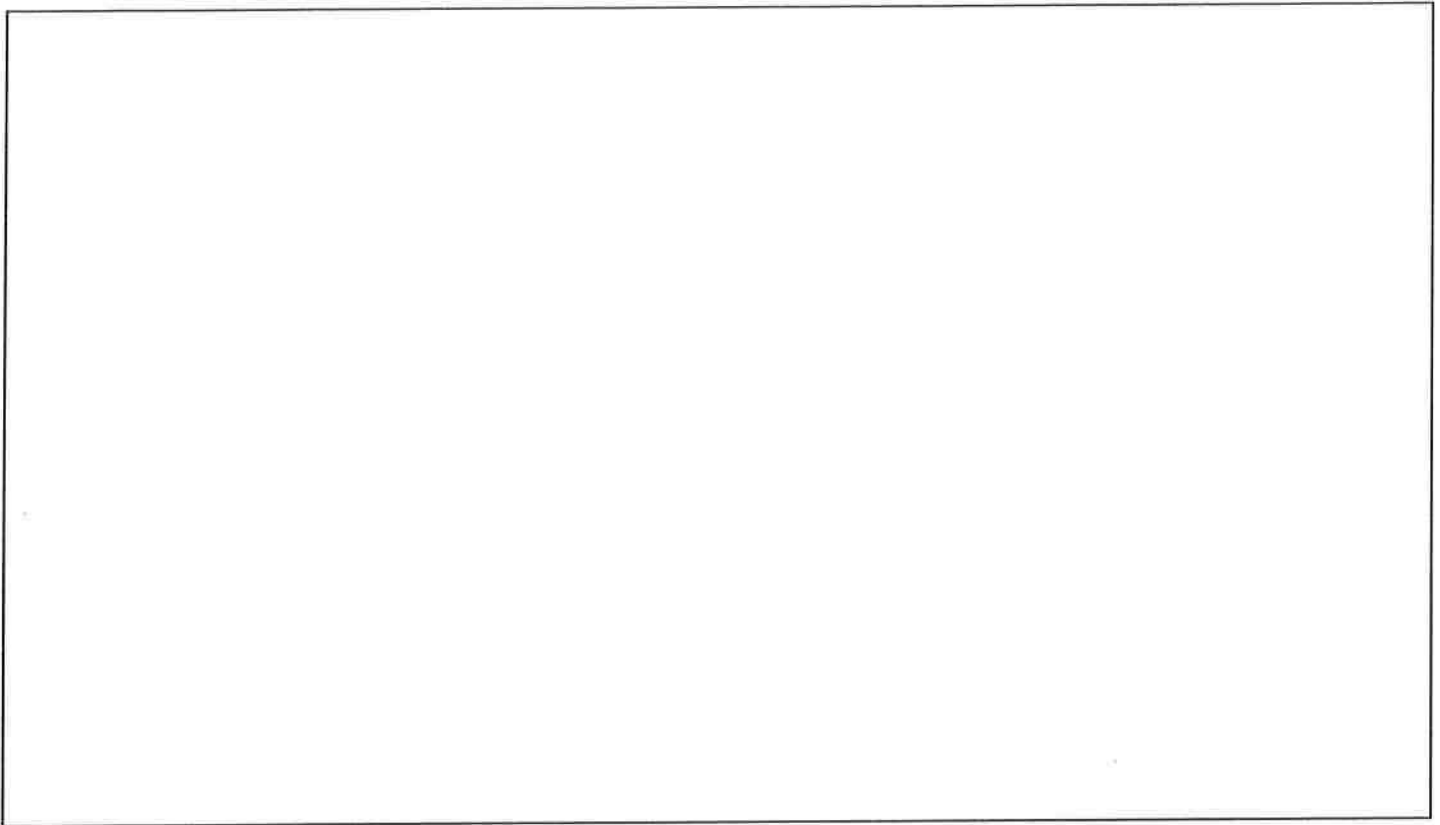
Topic _____ Name _____

Category	4	3	2	1
Completion	All problems are completed with 100% accuracy	All problems are completed with 80% accuracy	All problems are completed with 70% accuracy	Several of the problems are incomplete and/or inaccurate
Reasoning	Uses higher level thinking skills	Uses effective reasoning	Uses some evidence of reasoning	Uses little evidence of reasoning
Accuracy and Neatness	Math work is correct and neat	Math work is correct and somewhat neat	Math work is correct, but not neat	Math work is incorrect and not neat

Final Score _____

Each Child Has Two Eyes

Name _____



How many _____ **were there?**

How many _____ **were there?**

How many _____ **were there in all?**

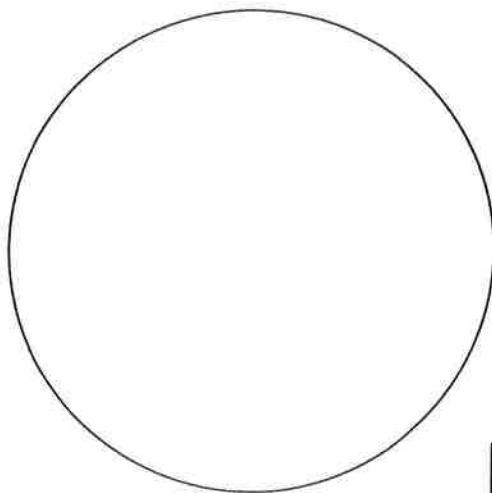
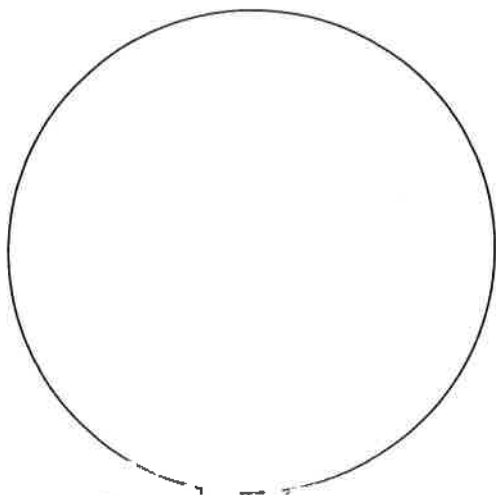
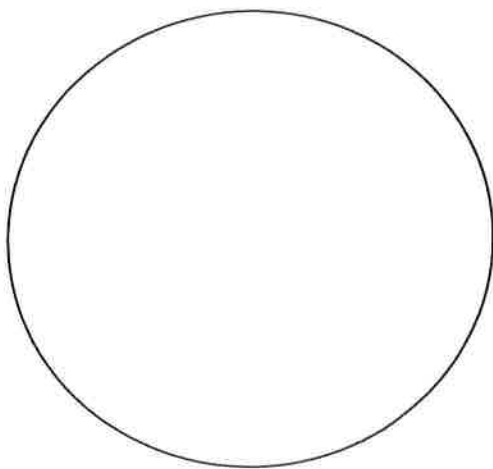
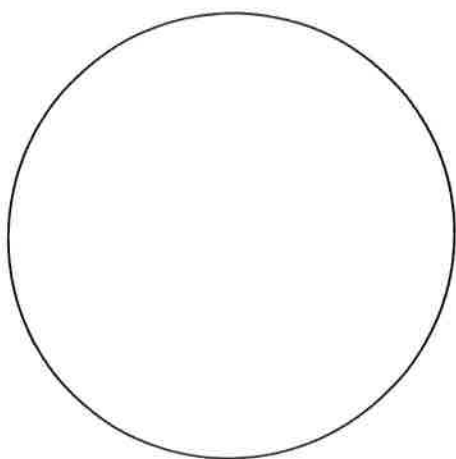
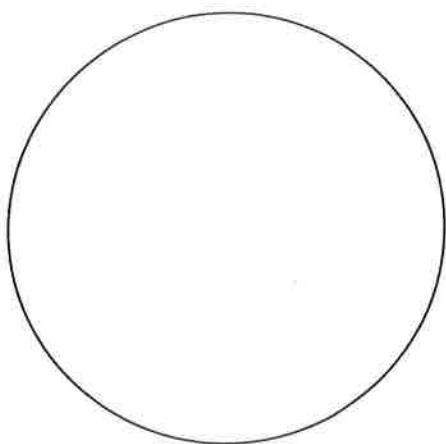
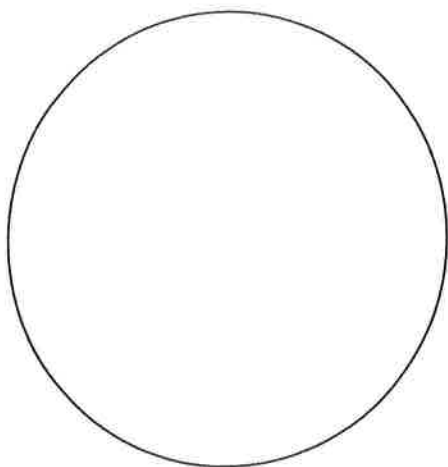
Rubric for Two Eyes

Topic _____ Name _____

Category	4	3	2	1
Math Concepts	Explanation shows complete understanding of the concept	Explanation shows substantial understanding of the concept	Explanation shows some understanding of the concept	Explanation shows very limited understanding of the concept
Reasoning	Uses higher level thinking skills	Uses effective reasoning	Uses some evidence of reasoning	Uses little evidence of reasoning
Explanation	Explanation is detailed and clear	Explanation is clear	Explanation is somewhat difficult to understand , but includes necessary components	Explanation is very difficult to understand and is missing necessary components
Accuracy and Neatness	Math work is correct and neat	Math work is correct and somewhat neat	Math work is correct, but not neat	Math work is incorrect and not neat

Final Score _____

Sharing Cookies



Sharing Cookies

Suppose a group of 4 children wants to share _____ cookies among them. Using the colored paper cookies, show much each person would get? Show your equation.

Scoring Rubric for *The Doorbell Rang*

Was the student able to communicate clearly how he/she solved the problems of sharing the cookies among 4 children on the worksheets?

Clearly Outstanding	Acceptable	Getting There	Not Yet
25	20	15	10

Was the student able to solve the problems in the story itself?

Clearly Outstanding	Acceptable	Getting There	Not Yet
25	20	15	10

Was the student able to recognize that even though the situations change, the division equation remains the same? (12 bean bag chairs divided among 4 children is the same as \$12 divided by 4 people)

Clearly Outstanding	Acceptable	Getting There	Not Yet
25	20	15	10

Did the student know what to do with remainders if there were any?

Clearly Outstanding	Acceptable	Getting There	Not Yet
25	20	15	10

Name _____

Ways to Count to 30

I counted by _____.
Here is what it looked like:

This is my counting pattern:

I can show my counting with a multiplication sentence:



I counted by _____.
Here is what it looked like:

This is my counting pattern:

I can show my counting with a multiplication sentence:

I counted by _____.
Here is what it looked like:

Name _____

Multiplication and Division

Fill in the blanks below the math sentences with the correct symbols, vocabulary and definitions from the box below.

x multiply

= equals

factor- numbers that are being multiplied

product – the “answer” in a multiplication sentence

equation – a math number sentence where two quantities are equal

÷ division sign which means “divided by”

division – finding out how many times one number will go into another

dividend – first number in a division sentence

divisor – second number in a division equation

quotient – the “answer” to a division problem

$$5 \times 3 = 15$$

$$20 \div 5 = 4$$
