

Level 2.0 - 3.9



LEVEL:	2.0 - 3.9
STANDARD:	Any, according to which math skills students write about
BENCHMARK:	Varies, according to standard
DESCRIPTION:	Many adult learners suffer from math phobia. The math autobiography helps both the adult learner and the adult teacher identify some of the causes of math phobia and see strengths and weaknesses students have in the area of math. Autobiographies also help the student begin to identify his/her own learning style and see himself/herself as central to the learning process.
MATERIALS:	Pencil and paper; Math Autobiography handout
PROCEDURE:	Students respond to the following prompt in writing. The writing is read for content only, unless it is made clear to the student that this assignment will address both math and writing skills and revision will be expected and directed. A handout of the student prompt is copy ready on the following page. Evaluation: Discussion of this autobiography can serve as a way to plan a student's work in math.

Student: _____

Date: _____

Teacher: _____

MATH AUTOBIOGRAPHY

Tell me about your experiences with math so far in life. For example, in what ways have you felt successful with learning math? In what ways have you felt unsuccessful in learning math? What is the earliest math experience you can remember? Was there a time when your feelings about learning math changed significantly? What caused this to happen? How do you use math outside of school? How would you define math? Are there certain topics or skills in math that you particularly like or dislike? Describe them. How would you rank math among other subjects in enjoyment or interest? Have you had good teachers or bad teachers and how were they good or bad? What is your family's attitude toward math?

Write your math autobiography as if you were writing a letter telling someone about your feelings about math and how they developed, or write as if you were writing to yourself in a journal. Do not worry about spelling, punctuation, etc. Concentrate on remembering and evaluating as many of your math experiences as possible.

LEVEL:	2.0 - 3.9
STANDARD:	7.0 Show awareness of ways numbers are represented and used in the real world
BENCHMARK:	07.01 Associate whole numbers less than 100 to their respective spoken names, written names, and numerals.
DESCRIPTION:	Understanding of Cardinal Numbers
MATERIALS:	Newspaper; paste; scissors, Cardinal Numbers Sheet
PROCEDURE:	<p>Give students the Cardinal Numbers Sheet. They should become familiar with the numerals as well as the number words. Explain as simply as possible that each higher denomination adds another zero or another digit. Explain digit positions (place value). Take, for example, the number 4,567; seven is in the “ones” position, six is in the “tens” position, five is in the “hundreds” position, and four is in the “thousands” position.</p> <p>At first, work with no more than four digits. Have the students look through today’s newspaper for numerals and for number words. Have them clip at least twenty-five (25) of each. Many numerals can easily be found in advertisements. Instruct the students to paste the numerals on a sheet of paper, then have them determine the number word each represents. Tell students to write the appropriate number word next to each number. Next, have students paste their newspaper number words on another sheet of paper, and write the numeral it represents next to the correct word. When complete, have students share their work.</p>

Student: _____

Date: _____

Teacher: _____

CARDINAL NUMBERS

0	zero	70	seventy
1	one	71	seventy-one
2	two	80	eighty
3	three	81	eighty-one
4	four	90	ninety
5	five	91	ninety-one
6	six	100	one hundred
7	seven	101	one hundred one
8	eight	102	one hundred two
9	nine	200	two hundred
10	ten	300	three hundred
11	eleven	400	four hundred
12	twelve	500	five hundred
13	thirteen	600	six hundred
14	fourteen	700	seven hundred
15	fifteen	800	eight hundred
16	sixteen	900	nine hundred
17	seventeen	1,000	one thousand
18	eighteen	2,000	two thousand
19	nineteen	3,000	three thousand
20	twenty	4,000	four thousand
21	twenty-one	5,000	five thousand
22	twenty-two	6,000	six thousand
23	twenty-three	7,000	seven thousand
24	twenty-four	8,000	eight thousand
25	twenty-five	9,000	nine thousand
26	twenty-six	10,000	ten thousand
27	twenty-seven	11,000	eleven thousand
28	twenty-eight	12,000	twelve thousand
29	twenty-nine	13,000	thirteen thousand
30	thirty	14,000	fourteen thousand
31	thirty-one	15,000	fifteen thousand
40	forty	20,000	twenty thousand
41	forty-one	50,000	fifty thousand
50	fifty	100,000	one hundred thousand
51	fifty-one	1,000,000	one million
60	sixty	100,000,000	one hundred million
61	sixty-one		

Benchmark: 07.01, 07.02, 09.02, 11.01, 11.02

- LEVEL:** 2.0 - 3.9
- STANDARD:** 7.0 Show awareness of the ways numbers are represented and used in the real world
9.0 Compute addition and subtraction problems,
11.0 Apply math skills in word problem applications
- BENCHMARK:** 07.01 Associate whole numbers less than 100 to their respective spoken names, written names, and numerals.
07.02 Understand the relative size of whole numbers between 0 and 100.
09.02 Add whole numbers to solve real-world problems using appropriate methods of computing; such as, manipulatives, mental mathematics, and paper and pencil.
11.01 Recognize clue words for choosing operations to be used to solve real-world problems, e.g., add, plus, total, sum, subtract, difference, left, remaining, multiply, times, several, divide, each, and per.
11.02 Explain the reasoning steps in solving real-world problems by:
• determining the question
• identifying the information given
• deciding on the operation
• working and checking
• making certain the answer is logical
- DESCRIPTION:** Students will read a story problem, then answer questions and solve problems.
- MATERIALS:** Paper/Pencil, Activity Sheet, Counters (number cubes, dice, an equivalent to serve as counters, etc.)
- PROCEDURE:** Divide the students into groups of two. Distribute the materials giving each pair a worksheet and enough counters to assist in answering the questions. Students will take turns filling out the worksheet and using the counters to answer the questions. Read the story problem. Demonstrate how to fill in the chart. The students will draw the number of apples each student picked in the story problem. The students will take turns using the counters and the chart to answer the questions.
- Variation:**
Use larger or smaller number of apples.

Benchmark: 07.01, 07.02, 09.02, 11.01, 11.02

Student: _____

Date: _____

Teacher: _____

Story Problem:

Mrs. Core's class was studying seeds and fruit in their science class. Some of the students went to Mr. Peel's orchard to pick apples. Charles picked 14 apples, Jill picked 12 apples, John picked 18 apples, Alice picked 16 apples and Mary picked 11 apples.

Draw the number of apples each student picked.

Name of Student	Number of Apples Each Student Picked																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Charles																			
Jill																			
John																			
Alice																			
Mary																			

1. Who picked the most apples? _____

2. Who picked the least apples? _____

3. Who picked the most: the girls or the boys? _____

4. How many more? _____

5. How many did the students pick altogether? _____

6. How many did the three girls pick? _____

7. How many did the two boys pick? _____

8. How many more did John pick than Charles? _____

9. How many more did Alice pick than Mary? _____

10. How many more did Alice pick than Jill? _____

11. Write one problem on your own from the chart.

Benchmark: 07.01, 07.02, 09.02, 11.01, 11.02

Answer Key

Story Problem:

Mrs. Core's class was studying seeds and fruit in their science class. Some of the students went to Mr. Peel's orchard to pick apples. Charles picked 14 apples, Jill picked 12 apples, John picked 18 apples, Alice picked 16 apples and Mary picked 11 apples.

Draw the number of apples each student picked.

Name of Student	Number of Apples Each Student Picked																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Charles	●	●	●	●	●	●	●	●	●	●	●	●	●						
Jill	●	●	●	●	●	●	●	●	●	●	●	●							
John	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alice	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Mary	●	●	●	●	●	●	●	●	●	●									

1. Who picked the most apples? John
2. Who picked the least apples? Mary
3. Who picked the most: the girls or the boys? girls
4. How many more? They picked 6 more apples
5. How many did the students pick altogether? 70 apples
6. How many did the three girls pick? 38
7. How many did the two boys pick? 32
8. How many more did John pick than Charles? 4
9. How many more did Alice pick than Mary? 6
10. How many more did Alice pick than Jill? 4
11. Write one problem on your own from the chart.

Benchmark: 07.01, 07.02, 08.01, 08.03

LEVEL: 2.0 - 3.9

STANDARD: 7.0 Show awareness of the ways numbers are represented and used in the real world
8.0 Understand number systems

BENCHMARK: 07.01 Associate whole numbers less than 100 to their respective spoken names, written names, and numerals.
07.02 Understand the relative size of whole numbers between 0 and 100.
08.01 Understand and apply the concepts of counting by 2s, 3s, 5s, 10s, 25s and 50s.
08.03 Classify a number as even or odd.

DESCRIPTION: The teacher will demonstrate by example using 100s transparency chart on the overhead projector and solicit student response for understanding.

MATERIALS: Overhead projector, 100s chart transparency, Student's 100's chart
Red and blue crayons or colored pencils

PROCEDURE: Distribute the 100's charts to each student.
Identify odd and even numbers on the overhead.
Ask several students to point to odd or even numbers on their charts.
Have the students color the odd numbers blue and the even numbers red.

Variation:

- What happens to even or odd numbers when numbers are added to them?
- Choose correct number and colors and count by 2, 3, 5, 10, 25, and 50, etc.
- Students can count by multiples using colored squares.

Benchmark: 07.01, 07.02, 08.01, 08.03

Student: _____

Date: _____

Teacher: _____

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Answer Key

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

- LEVEL:** 2.0 - 3.9
- STANDARD:** 7.0 Show awareness of the ways numbers are represented and used in the real world
14.0 Recognize a wide variety of patterns, relations and functions
- BENCHMARK:** 07.02 Understand the relative size of whole numbers between 0 and 100.
14.01 Recognize symbols and concepts of equal (=) and unequal (\neq) and less than (<) and greater than (>).
- DESCRIPTION:** The students in pairs will roll the number cube to make two three-digit numbers and then order them by using greater than, less than, and equal signs.
- MATERIALS:** One number cube (die) per group , Activity Sheet, Base ten blocks
- PROCEDURE:** Divide the students into pairs and pick student #1 and student #2 for the activity.
Distribute activity page, one die and a set of base ten blocks to each pair. Demonstrate how students will roll the die and enter numbers into boxes. Explain to the students that they will need to determine which sign belongs in the circle. Use the base ten blocks to make the numbers. This will help determine which number is greater than, less than, or equal to. Answer the questions at the bottom of the page.
- Variation:**
- Use larger number cubes
 - Use more boxes for larger digit numbers
 - Use fewer boxes for smaller digit numbers

Student: _____

Date: _____

Teacher: _____

Digit Dilemma

	Student #1				Student #2		
1.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="radio"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
2.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="radio"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="radio"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="radio"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="radio"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
6.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="radio"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
7.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="radio"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
8.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="radio"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
9.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="radio"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
10.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="radio"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Questions:

1. How did you determine the greater or lesser number?

2. What is the greatest number on the whole page?

3. What is the least number on the whole page?

- LEVEL:** 2.0 - 3.9
- STANDARD:** 7.0 Show awareness of the ways numbers are represented and used in the real world
- BENCHMARK:** 07.03 Use objects to represent whole numbers, commonly used fractions, or mixed numbers and relate these numbers to real-world situations, e.g., $\frac{1}{4}$ pizza, $\frac{1}{2}$ sandwich, and 1 and $\frac{1}{2}$ pies.
- DESCRIPTION:** Using objects to represent whole numbers.
- MATERIALS:** Party Planning Handout
- PROCEDURE:** Open the class with this problem:
There are 7 people in your car. You order a pizza to share.
Can you cut the pizza into 7 pieces (not equal in size) with just 3 straight cuts?
- Talk about dividing things like pizza up evenly for more than one person to eat. Give these examples:
- 1 pizza , 2 people = $\frac{1}{2}$ a pizza each
1 pizza, 4 people = $\frac{1}{4}$ a pizza each
2 pizzas, 3 people = 1 $\frac{1}{2}$ pizzas each
- Present them with the problems on the handout. They may work alone or in small groups of 2 to 3.

ANSWER KEY: Opener:

Pizza:

30 divided by 6 = 5, each person gets $\frac{1}{5}$ of a pizza

Subs:

30 divided by 9 = 3 $\frac{1}{3}$ people will share one sub, so each person will get $\frac{3}{10}$ of a sub

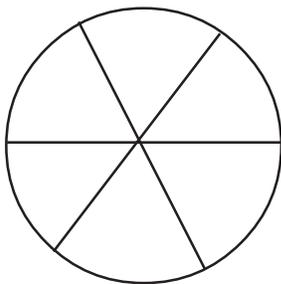
Bag of chips: 30 divided by 2 = 15, so each person will get $\frac{1}{15}$ of a bag

Cake:

30 divided by 3 = 10, so each person will get $\frac{1}{10}$ of a cake

Soda:

30 divided by 5 = 6, so each person will get $\frac{1}{6}$ of a 2-liter of soda



Student: _____

Date: _____

Teacher: _____

Party Planning

Your class is planning a big end of the year party. You are in charge of refreshments. The menu will consist of pizza, subs, chips, cake, and 2-liter sodas. After you take donations and count the money from fundraising, you have enough money to buy 6 pizzas, 9 subs, 2 bags of chips, 3 cakes, and 5 2-liters of soda.

Now you need to determine how much to feed each person so that each person gets the same amount. There are 30 people in your class including the teacher. Determine how you will divide the food up to complete your task and report to the class your findings.

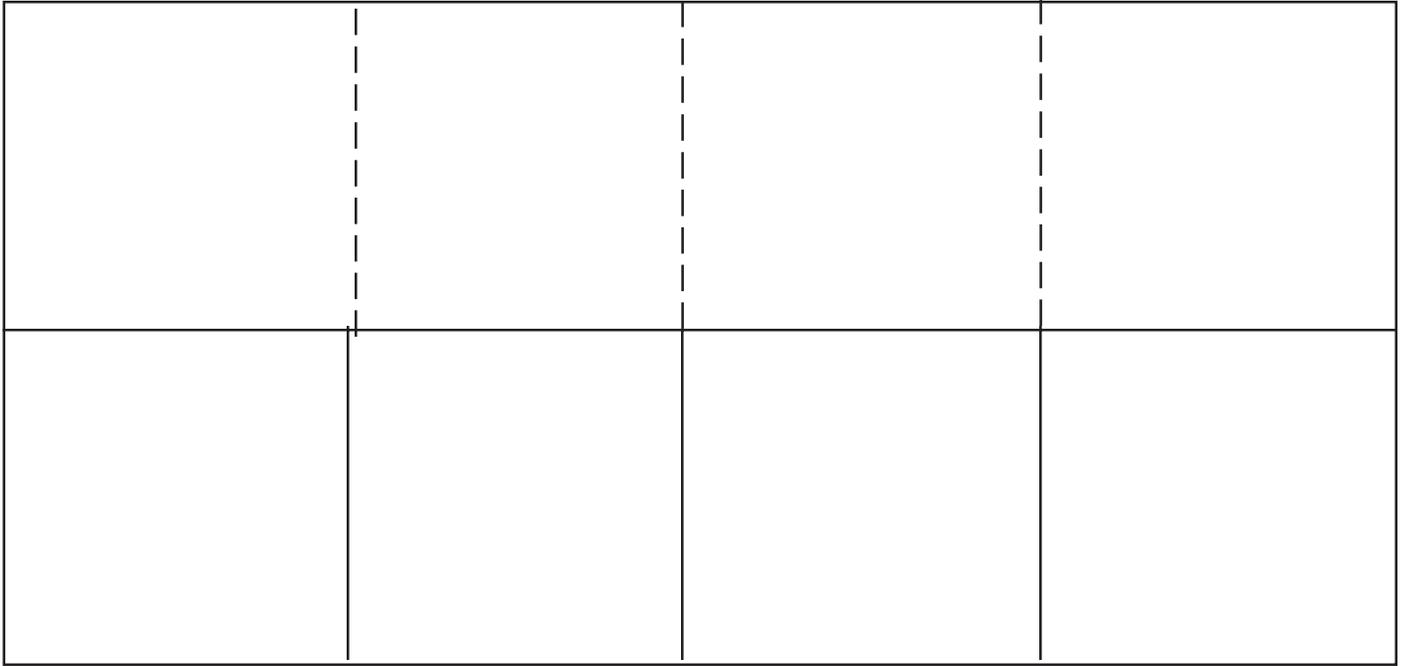
Example: If you had 3 pizzas and 18 people, each pizza would feed 6 people. That means that each person would get $\frac{1}{6}$ of a pizza!

Each person will get :

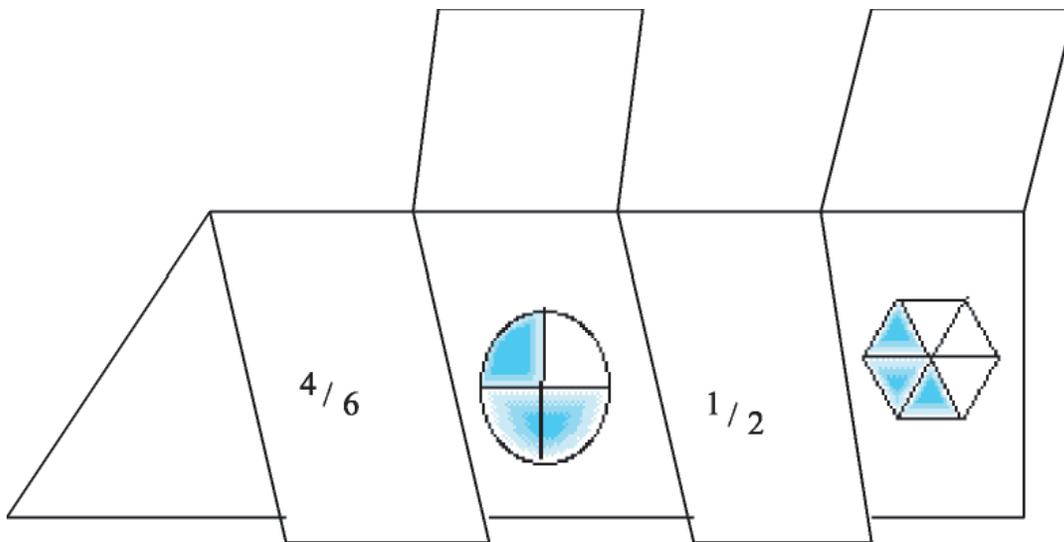
_____ pizza
_____ sub
_____ bag of chips
_____ of a cake
_____ of a 2-liter of soda

- LEVEL:** 2.0 - 3.9
- STANDARD:** 7.0 Show awareness of the ways numbers are represented and used in the real world
- BENCHMARK:** 07.03 Use objects to represent whole numbers, commonly used fractions, or mixed numbers and relate these numbers to real-world situations, e.g., $\frac{1}{4}$ pizza, $\frac{1}{2}$ sandwich, and 1 and $\frac{1}{2}$ pies.
- DESCRIPTION:** Students will be making a booklet showing their understanding of fractions. The top flap of the booklet shows their ability to write fractions and the bottom flap, their ability to shade in fractions. See teacher activity sheet for example.
- MATERIALS:** 12" x 18" paper (Heavy Card Stock), scissors, pencils, markers, glue, Pattern Blocks, overhead projector, teacher-made booklet for display (optional)
- PROCEDURE:** Model the construction of the booklet.
Pass out the materials and have the students construct their own booklets.
Have the students write the fractions on the booklet.
Then demonstrate on the overhead projector how they are to use the pattern blocks to trace and draw the shapes needed to illustrate the fraction on the outer flap.
Allow students time to write and illustrate a new fraction.
- Evaluation:** Observe as students follow directions and complete their books, making sure they are using the correct shapes and shading correctly.
- Variation:**
- Use more difficult shapes and fractions. (Example: octagon, hexagon)
 - Discuss meanings of numerator and denominator.
 - Allow students to choose and draw their own shapes.

Flip-flap Fractions



Fold paper in half lengthwise. Fold in half again. Then fold in half one more time. This should give eight sections like above example. Open and cut to center fold (note dashed lines are for cutting).



Write fraction on top flap. Illustrate under the flap

- LEVEL:** 2.0 - 3.9
- STANDARD:** 7.0 Show awareness of the ways numbers are represented and used in the real world
- BENCHMARK:** 07.03 Use objects to represent whole numbers, commonly used fractions, or mixed numbers and relate these numbers to real-world situations, e.g., $\frac{1}{4}$ pizza, $\frac{1}{2}$ sandwich, and 1 and $\frac{1}{2}$ pies.
- DESCRIPTION:** Students will use fraction pieces to make $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$. They will relate this to sharing cake then label and color fractional parts.
- MATERIALS:** Soft, round cookies, enough to demonstrate and share. Paper plate, napkins and a knife. Circle fraction pieces for each student and set for class demonstration and discussion
- PROCEDURE:** Ask students if they had a cake or cookie, how they would divide it equally with a friend, 2 friends or three friends. Call a student up to share a cookie with a classmate. Notice that when you share with a friend you want to have the same amounts. Have half the class share a cookie with the other half of the class. Explain that when we divide things into equal parts we have symbols that name these parts. Tell them that when you divide something into two equal parts each part is called a half and one of those parts is called one half ($\frac{1}{2}$), meaning one of the two parts. Explain in the same way for thirds and fourths. Pass out the activity sheet. Explain that the first picture is a picture of a whole complete circle. The picture to the right of it is divided into halves. The one underneath it is divided into thirds and the one to the right of that is divided into fourths. Have the students write the symbol for one of the parts under each picture. Ask the students to point to the picture demonstrating how they would divide a cookie for themselves and two friends. Continue asking questions and observing students .

Evaluation: If a student can complete this activity successfully, it is a positive evaluation of the skill.

Variation:

- Before eating their fractional part let them reconstruct the cake. Discuss what it would take to make it a whole cake again.
- Graph student portion sizes.
- Make a bulletin board with headings **A Whole, $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$.** Students can make different shapes drawn or traced on construction paper and cut to show a whole and the fraction. For example, squares, rectangles, triangles, circles, pattern blocks, etc.

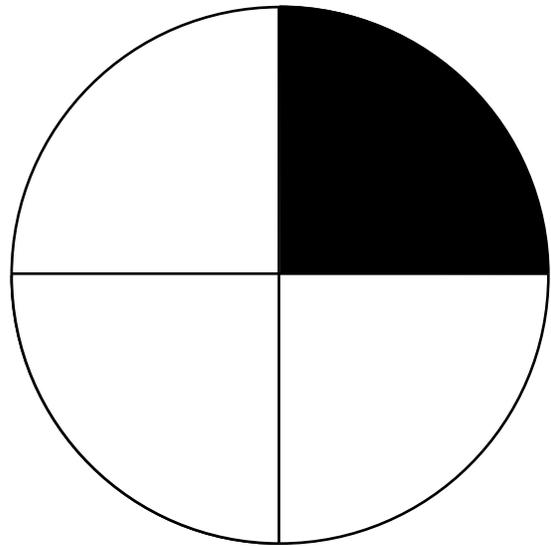
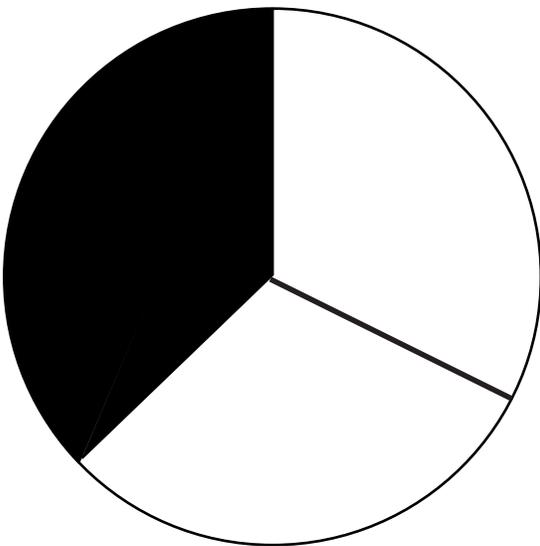
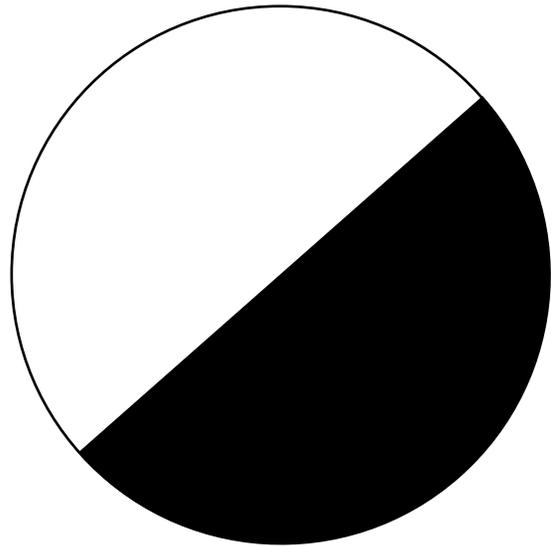
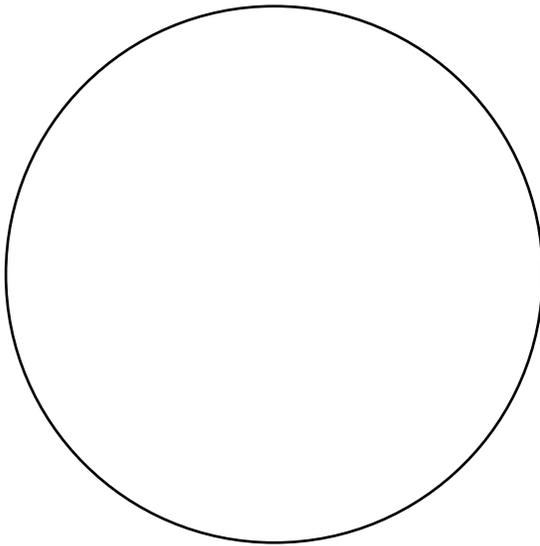
Student: _____

Date: _____

Teacher: _____

Fraction Cake Activity Sheet

Label each section of the fraction circles below. Color the part of the circle that matches the part of the cake you chose.



LEVEL:	2.0 – 3.9
STANDARD:	7.0 Show awareness of the ways numbers are represented and used in the real world
BENCHMARK:	07.03 Use objects to represent whole numbers, commonly used fractions, or mixed numbers and relate these numbers to real-world situations (for example: $\frac{1}{4}$ pizza, $\frac{1}{2}$ sandwich, 1 and $\frac{1}{2}$ pies).
DESCRIPTION:	Students will use fraction pieces to cover shaded fraction areas with an equivalent amount.
MATERIALS:	One set of fraction circles per two students; or one set at a center One activity sheet per student; or a laminated activity sheet at a learning center. Overhead transparencies of fraction circles.
PROCEDURE:	<p><i>Role of the Teacher:</i></p> <ul style="list-style-type: none">• Model one example on the overhead using the fraction circles transparencies.• Explain directions with students.• Guide students through the first problem.• Monitor during activity. <p>Evaluation: Use completed activity sheet. Have students give an equivalent fraction for the teacher created examples on the overhead or board.</p> <p><i>Role of the Students:</i></p> <p>Complete activity sheet using the fraction circles to model an equivalent form.</p>

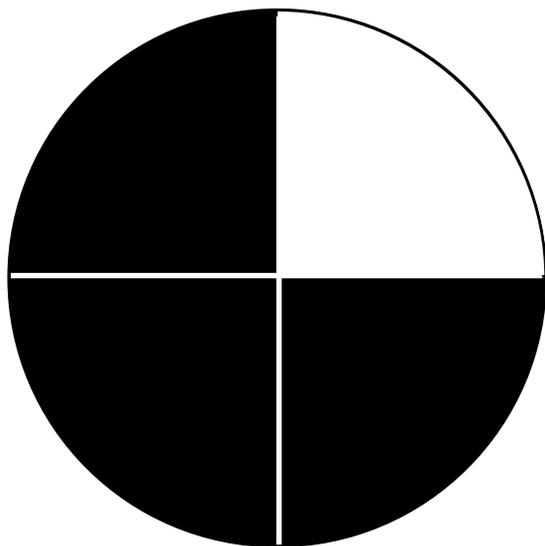
Benchmark: 07.03

Student: _____

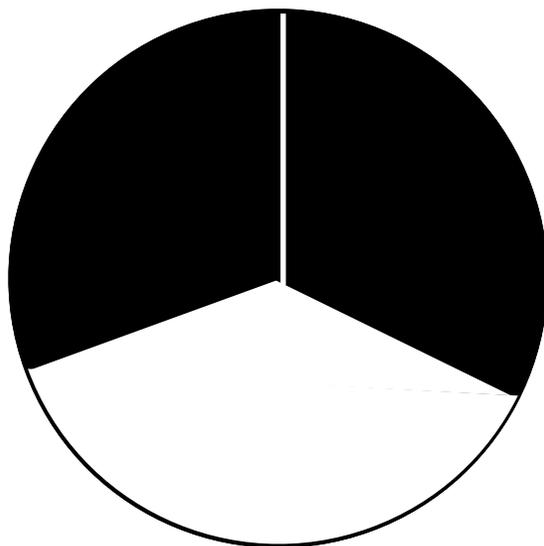
Date: _____

Teacher: _____

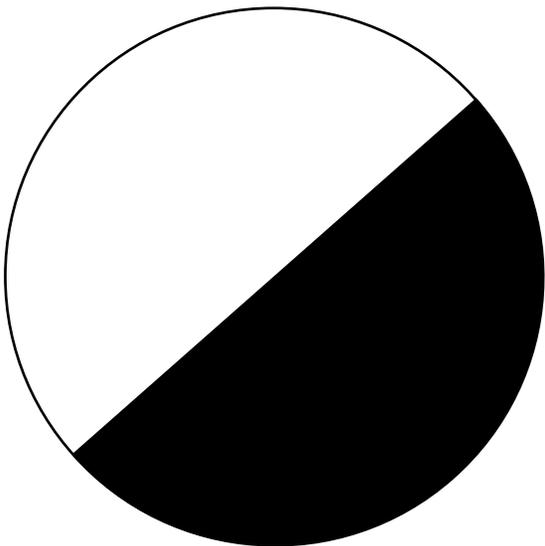
Using the same color of fraction pieces, cover the shaded area completely. Then write the equivalent fraction that is created.



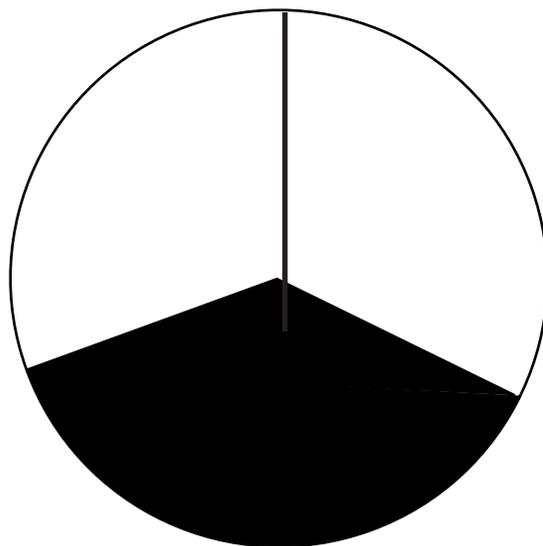
$\frac{3}{4} =$ _____



$\frac{2}{3} =$ _____



$\frac{1}{2} =$ _____



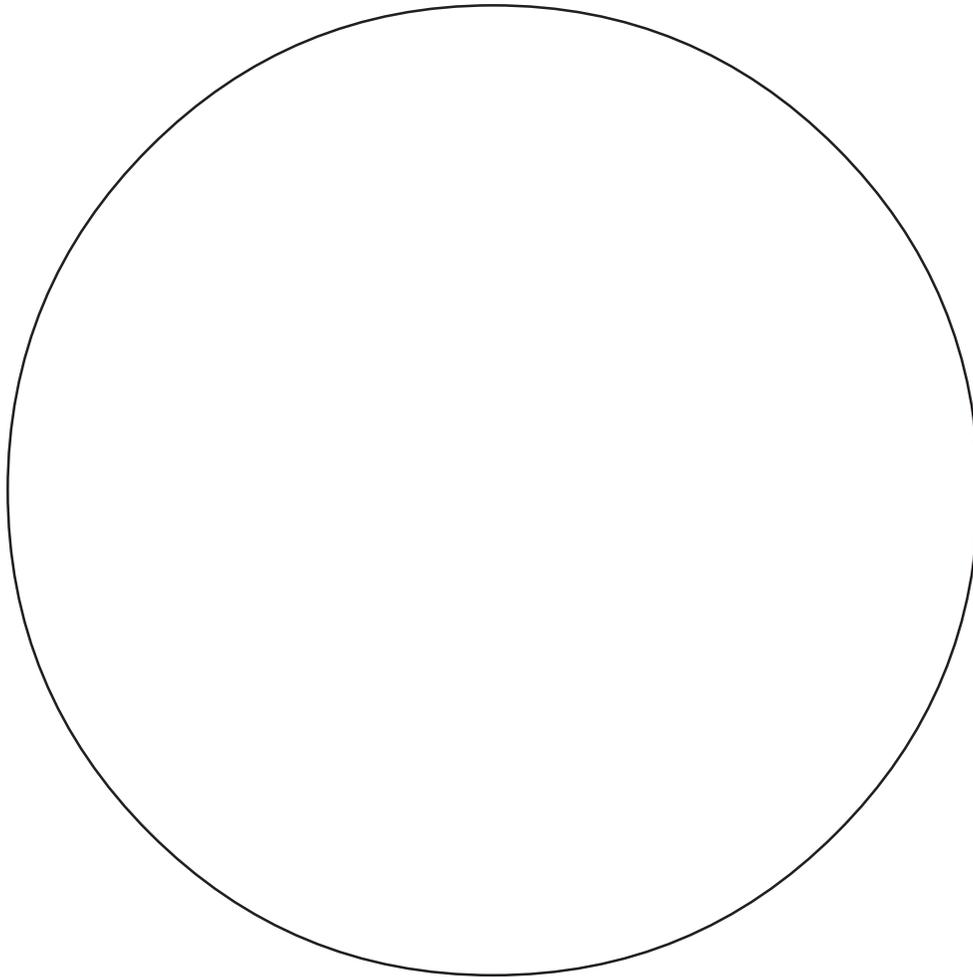
$\frac{1}{3} =$ _____

Student: _____

Date: _____

Teacher: _____

Use fraction pieces to find equivalent fractions.



$$\frac{1}{2} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \quad \frac{1}{3} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$\frac{1}{4} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \quad \frac{2}{5} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

Benchmark: 08.01

- LEVEL:** 2.0 – 3.9
- STANDARD:** 8.0 Understand number systems
- BENCHMARK:** 08.01 Understand and apply the concepts of counting by 2s, 3s, 5s, 10s, 25s and 50s.
- PURPOSE:** Counting objects by 1s, 2s, 4s, 5s, 10s
- DESCRIPTION:** The students will place cubes on a grid sheet and count objects in groups of 1s, 2s, 4s, 5s, and 10s.
- MATERIALS:** Linking cubes or colored tiles, Grid shape activity sheet, Crayons, colored pencils or pens
- TIME NEEDED:** 20 – 30 minutes
- PROCEDURE:** Example:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20

1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20

Give each student a copy of a 2 x 10 grid, a 10 x 2 grid, a 4 x 5 grid, and a 5 x 4 grid and 20 linking cubes. Model this activity first. Then have the students place the same colored cubes on each row except for the last square. Place a different color cube on the last square. Connect the cubes and remove from the grid shape. Count the cubes and write the numbers consecutively on the grid squares. Color the last square in each row. Discuss each grid and model. Talk about the number in each row and how many rows there are in each grid. Tell the students that to count by the number of cubes in each row, all you have to say is the number at the end of the row in the square that is colored. Ask what all of the grids have in common. (They all equal twenty).

Evaluation: Students can create a grid pattern for another number.

For example:

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

Count: **5 10 15 20 25**

Students repeat this counting within their groups. Check each others work.

Variation:

- Give students a random number of objects to count. Observe method of counting whether by 1s or by grouping objects.
- Have students with the 2 x 10 grids stand and count by 10s. Predict which ten would come next. Next have the students with the 4 x 5 grids stand and count by 4s. Continue until all have had a turn.

Student: _____

Date: _____

Teacher: _____

Grid Shape Activity Sheet

(Grids should be enlarged to match size of cubes or tiles)

2x10 and 10x2

Student: _____

Date: _____

Teacher: _____

Grid Shape Activity Sheet

(Grids should be enlarged to match size of cubes or tiles)

4x5 and 5x4

LEVEL: 2.0 – 3.9

STANDARD: 8.0 Understand number systems

BENCHMARK: 08.01 Understand and apply the concepts of counting by 2s, 3s, 5s, 10s, 25s and 50s.
08.03 Classify a number as even or odd.

MATERIALS: Hundreds Chart handout, pen or pencil and markers

PROCEDURE: Give each student a Hundreds Chart.
Next select the colors and code all the numbers used when counting by 2, 3, 5, 10, 25, and 50.

- Color 10's blue
- Colors 5's green
- Color 2's pink
- Color all the rest of the numbers yellow

Ask students to identify the color pattern for counting by 2's, 3's, 5's, 10's, 25's and 50.

Choose a color pattern and have the students tell what number you are counting by.

Student: _____

Date: _____

Teacher: _____

Hundreds Chart

Answer Key**Hundreds Chart**

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

LEVEL:	2.0 – 3.9
STANDARD:	8.0 Understand number systems
BENCHMARK:	08.02 Understand place value for hundreds, tens, ones, tenths, and hundredths.
MATERIALS:	Place Value Awareness Charts
PROCEDURE:	<p>It is important to make place value charts visible at all times for adults. The following two charts may be copied and placed on the walls of the classroom; each student may receive his/her own copy. Students should be able to refer to these charts at all times. It is also helpful for students to hear and say numbers using the place value language (hundreds, tenths, etc.)</p>

Student: _____

Date: _____

Teacher: _____

Place Value Awareness Chart

6,

MILLIONS

5

HUNDRED THOUSANDS

3

TEN THOUSANDS

4,

THOUSANDS

8

HUNDREDS

9

TENS

2

ONES

Student: _____

Date: _____

Teacher: _____

Place Value Awareness Chart

6,	5	3	4,	8	9	2	.	1	4	8	7	6	5
MILLIONS	HUNDRED THOUSANDS	TEN THOUSANDS	THOUSANDS	HUNDREDS	TENS	<u>ONES</u>	AND	TENTHS	HUNDREDTHS	THOUSANDTHS	TEN THOUSANDTHS	HUNDRED THOUSANDTHS	MILLIONTHS

LEVEL:	2.0 – 3.9
STANDARD:	08.0 Understand number systems
BENCHMARK:	08.02 Understand place value for hundreds, tens, ones, tenths, and hundredths.
DESCRIPTION:	Using color coded numeric cards, students will identify place value with decimal points.
MATERIALS:	Colored index cards or number cards to represent the place values
PROCEDURE:	<p>Prepare six sets of cards that match the card code on the activity sheet. Divide your students into groups of six and give each person in the group a different color coded card. Write a number on the board that matches one of the groups number. Have the group form the number with their cards.</p> <p>Evaluation: Teacher observation and feedback from students.</p> <p>Variation: Increasing or decreasing place values</p>

Student: _____

Date: _____

Teacher: _____

DANCING DECIMALS

Mrs. Demoss' class has been studying place value using whole numbers and decimals. She has a total of 30 students. There are 5 rows with 6 students in each row. Each row is given a set of six cards which contains a numeric symbol. Each card also represents a different place value. The cards are as follows:

- Red card—stands for ones
- Green card—stands for tenths
- Yellow card— stands for hundreds
- Orange card—stands for decimal point
- Pink card—stands for tens
- Blue card—stands for hundredths

The teacher writes and then reads a number that is written on the board. The students look at their card to check the numeric symbol that is on it. Then, those students who possess any of the numeric symbols written on the board will stand in front of the class in the order that their number appears on the board.

The teacher will go through this process until all students have been given a chance. Then the students will be allowed to exchange cards and students randomly will write similar numbers on the board. The class will respond accordingly.

(If you do not have the number of students as stated in the narrative, modify as needed.)

LEVEL:	2.0 – 3.9
STANDARD:	8.0 Understand number systems
BENCHMARK:	08.02 Understand place value for hundreds, tens, ones, tenths, and hundredths.
DESCRIPTION:	Students will be able to group counters according to hundreds, tens and ones places. Whenever a total of ten counters appear on the ones side, they are put in a cup and moved to the tens side and called ten . The ones left behind are ones. For example: The number 13 would be read as 1 ten and 3 ones.
MATERIALS:	Place value mats (activity sheet), 11 or more cups (large enough to hold the counters) per student as needed to complete the activity, Beans, marbles, stones, etc. to use as counters, Place value mat transparency, Overhead projector, Bell, Number cards
PROCEDURE:	<ul style="list-style-type: none">• Pass out place value mat, nut cups, and counters (beans, marbles, stones, etc.).• Students will be placed in pairs.• Teacher will demonstrate counting by 1's on the place value mat transparency. Students will model on their mats as teacher demonstrates on overhead. For example, put 5 beans in ones place on overhead transparency. Add 1 bean at a time until there are 10 beans on overhead. Put the 10 bean counters in a nut cup and put in the tens place and when there are ten cups in the tens place, pour all the beans from each cup into one cup and place in the hundreds place. When each "cup" is moved ring a bell. Read each new number as beans are added. Throughout the activity instruct students to check their partner's mat.• After several examples of above are demonstrated give students a number card to demonstrate on their mats. For example: 8, 12, 15, 46, 115, 127, 220, etc. <p>Evaluation Teacher observation of each student's activity mat. Ask students to explain why they grouped counters.</p>

Continued

Variation:

- Reverse the process by giving a target one, two or three digit number.
- Students will show the number by placing beans on their place value mat.
- Then they are instructed to take away 1, 2, or 3 beans each time.
- When adding or subtracting use any number to add or take away beans.
- Thousands place can be added to mat. A larger container would be used to hold the 10 previous containers.

Student: _____

Date: _____

Teacher: _____

PLACE VALUE MAT

HUNDREDS	TENS	ONES

Student: _____

Date: _____

Teacher: _____

PLACE VALUE MAT

TENS	ONES	TENTHS	HUNDREDTHS

Student: _____

Date: _____

Teacher: _____

PLACE VALUE MAT

THOUSANDS	HUNDREDS	TENS	ONES

Benchmark: 08.02

Student: _____

Date: _____

Teacher: _____

LEVEL: 2.0 – 3.9

STANDARD: 8.0 Understand number systems

BENCHMARK: 08.02 Understand place value for hundreds, tens, ones, tenths, and hundredths.

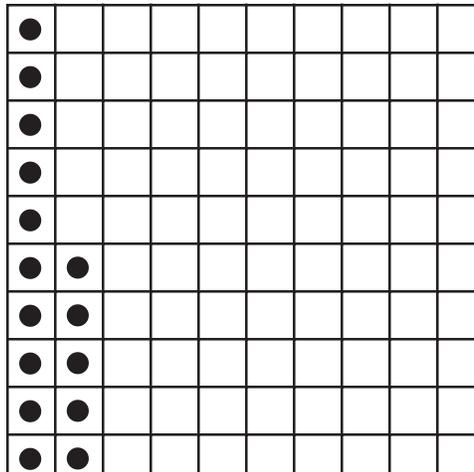
DESCRIPTION: This activity is done in groups of four. The students will take pennies from a box and count, write as a fraction, write as a decimal, show using base ten blocks, and shade in the amount on base ten patterns. As each student performs his task he will record his answer on the group activity sheet. Make sure students take turns performing each task.

MATERIALS: Base ten flats (hundreds), Activity sheet (one per group), Boxes of pennies (or an appropriate representation for one cent)

PROCEDURE: Model this activity first. Divide the students into groups of four. Distribute activity sheets, colored pencils and 100 pennies per group. Each student will take a turn at grabbing a handful of pennies from the container and counting them. Everyone will record the number of pennies on the first line on the top left side of the activity sheet. Then color the grid to represent the amount of pennies taken from the container. Then fill in the rest of the answers for the grid. Complete all grids on the sheet.

For example: Number of pennies = 15
Written as a fraction = $\frac{15}{100}$
Written as a decimal = .15

Shade in base ten pattern for decimal



Student: _____

Date: _____

Teacher: _____

Penny Pinchers

Number of pennies _____

Written as a fraction _____

Written as a decimal _____

Shade in base ten pattern for decimal.

Number of pennies _____

Written as a fraction _____

Written as a decimal _____

Shade in base ten pattern for decimal.

Number of pennies _____

Written as a fraction _____

Written as a decimal _____

Shade in base ten pattern for decimal.

Number of pennies _____

Written as a fraction _____

Written as a decimal _____

Shade in base ten pattern for decimal.

LEVEL: 2.0 - 3.9

STANDARD: 9.0 Compute addition and subtraction problems

BENCHMARK: 09.01 Understand and explain the inverse (opposite) relationship between addition and subtraction.

MATERIALS: Bag of additions and subtractions (See handout)

DIRECTIONS: Divide the class into 5 groups. Groups each pick one representative for the foot race.

Clear five rows of floor tiles from the front of the room to the back of the room. If you do not have floor tiles you can use heel-to- toe steps. Have the foot racers line up in the back of the room, claiming a row of tiles.

Prepare a bag full of additions and subtractions (see handout). Have the first person in each group (go in alphabetical order) pick a number out of the bag without looking. If it is a + number then the representative moves forward that many floor tiles. If it is a – number then the racer moves backwards that many floor tiles. Take turns with the rest of the group choosing a + or – and moving their racer. First one to the front of the room wins.

Instead of numbers in a bag, you can use 2 dice. Roll one. If it is even then the racer moves forward and if it is odd the racer moves backwards. Roll the second die for the amount of tiles to move.

Cut these up, fold in half, and put them in a bag.

+1	+2	+3	+4	+5	+6
+1	+2	+3	+4	+5	+6
-1	-2	-3	-4	-5	-6
-1	-2	-3	-4	-5	-6
+1	+2	+3	+4	+5	+6
-1	-2	-3	-4	-5	-6

LEVEL: 2.0 - 3.9

STANDARD: 0.90 Compute addition and subtraction problems

BENCHMARK: 09.02 Add whole numbers to solve real-world problems using appropriate methods of computing; such as manipulatives, mental mathematics, and paper and pencil.

09.03 Subtract whole numbers to solve real-world problems using appropriate methods of computing; such as manipulatives, mental mathematics and paper and pencil.

DESCRIPTION: Students will use 2 groups of colored cubes, squares or tiles and make all the possible combinations.

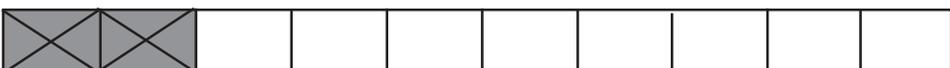
MATERIALS: Colored cubes, squares, or tiles,
Crayons, markers, colored pencils or pens

PROCEDURES:

- Select 7 squares or more using no more than two colors, for example 2 blue and 5 yellow.
- Demonstrate all the addition and subtraction facts using the 7 or more squares.
- Record answers on activity sheet. Repeat using a different set of cubes.

Evaluation Teacher observation. Activity sheet.

For example:

	$2 + 5 = 7$
	$5 + 2 = 7$
	$7 - 5 = 2$
	$7 - 2 = 5$
	$10 - 2 = 8$
	$8 + 2 = 10$

Continued

Variation:

- Change specified number of cubes (12, 15, 20 etc.) Subtract and/or add 1 or 2 digit number from a 2 digit number.
- Change the activity sheet to match the number of cubes or squares required to do the activity
- Use dominoes to write number families

Student: _____ Date: _____

Teacher: _____

Number Families Activity Sheet

Color in the squares the same color of the cubes or squares you've chosen. Remember to use two different colors. Add the numbers together.

--	--	--	--	--	--	--	--	--	--

_____ + _____ = _____

--	--	--	--	--	--	--	--	--	--

_____ + _____ = _____

Place a large X in the number of squares to be subtracted. Color the squares left and record.

--	--	--	--	--	--	--	--	--	--

_____ - _____ = _____

--	--	--	--	--	--	--	--	--	--

_____ - _____ = _____

LEVEL: 2.0 - 3.9

STANDARD: 09.0 Complete addition and subtraction problems
14.0 Recognize a wide variety of patterns, relations and functions

BENCHMARK 09.03 Subtract whole numbers to solve real-world problems using appropriate methods of computing; such as, manipulatives, mental mathematics, and paper and pencil.

14.01 Recognize symbols and concepts of equal (=) and unequal (\neq) and less than (<) and greater than (>).

MATERIALS: Subtracting Whole Numbers worksheet

DIRECTIONS: Have students complete the worksheet working alone. When they are finished, have them check their answers with another student. Choose students to present problems and solutions to the class.

ANSWER KEY: *Subtract the numbers below. Check the answers using addition.*

1. 25
2. 34
3. 23
4. 40
5. 4
6. 155
7. 474
8. \$358
9. 11
10. \$225
11. 44
12. \$40
13. 63
14. a. $21 - 6 = 15$
b. $15 + 6 = 21$
c. $21 > 15$
d. $15 < 21$
e. $15 \neq 21$

Student: _____

Date: _____

Teacher: _____

Subtracting Whole Numbers

Subtract the numbers below. Check the answers using addition.

1. $53 - 28 = \underline{\hspace{2cm}}$

2.
$$\begin{array}{r} 50 \\ - 16 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 48 \\ - 25 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 72 \\ - 32 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 52 \\ - 48 \\ \hline \end{array}$$

6. $426 - 271 = \underline{\hspace{2cm}}$

7. $899 - 425 = \underline{\hspace{2cm}}$

8. Jaime was balancing his checkbook. His starting balance was \$650. He wrote checks for \$125, \$89, \$57, and \$21. What was Jaime's ending balance?
9. Caryl works at a bookstore. She needs to order a total of 120 books from different publishers. She ordered 43 books on Monday, 54 book on Tuesday, and 12 books on Wednesday. How many more books does she want to order?
10. Paula's take-home pay is \$1,200 a month. She pays \$450 a month for rent and \$225 a month for food. How much more does she pay for rent than food?
11. Sandra is a records clerk. This week she handles requests for 67 marriage certificates, 73 birth certificates, and 81 death certificates. Last week she handled requests for 89 marriage certificates, 54 birth certificates, and 34 death certificates. How many more did she handle this week than last week?

Student: _____ Date: _____

Teacher: _____

12. Ann bought a suit on sale for \$175. The regular price was \$215. How much did she save by buying it on sale?

13. John planted 78 trees. 15 trees dies. How many trees lived?

14. **Complete each number sentence to make it true.**

a. Joe saved \$6 less than Tess. $\frac{\quad}{\text{Tess}} - \frac{\quad}{\text{number}} = \frac{15}{\text{Joe}}$

b. Tess saved \$6 more than Joe. $\frac{15}{\text{Joe}} + \frac{\quad}{\text{number}} = \frac{21}{\text{Tess}}$

c. Tess saved a greater amount of money than Joe $\frac{\quad}{\text{Tess}} > \frac{\quad}{\text{Joe}}$

d. Joe saved a lesser amount of money than Tess. $\frac{\quad}{\text{Joe}} < \frac{\quad}{\text{Tess}}$

e. Joe and Tess did not save the same amount of money. $\frac{\quad}{\text{Joe}} \quad \frac{\quad}{\text{symbol}} \quad \frac{\quad}{\text{Tess}}$

Answer Key**Subtracting Whole Numbers**

Subtract the numbers below. Check the answers using addition.

1. $53 - 28 = \underline{25}$

2.
$$\begin{array}{r} 50 \\ - 16 \\ \hline 34 \end{array}$$

3.
$$\begin{array}{r} 48 \\ - 25 \\ \hline 23 \end{array}$$

4.
$$\begin{array}{r} 72 \\ - 32 \\ \hline 40 \end{array}$$

5.
$$\begin{array}{r} 52 \\ - 48 \\ \hline 4 \end{array}$$

6. $426 - 271 = \underline{155}$

7. $899 - 425 = \underline{474}$

8. Jaime was balancing his checkbook. His starting balance was \$650. He wrote checks for \$125, \$89, \$57, and \$21. What was Jaime's ending balance?

\$358

9. Caryl works at a bookstore. She needs to order a total of 120 books from different publishers. She ordered 43 books on Monday, 54 book on Tuesday, and 12 books on Wednesday. How many more books does she want to order?

11

10. Paula's take-home pay is \$1,200 a month. She pays \$450 a month for rent and \$225 a month for food. How much more does she pay for rent than food?

\$225

11. Sandra is a records clerk. This week she handles requests for 67 marriage certificates, 73 birth certificates, and 81 death certificates. Last week she handled requests for 89 marriage certificates, 54 birth certificates, and 34 death certificates. How many more did she handle this week than last week?

44

Answer Key

12. Ann bought a suit on sale for \$175. The regular price was \$215. How much did she save by buying it on sale?

\$40

13. John planted 78 trees. 15 trees dies. How many trees lived?

63

14. Joe saved \$15, and Tess saved \$21. Tess saved how many more dollars than Joe?

Complete each number sentence to make it true.

a. Joe saved \$6 less than Tess. $\frac{21}{\text{Tess}} - \frac{6}{\text{number}} = \frac{15}{\text{Joe}}$

b. Tess saved \$6 more than Joe. $\frac{15}{\text{Joe}} + \frac{6}{\text{number}} = \frac{21}{\text{Tess}}$

c. Tess saved a greater amount of money than Joe $\frac{21}{\text{Tess}} > \frac{15}{\text{Joe}}$

d. Joe saved a lesser amount of money than Tess. $\frac{15}{\text{Joe}} < \frac{21}{\text{Tess}}$

e. Joe and Tess did not save the same amount of money. $\frac{15}{\text{Joe}} \neq \frac{21}{\text{Tess}}$

Benchmark: 10.01, 10.02, 10.03, 10.06, 10.07, 10.08

LEVEL: 2.0 - 3.9

STANDARD: 10.0 Compute multiplication and division problems

BENCHMARK: 10.01 Understand and explain the effect of multiplication on whole numbers.
10.02 Identify multiplication terminology and symbols.
10.03 Recall multiplication facts using a table or memory.
10.06 Identify division terminology and symbols.
10.07 Understand the inverse relationship between multiplication and division.
10.08 Recall division facts using memory or a table.

MATERIALS: Multiplication Chart (sample follows); Dienne's Blocks (see Standard 3)

PROCEDURE: Try to expose your students to multiplication and division to your students in as many forms as possible.

1. Use the overhead to show how multiplication works using Dienne's Blocks.
2. Demonstrate writing and grouping lines so students can count multiplication or division problems. For example: Write 3×4 as three sets of four or IIII IIII IIII.
3. Have students fill out the multiplication chart. If color-coding was helpful in counting by multiples, have them color-code again. Explain how the chart can be used for division because division is the opposite of multiplication.
4. To explain long division to students, teach them the following mnemonic device:

Dad	Mom	Sister	Brother
Divide	Multiply	Subtract	Bring Down

First the students need to **divide** the **divisor** into the first two numbers. Then they **multiply** the number in the **quotient** with the **divisor**. Then they **subtract**, then they **bring down**. Then they start all over again until the problem is finished.

Benchmark: 10.01, 10.02, 10.03, 10.06, 10.07, 10.08

Student: _____

Date: _____

Teacher: _____

Multiplication Chart

	0	1	2	3	4	5	6	7	8	9	10	11	12
0													
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

Answer Key**Multiplication Chart**

	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	16	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

Benchmark: 10.02, 10.06, 11.01

LEVEL: 2.0-3.9

STANDARD 10.0 Compute multiplication and division problems
11.0 Apply math skills in word problem applications

BENCHMARK 10.02 Identify multiplication terminology and symbols.
10.06 Identify division terminology and symbols.
11.01 Recognize clue words for choosing operations to be used to solve real-world problems, e.g., add, plus, total, sum, subtract, difference, left, remaining, multiply, times, several, divide, each, and per.

MATERIALS: "A Picture is Worth a Thousand Words" handout

PROCEDURES: Pass out handout and have a student or two read the first half of the first page out loud. Discuss translations and go over a few more examples. Have students complete the handout.

VARIATIONS: Have students make up their own word problems and let other students translate and solve them.

ANSWER KEY:

Underline the words that translate into a math symbol.

1. If you triple five the result is fifteen.
2. The product of four and ten is forty
3. $\frac{2}{3}$ of six is four.
4. 3 copies of each of 36 photos is 108 photos altogether.
5. Sixteen multiplied by four is sixty-four
6. Rosa has 10 boxes of 24- crayon boxes. How many crayons does she have in all?
7. The product of 3 and x added to the product of 5 and y.
8. Three times the number y subtracted from twenty.

Now try and translate the symbols and numbers into words.

Answers will vary

9. $5 \times 7 = 35$
Five times seven is thirty-five, the product of five and seven is thirty-five.
10. $20 \times 1 = 20$
Twenty multiplied by one is equal to twenty; the product of twenty and one is twenty
11. $(40)(2) = 80$
Eighty is the product of forty and two, multiply forty by two and the result is eighty

Try and write a word problem for each of the expressions above (9 – 11)

Answers will vary

- Ex: $3 \times 2 = 6$ Davis has three pairs of shoes. How many shoes does he have in all?
12. Five boys are running the track seven times each. How many total laps will be run?
 13. Donnie has one box of candy with twenty pieces in it. How many pieces does he have in all?
 14. Javonne invited 40 couples to his party. How many people is he expecting?

Student: _____

Date: _____

Teacher: _____

A Picture is Worth a Thousand Words

In math, pictures or symbols are often used to express ideas that would be awkward using words. We use 3 instead of *three*, and = instead of *equal to*. Your ability to move from words to number, symbols, and pictures will help you solve many kinds of math problems.

When translating from words to mathematical expressions you look for key words that can be aids in setting up problems.

Example:

$3 + 4 = 7$; three *plus* four *equals* seven
 Three *added to* four *is* seven
 The *sum of* three and four *is* seven

So, we see that plus, added to and the sum of mean + and equals and is means =.

Let's deal strictly with multiplication. Here are some words that indicate multiplication.

Twice, times, of, tripled, product of

Combine these with the word that means equals to and you can translate mathematical expressions.

Underline the words that translate into a math symbol.

1. If you split four into two parts the result is two.
2. The quotient of fourteen and seven is two.
3. $\frac{2}{3}$ divided by six is $\frac{1}{9}$.
4. There are 30 students and you have 90 cokes. How many cokes per student?
5. 9 problems per each 3 – minute period is 3 problems per minute.
6. If Mason paid 60 cents for 12 pencils, how much did he pay per pencil?

Continued

Benchmark: 10.02, 10.06, 11.01

Student: _____

Date: _____

Teacher: _____

7. The product of 3 and x divided by the product of 5 and y .
8. The quotient of three times the number y and twenty.

Now try and translate the symbols and numbers into words.

9. $5 \times 7 = 35$

10. $20 \times 1 = 20$

11. $(40)(2) = 80$

Try and write a word problem for each of the expressions above (9 – 11)

Ex: $3 \times 2 = 6$ Davis has three pairs of shoes. How many shoes does he have in all?

12.

13.

14.

Answer Key**A Picture is Worth a Thousand Words**

In math, pictures or symbols are often used to express ideas that would be awkward using words. We use 3 instead of *three*, and = instead of *equal to*. Your ability to move from words to number, symbols, and pictures will help you solve many kinds of math problems.

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 Three *added to* four *is* seven
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So, we see that plus, added to and the sum of mean + and equals and is means =.

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2. The product of four and ten is forty
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4. 3 copies of each of 36 photos is 108 photos altogether.
5. Sixteen multiplied by four is sixty-four
6. Rosa has 10 boxes of 24- crayon boxes. How many crayons does she have in all?

Continued

Answer Key

7. The product of 3 and x added to the product of 5 and y.
8. Three times the number y subtracted from twenty.

Now try and translate the symbols and numbers into words.

Answers will vary

9. $5 \times 7 = 35$
Five times seven is thirty-five, the product of five and seven is thirty-five.
10. $20 \times 1 = 20$
Twenty multiplied by one is equal to twenty; the product of twenty and one is twenty
11. $(40)(2) = 80$
Eighty is the product of forty and two, multiply forty by two and the result is eighty

Try and write a word problem for each of the expressions above (9 – 11)

Answers will vary

Ex: $3 \times 2 = 6$ Davis has three pairs of shoes. How many shoes does he have in all?

12. Five boys are running the track seven times each. How many total laps will be run?
13. Donnie has one box of candy with twenty pieces in it. How many pieces does he have in all?
14. Javonne invited 40 couples to his party. How many people is he expecting?

- LEVEL:** 2.0 - 3.9
- STANDARD:** 10.0 Compute multiplication and division problems
- BENCHMARK** 10.4 Multiply a 2-digit number by a 1-digit number without regrouping, and multiply three 1-digit numbers.
- MATERIALS:** Bingo game card if available (if not have students make a 5 x 5 grid on their paper with an example on the board) clear space markers (torn up pieces of paper will work fine, but M&M s would be the most fun).
- DIRECTIONS:** Write the following numbers on the board or overhead.
36, 20, 15, 30, 300, 77, 28, 120, 215, 81, 39, 225, 64, 36, 108, 60, 100, 297, 637, 592, 192, 172, 45, 90, 0, 6, 120, 24, 20, 72, 30
Have students pick 24 of these numbers and fill in their bingo cards.
Cut out and mix up the multiplication problems (on handout). Use these for calling out problems. You call the problem and the students multiply it and cover the place if they have it on their card. First one to fill a line vertically, horizontally, or diagonally **wins!** A small prize goes over real well and encourages students to keep playing.
- VARIATION:** *You can play blackout where they have to cover the whole card.
*You can call out the answers and have them find the problem on their card. This version would require you to list the problems on the board and the answers on the call out cards.

Student: _____

Date: _____

Teacher: _____

Multiplication BINGO

Bingo card.

B	I	N	G	O
		FREE		

Multiplication BINGO Cards

$12 \times 3 = 36$	$10 \times 2 = 20$	$15 \times 1 = 15$	$15 \times 2 = 30$	$50 \times 4 = 200$
$64 \times 3 = 192$	$11 \times 7 = 77$	$14 \times 2 = 28$	$15 \times 8 = 120$	$43 \times 5 = 215$
$27 \times 3 = 81$	$43 \times 4 = 172$	$13 \times 3 = 39$	$75 \times 3 = 225$	$16 \times 4 = 64$
$18 \times 2 = 36$	$42 \times 2 = 84$	$15 \times 3 = 45$	$15 \times 4 = 60$	$25 \times 4 = 100$
$33 \times 9 = 297$	$91 \times 7 = 637$	$74 \times 8 = 592$	$30 \times 3 = 90$	$49 \times 0 = 0$
$3 \times 1 \times 1 = 3$	$4 \times 5 \times 6 = 120$	$3 \times 4 \times 2 = 24$	$5 \times 2 \times 2 = 20$	$4 \times 6 \times 3 = 72$
$2 \times 3 \times 5 = 30$				

LEVEL: 2.0 - 3.9

STANDARD 10.0 Compute multiplication and division problems

BENCHMARK 10.05 Understand and explain the effect of division on whole numbers

10.09 Divide a 2-digit number by a 1-digit number where the quotient is a whole number (no remainder).

MATERIALS: Division worksheet

DIRECTIONS: Talk about the effect of division on whole numbers using real-life examples:

- 30 students divided by 6 gives you groups of 5 that can do cooperative learning
- A pizza divided into 4 parts gives you less to eat. Imagine the size of a slice when the pizza is divided into 8 pieces or 12 pieces.
- If you are waiting to ride a roller coaster and you get to the ride and the line divides into 10 smaller lines, you get to ride faster.

Have the students give examples where division really makes a difference.

Hand out the division worksheet and have students complete it.

ANSWER KEY:

1. 17
2. 7
3. 19
4. 15
5. 5
6. 30
7. 12
8. 21
9. 31

Adapting to change is the essential ingredient for survival.

Student: _____ Date: _____

Teacher: _____

Division Worksheet

Some of the words in the box, when unscrambled, form a wise saying. Here is how to find it: First solve the problems and write the answers on the lines, then find the answers in the Word Box below. The word above the first answer is the first word in the saying, the second word is above the second answer, and so on.

1. $34 \div 2 =$ _____

2. $56 \div 8 =$ _____

3. $190 \div 10 =$ _____

4. $225 \div 15 =$ _____

5. $300 \div 60 =$ _____

6. $210 \div 7 =$ _____

7. $144 \div 12 =$ _____

8. $546 \div 26 =$ _____

9. $279 \div 9 =$ _____

Word Box:

FOR 21	ANIMALS 35	LARGE 64	ESSENTIAL 30	BIG 18
ARE 24	WE 4	ADAPTING 17	BEING 90	WISE 87
TO 7	PREHISTORIC 102	CHANGE 19	MEAT 6	HUGE 13
THE 5	ALWAYS 23	INGREDIENT 12	SURVIVAL 31	HOPE 1
SKILLED 0	HELPFUL 39	FRIENDS 40	IS 15	NEW 51

_____.

Benchmark: 11.01, 11.03, 11.04

LEVEL:	2.0 - 3.9
STANDARD	11.0 Apply math skills in word problem applications
BENCHMARK	11.01 Recognize clue words in choosing operations to be used to solve real-world problems (for example: add, plus, total, sum, subtract, difference, left, remaining, multiply, times, several, divide, each, per). 11.03 Recognize that all math has only four operations: addition, subtraction, multiplication, and division. 11.04 Select the appropriate operation to solve specific problems involving addition, subtraction, multiplication, and division.
DESCRIPTION:	Teacher will read stories to students and students will hold up the plus, minus, multiplication, or division symbol as appropriate to the story. Students will also write out the problem to justify the answer.
MATERIALS:	Operation Signs for each student (+, -, x, and ÷). Story problems for teachers
PROCEDURE:	<i>Role of the Teacher:</i> Give each a copy of the activity sheet with the operation signs Read story problems (teachers should create additional stories) <ol style="list-style-type: none">1. Tommy had six pieces of gum. Sue had five. How can they find out how many total pieces they have? Show the sign. (+)2. Jim has twelve pies in a box when he returns home one evening after work. He had left three at his mother's house earlier that day during lunch. He wants to know how many total he had. Does he add or subtract? Show the sign. (+)3. Maria has 21 cookies to share with her students. There are 7 students in Maria's class. How can Maria find out how many cookies each student will have? Show the sign. (÷)4. There were 20 cars in the parking lot. Nine of the cars left. How many cars are remaining? Which sign would we use to find out? Show the sign.(-)5. For the Fourth of July Parade, each student in Ms. Jones' class will carry 2 flags. There are 11 students in the class, what is the total number of flags Ms. Jones' class will need? Show the sign. (x)6. Tim bought 24 boxes to mail 48 balls and 24 baseball mitts. How many balls and baseball mitts per box. Divide or Multiply? Show the sign. (÷)7. Helen has to make several trips to the water fountain to fill her container for watering plants. Helen has 18 plants; her container holds enough water for 3 plants at a time. How many trips will Helen have to make before she has watered all her plants? Divide or Multiply? Show the sign. (÷)

Continued

Suggested comprehension questions:

- “Why would you use a plus, minus, multiplication or division sign for this problem?”
- “Can you change this story in order to use another sign?”

Evaluation:

The teacher will observe the students as they work.

- Students will be able to articulate reasons for using a particular sign.
- Students will be able to modify the story to use the inverse operation.
- Students will illustrate the story problem.

Role of the Students:

- Students will listen to stories and hold up the sign to indicate the operation.
- Students will find the answer and model to justify.
- Students will justify why the operation is appropriate for that story.

Variation:

- Have students write a number sentence or word problem that goes along with the operation.

+

-

X

÷

Benchmark: 11.01, 11.02, 11.03, 11.04

LEVEL: 2.0 – 3.9

STANDARD: 11.0 Apply math skills in word problem applications

- BENCHMARK:**
- 11.01 Recognize clue words for choosing operations to be used to solve real-world problems, e.g., add, plus, total, sum, subtract, difference, left, remaining, multiply, times, several, divide, each, and per.
- 11.02 Explain the reasoning steps in solving real-world problems by:
- determining the question
 - identifying the information given
 - deciding on the operation
 - working and checking
 - making certain the answer is logical
- 11.03 Recognize that all math has only four operations: addition, subtraction, multiplication and division.
- 11.04 Select the appropriate operation to solve specific problems involving addition, subtraction, multiplication and division.

MATERIALS: Word Problems the Zengler Way Worksheet

- PROCEDURE:**
- 1.) Have students brainstorm words or phrases that indicate when to add, subtract, multiply, and or divide. Make a list to hang in the classroom. Have a student type up the words to hand out to all students.
- 2.) Go over steps to word problems. This set of directions is from *Changing Approaches to Math* by Cynthia Zengler, which can be found in this Resource Guide.
- Read the problem.
Decide what to do.
Solve the problem.
Answer the question.

The second step is the hardest for most students. Zengler suggests asking these three questions to help students focus their thinking: What do you want to find? What do you know? How are they related?

Teaching how to do the calculations is important, but the word problems are much more important. Not only is that what is found on the GED, it's what is found in life. Rarely does someone outside of a classroom give you a math problem to do; however, often you face situations where you must use math to successfully solve your problem.

Continued

The last step (answer the question) is hard to explain to students. They think they have already completed this when they did the math, but they must reread the question and make sure they answered it. Sometimes they have only finished part of the problem, sometimes their answer makes no sense so they need to go back and see if they made the right decision as to what to do. It's very important that students see how and why to do this step. Have some examples ready to show students when this is important.

Example: How many oranges do you have if there are 6 boxes with 8 oranges each and 3 oranges left over outside the box.

If the student decides to multiply 6×8 they have made the right decision.

They get 48, but that is not the answer, they need to continue and add the extra 3 to answer the question. The answer is 51, not 48.

If the student multiplied 8×3 and got 24, they need to see that the answer is way too small and recheck what they decided to do and redo the problem.

More word problems are set up using this four-step process on the following worksheet. There is a second worksheet form that requires the student to copy the word problem onto the paper before working through the steps.

Student: _____

Date: _____

Teacher: _____

WORD PROBLEMS THE ZENGLER WAY

Problem #1

1. Read the problem: How many eggs will you need to buy to make 3 batches of brownies? Each batch requires 2 eggs and you have one egg in the refrigerator.
2. Decide what to do. Write your plan of action here. How will you solve this problem? What steps are involved?
3. Solve the problem. Show your math work here. Do each of the steps you described in section 2.
4. Answer the question. Re-read the problem and make sure you are answering the question asked. This will mean that you not only have the number right, but that you are giving the correct number for the correct item. (Must you answer about number of brownies, eggs or people to serve?)

Answer Key

WORD PROBLEMS THE ZENGLER WAY

Problem #1

1. Read the problem: How many eggs will you need to buy to make 3 batches of brownies? Each batch requires 2 eggs and you have one egg in the refrigerator.
2. Decide what to do. Write your plan of action here. How will you solve this problem? What steps are involved?

Multiply the amount of eggs for each batch by the number of batches to be prepared subtract the number of eggs you already have.

3. Solve the problem. Show your math work here. Do each of the steps you described in section 2.

$3 \times 2 = 6 - 1 = 5$ eggs needed

4. Answer the question. Re-read the problem and make sure you are answering the question asked. This will mean that you not only have the number right, but that you are giving the correct number for the correct item. (Must you answer about number of brownies, eggs or people to serve?)

The question asks for the number of eggs needed. The answer states the number of eggs needed.

Answer Key

Problem #2

1. Read the problem: How long will it take you to get from Ted's house to your house if you must travel 60 miles at 20 mph on your bike and you must make at least a 30 minute stop for rest and lunch.
2. Decide what to do. Write your plan here. How will you solve this problem? What steps are involved?

Divide 60 miles into 20 mile increments to determine how many total hours of travel.

Add 30 minutes to your travel time for lunch and rest.

3. Solve the problem. Show your math work here. Do each of the steps you described in section 2.

$$\begin{array}{r} 60 \div 20 = 3 \text{ hours} \\ + 30 \text{ minutes} \end{array}$$

3 hours & 30 minutes

4. Answer the question. Re-read the problem and make sure you are answering the question asked. This will mean that you not only have the number right, but that you are giving the correct number for the correct item.

The question asks how long the trip will take. 3 hours and 30 minutes answers the question.

Benchmark: 11.01, 11.02, 11.03, 11.04

Student: _____ Date: _____

Teacher: _____

WORD PROBLEMS THE ZENGLER WAY

1. Read the problem.
2. Decide what to do. Write your plan of action here. How will you solve this problem? What steps are involved?
3. Solve the problem. Show your math work here. Do each of the steps you described in section 2.
4. Answer the question. Re-read the problem and make sure you are answering the question asked. This will mean that you not only have the number right, but that you are giving the correct number for the correct item.

Benchmark: 11.02, 11.03, 11.04

- LEVEL:** 2.0 – 3.9
- STANDARD:** 11.0 Apply math skills in word problem applications
- BENCHMARK:** 11.02 Explain the reasoning steps in solving real-world problems by:
- determining the question
 - identifying the information given
 - deciding on the operation
 - working and checking
 - making certain the answer is logical
- 11.03 Recognize that all math has only four operations: addition, subtraction, multiplication and division.
- 11.04 Select the appropriate operation to solve specific problems involving addition, subtraction, multiplication and division.
- DESCRIPTION:** Teacher will hold up a card with a number on it and students will distribute their manipulatives to demonstrate different ways to write a number sentence.
- MATERIALS:** Containers of manipulatives, paper and number cards, hand held dry erase boards and markers
- PROCEDURE:** Divide students into four groups. Distribute a dry erase board, a marker and a container of manipulatives to each group. Assign an operation to each group (i.e.: addition, subtraction, multiplication, or division). The teacher will hold up a number card. Each group will show their answer with the manipulative according to the mathematical operation assigned. They will then write a number sentence on the dry erase board. Change the operation given to each group and repeat this activity until each group has had the chance to show a number using each operation.

LEVEL: 2.0 – 3.9

STANDARD: 11.0 Apply math skills in word problem applications

BENCHMARK: 11.03 Recognize that all math has only four operations: addition, subtraction, multiplication, and division.

11.04 Select the appropriate operation to solve specific problems involving addition, subtraction, multiplication, and division.

DESCRIPTION: The teacher will hold up a plus, minus, division or multiplication sign and then place the appropriate number of tiles on the overhead, using several different number sentences. For example, the teacher will hold up a plus sign and the students will place tiles or write on the transparency to represent an addition, subtraction, multiplication or division operation.

□□□□ ____ □□□□□□□□ = □□□□□□□□□□
or
4 ____ 8 = 12

MATERIALS: Transparencies, Overhead projector, Colored tiles or dry erase markers, colored pencils/pens, Cards with plus, minus, multiplication and division symbols provided

PROCEDURE:

Role of the Teacher:

- Teacher will hold up a card with a math operation (plus, minus, multiplication or division symbol)
- Using tiles or markers the teacher will demonstrate the operations on the overhead projector.
- Distribute tiles or markers to students.

Evaluation Teacher will observe the students as they work with the tiles or write their operation on the transparency. Discuss the operations with students.

Role of the Students:

- Students will manipulate the tiles or write on the transparencies on the overhead.
- Other students will manipulate tiles or write responses at their desks.

Variation:

- Have students write a number sentence or word problem to go along with the operation.

+

-

X

÷

LEVEL: 2.0 - 3.9

STANDARD: 12.0 Demonstrate estimation skills

BENCHMARK: 12.01 Round numbers to 10s and 100s.

MATERIALS: Notebook paper, number lines

PROCEDURE: A number line is helpful in getting students to understand estimation and rounding. Have students create their own number lines. It is important that the numbers on a number line are evenly spaced, so have students turn a piece of notebook paper sideways and use the lines as spacers.

Students can continue to add to their number lines as they progress in math, eventually showing relationships between fractions, whole numbers, and negative numbers. Creating and using a number line is a long-term skill for math learners. Students can use the number line to see whether the number is closer to 10 or 20, 300 or 400. The number line can be used only with whole numbers, or fractions and decimals can be added. Negative numbers may also be added as students' math skills progress.

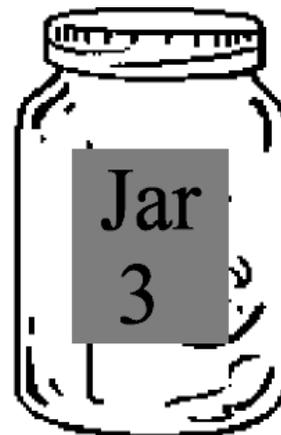
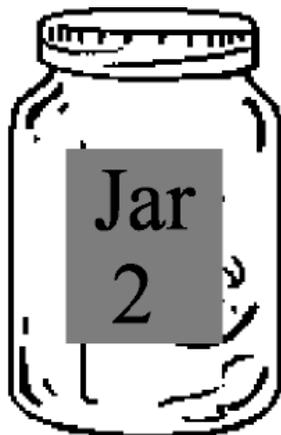
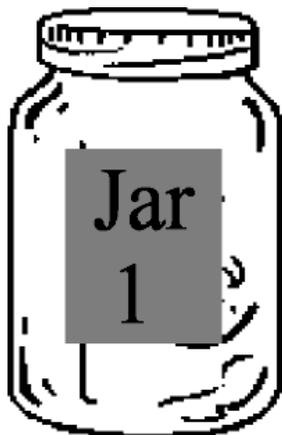
- LEVEL:** 2.0 - 3.9
- STANDARD:** 12.0 Demonstrate estimation skills
- BENCHMARK:** 12.02 Use rounding techniques to estimate the solution to a real-world addition or subtraction problem; then determine the actual result through computation.
- DESCRIPTION:** Students will be divided into two groups. One group will use estimation to make a pre-sweetened drink. The other group will use exact directions. Students will record information and discuss whether their estimation was appropriate or not.
- MATERIALS:** Pre-Sweetened powdered or syrup drink, plastic spoons, pitchers, water, paper cups, measuring scoops and/or cups, activity sheet
- PROCEDURE:**
- Role of the Teacher:***
- Discuss with students that estimation isn't bad, but it needs to be appropriate.
 - Question students throughout the activity about their reasoning.
 - Divide students into two groups. Explain the procedure for making the drink without giving specific directions (cover the directions on the container) to the group that will be estimating (group 1). Give exact directions to the group who will be mixing the drink following package directions (group 2).
 - Distribute Activity Sheets to students for recording information and results.
- Evaluation** Students will discuss their findings as recorded on activity sheets
- Role of the Students:***
- Group 1 will come to mixing area prepared for mixing the drink.
 - Students will discuss and come to an agreement on how much water and powdered mix will be used.
 - The rest of the class will record the amounts used.
 - All students will taste (if so desired) the estimated mixture and record results.
 - Group 2 will come to the mixing area and, guided by the teacher, mix the drink exactly according to package directions.
 - The rest of the class will record the amounts used.
 - All students will taste (if so desired) this mixture and record their findings on the activity sheet.
- Variation:***
- Some students may tally the number of scoops and cups of water used and draw a happy or sad face depending on the taste test.
 - Other students may write the exact number of scoops and cups of water used and write a sentence or story about the results.

	SCOOPS	WATER	
Group 1			 
Group 2			 
RESULTS			

- LEVEL:** 2.0 - 3.9
- STANDARD:** 12.0 Demonstrate estimation skills
- BENCHMARK:** 12.02 Use rounding techniques to estimate the solution to a real-world addition or subtraction problem; then determine the actual result through computation.
- DESCRIPTION:** Students will estimate which sets of objects in jars are more/less and describe why this is a reasonable assumption after counting a percentage in one jar.
- MATERIALS:** Three identical jars, three sets of different sized objects, black crayon or pencils, estimation jars activity sheet
- PROCEDURE:**
- Role of the Teacher:***
- Number jars 1, 2 and 3.
 - Fill jars with sets of different sized objects. For example, jar 1 could have M&M's, jar 2 could have marbles, and jar 3 could have colored tiles.
 - Tell students the amount of objects in jar 1.
 - After students have written down their estimations for the other 2 jars lead discussion about amounts in jars and sizes of the objects. Ask questions like, "What can you tell me about the size of the jars?" and "What can you tell me about the size of the objects?"
 - Stress reasonableness of estimates using large group discussion.
- Evaluation** Student participation in class discussion. Activity sheet.
- Role of the Students:***
- Estimate amounts in jars 2 and 3.
 - Record estimates with black crayon or pencil on activity sheet.
 - Discuss estimates and tell how answers were derived.
 - After counting objects in jars 2 and 3, compare amounts in jars by using the terms **most**, **least**, or **equal to**.
- Variation:***
- Vary sizes and amounts of objects
 - Give a range of numbers for estimation
 - Fill jars at different levels, such as, half full or almost full.

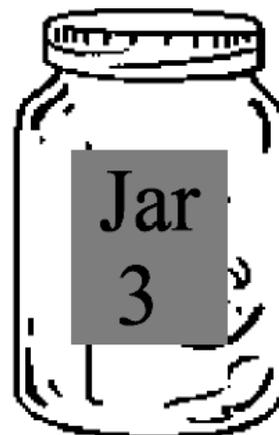
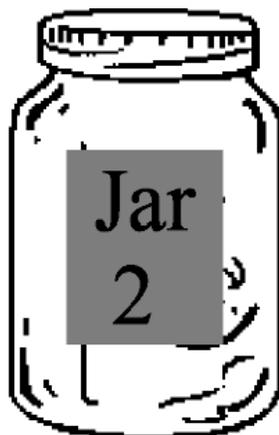
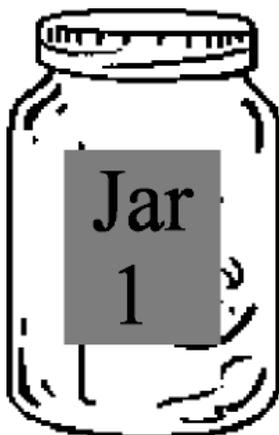
Estimation Jars Activity Sheet

Count the number of items in Jar 1 and write your answer on line 1.
Estimate the number of items in Jar 2 and in Jar 3 on the line beneath the jars.



Estimation Jars Activity Sheet

Count the number of items in Jar 1 and write your answer on line 1.
Estimate the number of items in Jar 2 and in Jar 3 on the line beneath the jars.



- LEVEL:** 2.0 - 3.9
- STANDARD:** 12.0 Demonstrate estimation skills
- BENCHMARK:** 12.02 Use rounding techniques to estimate the solution to a real-world addition or subtraction problem; then determine the actual result through computation.
- DESCRIPTION:** The teacher will read the scenarios provided and discuss the appropriateness and reasonableness of the students' answers.
- MATERIALS:** Short scenarios to be read. See Activity Sheet provided. Teacher may create additional scenarios.
- PROCEDURE:**
- Role of the Teacher:***
- Read scenarios.
 - Discuss appropriateness of estimation with students.
 - Discuss reasonableness of solutions with students.
- Evaluation:** Discuss reasonableness of responses with students.
- Role of the Students:***
- Read or listen to scenarios and record responses.

SCENARIOS FOR REASONABLE ESTIMATION

1. Our class is having a pizza party. Can your teacher use estimation to determine the number of pizzas to order?

2. The teacher wants each student to have one can of soda each. Can the teacher estimate the number of sodas or does he/she count the exact number required?

3. You want to buy groceries. Do you estimate the amount of money you need to bring to the store or do you need to know the exact amount?

LEVEL: 2.0-3.9

STANDARD: 12.0 Demonstrate estimation skills

BENCHMARK: 12.02 Use rounding techniques to estimate the solution to a real-world addition or subtraction problem; then determine the actual result through computation.

MATERIALS: Rounding worksheet

DIRECTIONS: Explain that numbers that end in zero are easier to work with. When we round off a number we are trying to find the number that ends in a zero that this number is closest to.

Suppose you and 4 friends are trying to determine if you have enough money to buy a gift for your teacher. One person had \$18, another had \$9, another had \$29, and you had \$19. It would be easiest to say the first person has about \$20, the next has about \$10, the other has about \$30 and you have about \$20. Adding $20 + 10 + 30 + 20$ is a lot easier and less time consuming than adding the actual numbers.

There are times when rounding works great, like with money, mileage, and averages. You wouldn't want to round when you are mixing chemicals, collecting money for a store, or writing a prescription for a patient.

When rounding to the nearest ten, hundred, thousand, etc. the rule of thumb is 5 or above round to the next highest number ending in zero. If the number ends in 4 or below, round to the lower number ending in zero. For example, 26 would be rounded to 30 but 24 would be rounded to 20.

Have the student come up with some instances when it would be helpful to round the numbers you are working with. Then have them complete the worksheet.

Student: _____

Date: _____

Teacher: _____

Rounding Worksheet

Practice rounding:

Round the following numbers to the nearest ten.

1. 38 = _____
2. 9 = _____
3. 52 = _____
4. 91 = _____
5. 17 = _____

Round the following numbers to the nearest hundred.

6. 203 = _____
7. 98 = _____
8. 125 = _____
9. 578 = _____
10. 230 = _____

Round the following numbers to the nearest thousand.

11. 1600 = _____
12. 5550 = _____
13. 1475 = _____
14. 4150 = _____
15. 9008 = _____

Solve these word problems by first rounding to get an estimated answer and then solving the actual problem.

16. How much did Sarah pay per tire if the cost was \$155 for all four tires?

17. Miss Jones is a math teacher. She has 5 classes each day. Her first class has 28 students, her second has 25 students, her third has 21 students, her fourth has 29 students and her last class has 22 students. How many students does she have in all?

18. Mr. Kennsington owns a hot dog stand. He starts each day with 250 hot dogs. From 9 AM to 12 noon, he sells 18 hot dogs, from 12 noon until 3 PM he sells 72 hot dogs, and from 3 pm until 6 PM he sells 45 hot dogs. How many hot dogs does he have left at the end of the day?

**ANSWER KEY:
FOR ROUNDING
WORKSHEET**

1. 40
2. 10
3. 50
4. 90
5. 20
6. 200
7. 100
8. 100
9. 600
10. 200
11. 2000
12. 6000
13. 1000
14. 4000
15. 9000
16. $\$160 / 4 = \40 , $\$155 / 4 = \38.75
17. $30 + 30 + 20 + 30 + 20 = 130$, $28 + 25 + 21 + 29 + 22 = 125$
18. $20 + 70 + 50 = 140$, $18 + 72 + 45 = 135$

- LEVEL:** 2.0-3.9
- STANDARD:** 13.0 Use units of measurement
- BENCHMARK:** 13.02 Identify common units of customary measurements for length, capacity, weight, and temperature.
- 13.03 Identify, select and use appropriate tools from the customary system for measuring length, capacity, weight and temperature.
- MATERIALS:** Measurement Scavenger Hunt worksheet.
- PROCEDURES:** Give students the worksheet and give them one week to find one thing that is measured in each unit. They may look at home or in a store, whatever is more convenient. Make sure they are aware that they must not only name the product but list its size and if it is liquid, powder or solid on the worksheet. After a week have the student compare each item and determine a common unit for different types of items. Then using the ads for grocery stores, have them make posters for different types of measures.
- VARIATION:** Bring in empty boxes with different units of measures, like cereal boxes, aluminum foil, string, milk cartons, etc. Have the students study the items and determine the common units

Student: _____

Date: _____

Teacher: _____

Measurement Scavenger Hunt

You must find an item that is measured in each unit of measurement listed below.
List by the brand, name, size, form (liquid, powder, solid, etc...)

UNIT OF MEASUREMENT	NAME OF ITEM	BRAND OF ITEM	SIZE OF ITEM	FORM OF ITEM
Ounce				
Pound				
Liter				
Gallon				
Cup				
Pint				
Foot				
Yard				
Hour				
Minute				
Year				
Teaspoon				
Tablespoon				

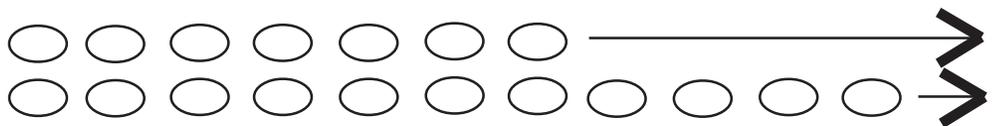
LEVEL:	2.0 - 3.9
STANDARD:	14.0 Recognize a wide variety of patterns, relations and functions
BENCHMARK:	14.01 Recognize symbols and concepts of equal (=) and unequal (\neq) and less than (<) and greater than (>).
DESCRIPTION:	Students will match groups of beans by using one to one correspondence to determine greater than, less than, and equal to.
MATERIALS:	Beans, marbles, pebbles (or another item that can be scooped) Scoops (one for each pair of students) Bowls (one per group) Activity sheet

PROCEDURE:

Role of the Teacher:

- Demonstrate the activity, pairing a student with the teacher. Fill the bowl with beans. The teacher and the student scoop beans from a bowl. Each counts their beans and does a one-to-one correspondence lining their beans next to each other. For example:

Teacher's Scoop of beans



Student's Scoop of beans

- Decide who has the most and who has the least. On the board write the activity sheet questions twice. One set of questions are the teachers and the other set is for the student. The teacher reads his/her sentences to the student, and the student reads their sentences to the teacher. Discuss how they got the answer to the last statement.
- Put students in groups of 2
- Give each pair of students a scoop, beans (or an item to scoop), and each an activity sheet.

Evaluation: Observe each group. Question orally. Check activity sheets.

Continued

Role of the Students:

- Each student will fill his/her scoop with beans from the bowl.
- Line beans on desk showing a one-to-one correspondence with their partners' beans.
- Decide who has the most and who has the least.
- Record answers on activity sheet.
- Each student reads his/her sentences to his/her partner.
- Tell how they got the answer to the last statement.

Variation:

- Use either smaller scoops or larger objects and evaluate by observation only.
- Use symbols $<$, $>$, or $=$.
- Use symbols to write number sentences. (Example: $13 > 10$)

Student: _____ Date: _____

Teacher: _____

Scoops Activity Sheet

Count the number of beans you have scooped from the bowl. Record your count and your partners' in the blanks below. Circle the answer to the last question in each number and write it on the blank. Each partner will read the sentences to the other.

1. I have _____ beans.

You have _____ beans.

My number of beans is _____ your number of beans.
(greater than, less than, equal to)

2. I have _____ beans.

You have _____ beans.

My number of beans is _____ your number of beans.
(greater than, less than, equal to)

3. I have _____ beans.

You have _____ beans.

My number of beans is _____ your number of beans.
(greater than, less than, equal to)

4. I have _____ beans.

You have _____ beans.

My number of beans is _____ your number of beans.
(greater than, less than, equal to)

5. I have _____ beans.

You have _____ beans.

My number of beans is _____ your number of beans.
(greater than, less than, equal to)

- LEVEL:** 2.0 - 3.9
- STANDARD:** 14.0 Recognize a wide variety of patterns, relations and functions
- BENCHMARK:** 14.01 Recognize symbols and concepts of equal (=) and unequal (\neq) and less than (<) and greater than (>).
- MATERIALS:** Pencil, paper, computer (optional)
- PROCEDURE:** Introduce the class to the symbols for equal, not equal, less than and greater than. Have the students work in groups to write 3 true statements with each symbol and 3 false statements with each symbol. Collect all the work and have one student type all the statements onto one worksheet. Print out a copy for each student and have each student decide which statements are true and which are false. Check the worksheets as a class, with different groups being the experts for different questions.

Benchmark: 14.01, 14.02, 14.03

LEVEL:	2.0 - 3.9
STANDARD:	14.0 Recognize a wide variety of patterns, relations and functions
BENCHMARK:	14.01 Recognize symbols and concepts of equal (=) and unequal (\neq), less than (<) and greater than (>) 14.02 Identify the next item of a pattern or a number sequence. 14.03 Identify the missing item of a pattern or a number sequence.
DESCRIPTION:	Students will assemble a hundred chart puzzle based on the patterns of the numbers.
MATERIALS:	One hundred chart puzzle for each student A large hundred chart puzzle that students can refer to as they assemble their puzzles. Different color highlighters, markers or pencils for identifying patterns and/or sequences
PROCEDURE:	<p><i>Role of the Teacher:</i></p> <ul style="list-style-type: none">• Create various patterns and sequences• Distribute the 100's chart and puzzles• Have students assemble puzzle and/or find the missing number of a sequence by coloring the sequence pattern on the 100's chart.• Observe students and ask them to verbalize how they knew where to put various pieces and/or solve the pattern or sequence. <p>Evaluation: Teacher observation: Students can tell what number comes before, after, above, or below another number on a hundreds chart. Students can use visual patterns as well as number patterns to assemble a puzzle or solve a sequence or pattern. Students can associate equal, unequal, less than, greater than, one less, ten more, and/or ten less, etc. to relative positions on the hundreds chart.</p> <p><i>Role of the Students:</i></p> <ul style="list-style-type: none">• Look for patterns• Verbalize thinking• Assemble or Color charts accordingly

Benchmark: 14.0

Student: _____

Date: _____

Teacher: _____

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

LEVEL: 2.0 - 3.9

STANDARD: 14.0 Recognize a wide variety of patterns, relations, and functions

BENCHMARK: 14.02 Identify the next item of a pattern or a number sequence.
14.03 Identify the missing item of a pattern or a number sequence.

MATERIALS: Patterns Worksheet

PROCEDURE: Benchmarks 14.02 and 14.03 can be worked on with the sample worksheet that follows or with the multiplication chart (Standard 10) or hundreds chart (Standard 8). The basic procedure is this: point out a pattern and ask students to find the next element in the pattern and explain why this is the next element. The explanation can be verbal or may be written in a math journal. Don't always create your pattern by starting at the beginning; go backwards; ask for numbers in the middle of a pattern instead of at the end.

Student: _____

Date: _____

Teacher: _____

Patterns

Examine the pattern created in the first box. Fill in the missing parts of the pattern in the second box. For five of these problems, include on the back or at the bottom of this sheet an explanation of how you know those are the missing parts of the pattern.

10, 12, 14, 18, 20, 22, ____, ____, ____	
28, ____, 14, ____, 0	
10, 30, 50, ____, ____, ____	
= + * * = + & & + = ____, ____ = + ____, ____	
NnnDLQQN __nD __Q __QNnnDL ____, ____, N	
77, 66, ____, ____, 33, ____, ____	
7, 11, 15, 19, ____, ____, ____	
60, 57, 54, 51, ____, ____, ____	
500, 700, 900, ____, ____, 1500, ____	
Ab, ac, ad, bb, ____, bd, cc, ____, ____	

Answer Key

Patterns

Examine the pattern created in the first box. Fill in the missing parts of the pattern in the second box. For five of these problems, include on the back or at the bottom of this sheet an explanation of how you know those are the missing parts of the pattern.

10,12,14,18,20,22, ____, ____, ____	add 2
28, ____, 14, ____, 0	subtract 7
10, 30, 50, ____, ____, ____	add 20
= + * * = + & & + = ____, ____ = + ____, ____	what comes next
NnnDLQQN __nD __Q __QNnnDL ____, ____, N	what comes next
77, 66, ____, ____, 33, ____, ____	subtract 11
7, 11, 15, 19, ____, ____, ____	add 4
60, 57, 54, 51, ____, ____, ____	subtract 3
500, 700, 900, ____, ____, 1500, ____	add 200
Ab, ac, ad, bb, ____, bd, cc, ____, ____	what comes next

- LEVEL:** 2.0 – 3.9
- STANDARD:** 15.0 Describe and identify 3-dimensional shapes
- BENCHMARK:** 15.01 Identify and describe the characteristics of basic three-dimensional shapes.
- DESCRIPTION:** Students will find examples that illustrate geometric objects from magazines and newspapers.
- MATERIALS:** Magazines, Poster boards, Scissors, Glue sticks
- PROCEDURE:**
- Role of the Teacher:***
- Introduce geometric shapes (a rectangle, triangle, pentagon, hexagon, square, sphere, cone, and cylinder).
 - Facilitate student activities
 - Tour the classroom and school pointing out various shapes
 - Ask students to describe geometric shapes they see at home and in the community
 - Teacher will divide class into small groups and distribute magazines, scissors, poster board and glue sticks to groups.
 - Teacher will instruct students to cut pictures from the magazines that illustrate the shapes on the poster board.
- Evaluation:** Students will be able to identify the geometric shapes
- Role of the Students:***
- Identify and name the appropriate shape
 - Make a poster of different shapes
 - Explore his/her environment for examples of geometric shapes
 - Describe findings
- Variation:***
- More complex shapes can be used

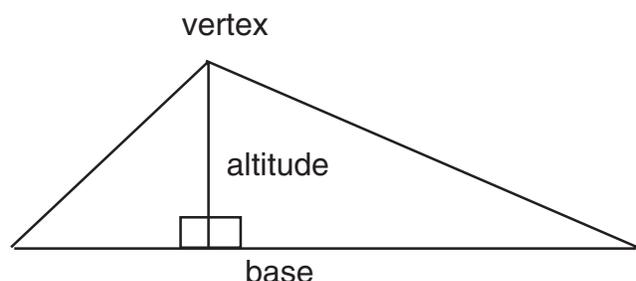
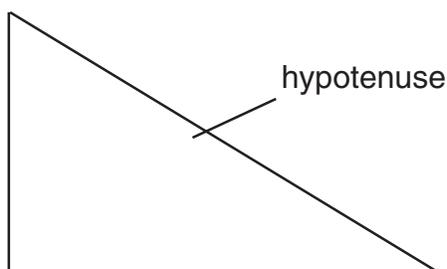
LEVEL:	2.0 – 3.9
STANDARD:	15.0 Describe and identify 3-dimensional shapes
BENCHMARK:	15.01 Identify and describe the characteristics of basic 3-dimensional shapes.
DESCRIPTION:	Students will explore and sort geometric solids.
MATERIALS:	<p>For each group of 4 students provide a set of solid figures including a rectangle, a triangle, a hexagon, a square, a sphere, a cone, and a cylinder.</p> <p>An overhead projector with the platform hidden so that the students cannot see what is on it</p>
PROCEDURE:	<p><i>Role of the Teacher:</i></p> <ul style="list-style-type: none">• Introduce geometric shapes (a rectangle, triangle, pentagon, hexagon, square, sphere, cone, and cylinder).• Divide the students into groups of 4• Facilitate group activities• Help students develop appropriate vocabulary• Give each group a set of solid figures. Let students explore them. Ask students to draw or trace the shapes onto their paper.• Ask the students to describe the attributes of each shape.• Line up a set of the shapes that all the students can see in front of an overhead projector. Block the view of the projector platform from the students so that they cannot see the object drawn on the transparency. Show the students the transparency and let them guess which object this shape represents.• Pair the students. One student should stand behind another student and place one of the objects in his/her hands behind his/her back; the student should feel the object, describe it and identify which one he or she has. <p>Evaluation: Students can identify the object</p> <p><i>Role of the Students:</i></p> <ul style="list-style-type: none">• Choose the appropriate object• Make a presentation

- LEVEL:** 2.0 - 3.9, 4.0-5.9
- STANDARD:** 15.0 Describe and identify 3-dimensional shapes
- BENCHMARK:** 15.01 Identify and describe the characteristics of basic 3-dimensional shapes.
- MATERIALS:** One square sheet of paper big enough to tear, approximately 8" X 8"
Tangram Tangle Handout
- PROCEDURE:** Reproduce handout and give to each student or group. Vocabulary defined on the following pages are presented in all capitals. You might advise students that paper tears more easily after it is creased and dampened with a quick lick. Of course, scissors could be provided for Cutting Tangrams if you prefer. After the tangrams are torn or cut, students should reassemble the tangrams into a square. A solution key is provided.

TEARING TANGRAMS – VOCABULARY

- Square-** A rectangle having two adjacent sides of equal length. It can be shown that all four sides have the same length.
- Hypotenuse-** The longest side of a plane right triangle; the side of a plane right angle triangle opposite the right angle.
- Trapezoid-** A quadrilateral with two, and only two, opposite sides parallel.
- Diagonal-** A line segment connecting two non-adjacent vertices of a polygon.
- Altitude-** A line segment whose one endpoint is the vertex of a polygon and whose other endpoint intersects the side opposite the vertex, called the base. The altitude is perpendicular to the base.
- Triangle-** A closed plane figure with three sides. Triangles are classified by the relationship of the sides (e.g. isosceles) or by the measure of the angles (e.g. acute).
- Isosceles Triangle-** A triangle in which two sides have the same measure.
- Right triangle-** A triangle, one of whose angles is a right angle.
- Right angle-** An angle of 90 degrees
- Vertex of a polygon-** The point of intersection of any two adjacent sides of the polygon.
- Acute angle-** Any angle whose measure is greater than 0 degrees but less than 90 degrees.
- Base of a geometric figure-** In a triangle, the side opposite the vertex angle is called the base of the triangle. Many geometric figures have sides or portions of planes as their bases.

*Bendick, Jeanne and Levin, Marcia. Mathematics Illustrated Dictionary. McGraw Hill, 1965



Student: _____

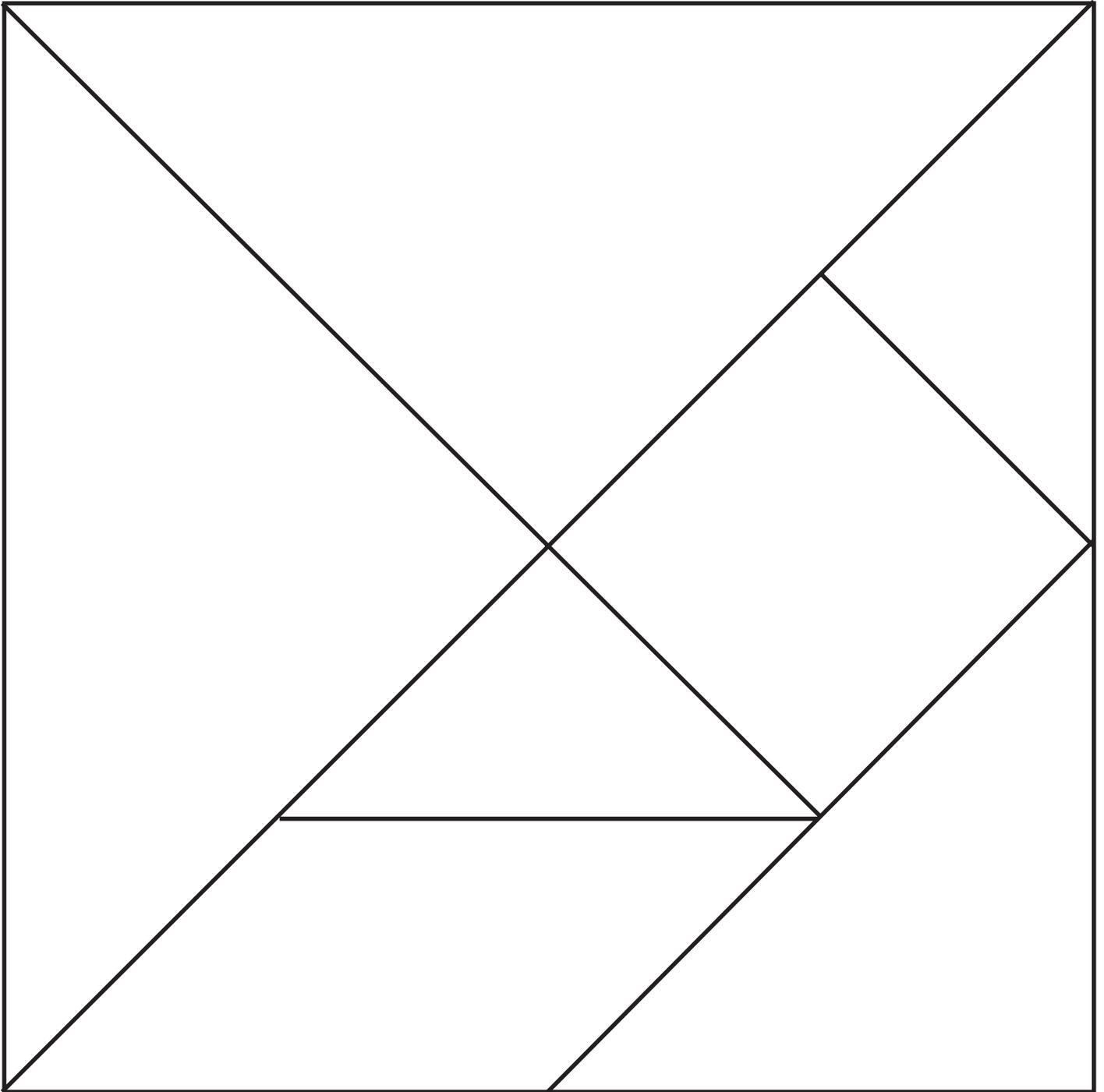
Date: _____

Teacher: _____

TEARING TANGRAMS

1. Start with a SQUARE. Fold it along the DIAGONAL.
Crease and tear.
2. Take 1 of the ISOSCELES RIGHT TRIANGLES and position it so its HYPOTENUSE is its base. Fold it in half and tear along the ALTITUDE.
3. Take the large TRIANGLE. Find the midpoint of the hypotenuse and pinch. Fold the RIGHT ANGLE VERTEX down to touch the midpoint. Tear along the crease.
4. Fold the TRAPEZOID in half. Crease and tear.
5. Take 1 of the right trapezoids and place it so its longest side is at the base. Touch the right angle to the ACUTE ANGLE.
Crease and tear.
6. Reassemble the SQUARE!

Answer Key: Reassembling the Square



Student: _____ Date: _____

Teacher: _____

TANGRAM TANGLE

# OF PIECES	SQUARE	TRIANGLE	RECTANGLE	TRAPEZOID
3 SMALLER TRIANGLES				
5 SMALLEST PIECES				
ALL 7 PIECES				

For an extra challenge, look up “rhombus” and make one with the 3 smaller triangles, the 5 smallest pieces, and all 7 pieces.

- LEVEL:** 2.0 – 3.9
- STANDARD:** 16.0 Solve money problems
- BENCHMARK:** 16.01 Count coins and currency.
- MATERIALS:** Counting Money handout
- PROCEDURE:** Teacher should start out with some examples that are low level and then work up to more complicated examples.

Examples: Have students add the amount of the coins listed:

1 quarter, 3 dimes, 2 nickels, 4 pennies = \$0.69

$$\$0.25 + \$0.30 + \$0.10 + \$0.04 = \$0.69$$

2 quarters, 1 dime, 5 nickels, 3 pennies = \$0.88

$$\$0.50 + \$0.10 + \$0.25 + \$0.03 = \$0.88$$

Now add some currency:

2 one-dollar bills, 3 quarters, 1 dime, 3 nickels, 1 penny

$$\$2.00 + \$0.75 + \$0.10 + \$0.15 + \$0.01 = \$3.01$$

3 five-dollar bills, 2 one-dollar bills, 2 quarters, 3 nickels, 8 pennies

$$\$15.00 + \$2.00 + \$0.50 + \$0.15 + \$0.08 = \$17.73$$

When you feel the students are ready, give them the handout and have them work alone or in pairs. When finished put the solutions on the board for students to check or discuss the solutions with them if time permits.

- VARIATION:** Use play money if it is available to create a hands-on activity. Give students a box of assorted money and have them pick out what is needed for the problem and then add its value.

- ANSWER KEY:**
1. \$1.15
 2. \$1.73
 3. \$2.77
 4. \$5.86
 5. \$23.89
 6. \$25.49
 7. \$75.35
 8. \$31.34
 9. \$101.28
 10. \$164.06

Student: _____ Date: _____

Teacher: _____

Counting Money!

Count the following combinations of coins and currency.

1. 2 quarters, 3 dimes, 6 nickels, 5 pennies 1. _____
2. 4 quarters, 6 dimes, 2 nickels, 3 pennies 2. _____
3. 1 one-dollar bill, 5 quarters, 4 dimes 12 pennies 3. _____
4. 5 one-dollar bills, 1 quarter, 4 dimes, 3 nickels, 6 pennies 4. _____
5. 4 five-dollar bills, 3 one-dollar bills, 5 dimes, 3 nickels, 24 pennies 5. _____
6. 2 five-dollar bills, 15 one-dollar bills, 1 dimes, 7 nickels, 4 pennies 6. _____
7. 6 ten-dollar bills, 2 five-dollar bills, 3 one-dollar bills, 5 quarters, 11 dimes 7. _____
8. 1 twenty-dollar bill, 2 five-dollar bills, 3 quarters, 5 dimes, 9 pennies 8. _____
9. 6 ten-dollar bills, 5 five-dollar bills, 15 one-dollar bills, 5 quarters,
3 pennies 9. _____
10. 3 twenty-dollar bills, 8 ten-dollar bills, 3 five-dollar bills, 7 one-dollar
bills, 3 quarters, 8 dimes, 7 nickels, 16 pennies 10. _____

LEVEL: 2.0 – 3.9

STANDARD: 16.0 Solve money problems

BENCHMARK: 16.02 Determine equivalent amounts of up to five dollars using coins and paper currency.

MATERIALS: Play money (store bought or home made- you can scan some money with a piece of colored tape across the bill then copy it and cut it out) put in bags in the following denominations: 1 five-dollar bill, 5 one-dollar bills, 4 quarters, 5 dimes, 5 nickels, 5 pennies.

PROCEDURE: Put students in-groups of 2 to 5. Pass out a moneybag to each group. Write \$1.00 on the board. Have students, working in-groups, and come up with as many combinations of coins and currency they can that is equivalent to \$1.00 and record these combinations.

Now increase the amount up to different amount until you get to \$5.00. Make sure you have worked out the solutions for the amounts you give ahead of time or you can use mine listed below.

\$1.00: 1 dollar bill

4 quarters

3Q, 2D, 1N

3Q, 2D, 5 P

3Q, 1D, 3 N

3Q, 1D, 2N 5P

3Q, 5 N

3Q, 4N, 5 P

2Q, 5D

2Q, 4D, 2N

2Q, 4D, 1N, 5P

2Q, 3D, 4N

2Q, 3D, 3N, 5P

1Q, 5D, 5N

1Q, 5D, 4N, 5P

\$1.50: 1\$, 2Q
1\$, 1Q, 2D, 1N
1\$, 1Q, 2D, 5P
1\$, 1Q, 1D, 3N
1\$, 1Q, 1D, 2N, 5P
1\$, 5D
1\$, 4D, 2N
1\$, 4D, 1N, 5P
1\$, 3D, 4N
1\$, 3D, 3N, 5P
1\$, 2D, 5N, 5P
4Q, 5D
4Q, 4D, 2N
4Q, 4D, 1N, 5P
4Q, 3D, 4N
4Q, 3D, 3N, 5P
4Q, 3D, 5N, 5P

\$3.50 3\$, 2Q
3\$, 1Q, 2D, 1N
3\$, 1Q, 2D, 5P
3\$, 1Q, 1D, 3N
3\$, 1Q, 1D, 2N, 5P
3\$, 1Q, 5N
3\$, 1Q, 4N, 5P
2\$, 4Q, 5D
2\$, 4Q, 4D, 2N
2\$, 4Q, 4D, 1N, 5P
2\$, 3Q, 5D, 5N
2\$, 3Q, 5D, 4N, 5P

VARIATIONS: Try odd amounts like \$2.10, \$3.09, ...
Increase the amount of money in the bags
Ask students to write about patterns they begin to see as they work

- LEVEL:** 2.0 – 3.9
- STANDARD:** 16.0 Solve money problems
- BENCHMARK:** 16.03 Determine change from a one-dollar bill.
- MATERIALS:** Changing Dollars Handout
- PROCEDURE:** Give the student one example of what you expect them to do on the handout.

Example. $\$1 - 65 \text{ cents} = 35 \text{ cents}$, now give 3 examples of coins you can use to make this change:

1Q, 1D
1Q, 1N, 5P
3D, 1N

Student: _____

Date: _____

Teacher: _____

Changing Dollars

1. Find the amount of change that you would give back to the customer for an item costing the given amount. The customer pays with a one dollar bill.
2. Give 3 examples of how you can count that out in coins.

1. 75 cents

2. 55 cents

3. 63 cents

4. 67 cents

5. 93 cents

6. 23 cents

7. 47 cents

8. 83 cents

9. 12 cents

10. 79 cents

11. 59 cents

12. 34 cents

13. 17 cents

14. 49 cents

15. 62 cents

LEVEL: 2.0 – 3.9

STANDARD: 16.0 Solve money problems

BENCHMARK: 16.04 Determine equivalent amounts of up to ten dollars using coins and paper currency.

MATERIALS: Play money (store bought or home made- you can scan some money then copy it and cut it out) put in bags in the following denominations: 1 twenty-dollar bill, 1 ten-dollar bill, 1 five-dollar bill, 5 one-dollar bills, 4 quarters, 5 dimes, 5 nickels, 5 pennies.

PROCEDURE: This activity is the same as the activity for 16.02 but with more money added to the moneybags.

Put students in-groups of 2 to 5. Pass out a moneybag to each group. Write \$6.00 on the board. Have students, working in-groups, and come up with as many combinations of coins and currency they can that is equivalent to \$6.00 and record these combinations.

Now increase the amount up to different amount until you get to \$20.00. Make sure you have worked out the solutions for the amounts you give ahead of time.

LEVEL: 2.0 – 3.9

STANDARD: 16.0 Solve money problems

BENCHMARK: 16.05 Solve real-world problems involving change after purchases with a ten-dollar bill.

16.06 Solve real-world problems involving comparison shopping for purchases of less than ten dollars.

MATERIALS: Sales flyers from the newspaper.

PROCEDURES: Have students choose products that cost under \$10/\$20. Have them list and total the cost. Then have them figure and add 7% sales tax to come up with a final amount due. Then have them trade with another student and make change for the other student's amount due. Have them continue trading until they have all completed at least 5 transactions. You can then start all over and have them choose another ad to work with.

VARIATIONS: You can bring empty food boxes or have students bring some in. Price them and have a little store. You can also take a trip to a grocery store.