

**ACCRS: 1.1**

Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (See Appendix A, Table 1.)

**Mastered:**

Students can use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

**Present:**

Students will create a visual representation of strategies used to add and subtract.

**Going Forward:**

Students will create stories to match the visual representations they created that illustrate adding and subtracting strategies.

**Present and Going Forward Vocabulary:**

Representation, strategy, guidebook

**Career Connections:**

Artist, Mathematician, Graphic Designer

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**Addition and Subtraction Art**

*Student Instruction:* Create a visual art exhibit that represents the strategies we use to find solutions to number sentences. Make sure to represent the following strategies in your art:

1. Adding to
2. Taking from
3. Putting together
4. Taking apart

Develop a guidebook for the exhibit in which there is a story problem written to match each piece of art. Visitors will work the story problems to identify the strategy used.

Materials needed:

- Paper or canvas
- Art media such as crayons, paints, markers, etc.

**OR:**

*Student Instructions:* Create a foldable or a collage of people using the following strategies:

1. Adding to
2. Taking from
3. Putting together
4. Taking apart

*Example:* Adding to might be a picture of someone adding milk to cereal or someone adding ketchup to their fries.

Taking from could be eating a slice of pizza from a pie, removing a book from a shelf, or taking candy from a container.

Using images from your collage, create story problems to go with the pictures and answer the questions.

*Questions:* What would the number sentences look like? What was being “added to” in the picture? What was “taken from” in the problem?

**Literature Connections/Resources:**

- Hague, Kathleen. Ten Little Bears. NY: Morrow Junior Books. 1999.
- Johnston, Diane H. How many Feet in the Bed? NY: Aladdin. 1991.
- Tang, Greg. The Grapes of Math. NY: Scholastic, Inc. 2001.
- Tang, Greg. Math Appeal. NY: Scholastic, Inc. 2003.
- Tang, Greg. Math Fables. NY: Scholastic, Inc. 2004.
- Tang, Greg. Math for All Seasons. NY: Scholastic, Inc. 2002.
- Tang, Greg. Mathterpieces. NY: Scholastic, Inc. 2003.
- Zike, Dina. Big Book of Books and Activities. San Antonio, TX: Dinah Might Adventures, LP. 1992.
- Zike, Dina. Foldables for Grades 1-6. Columbus, OH: McGraw-Hill. 2000.

**ACCRS: 1.2**

Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

**Mastered:**

Students can solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20 by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

**Present:**

Students will use equations with more than two addends in everyday applications.

**Going Forward:**

Students will analyze the equations used in everyday tasks and record them for continued use in activities.

**Present and Going Forward Vocabulary:**

Addend

**Career Connections:**

Artist, Writer, Game Creator, Builder

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**I Can with Three or More Addends**

*Student Instructions:* Choose one or more activities to complete. Place a check mark next to the activity or activities you choose. Research your topic in order to develop the products. You may want to plan your project using the Project Planner.

1. Create a story that involves at least three number sentences with more than 2 addends. Illustrate the story and write the equation that matches.
2. Read a nursery rhyme or fairy tale. Summarize the story using number sentences.

*Example:* The Story of the Three Little Pigs

$$1 \text{ little pig} + 1 \text{ little pig} + 1 \text{ little pig} = 3 \text{ little pigs.}$$

$$3 \text{ little pigs} + 1 \text{ wicked wolf} = \text{Trouble.}$$

$$(1 \text{ huff} + 1 \text{ puff}) \times 2 = 2 \text{ homeless pigs}$$

$$3 \text{ clever little pigs} - 1 \text{ wicked wolf} = 3 \text{ happy little pigs}$$

Fairy tales from which you might choose are *Three Little Kittens Who Lost Their Mittens*, *Goldilocks and the Three Bears*, *Hansel & Gretel*, *Jack and the Beanstalk*, or another of your choice.

3. Create a board game that requires the participants to add three numbers before moving on. Use cards or number cubes for generating numbers to add. Have each participant write the equation answered before moving on.

4. Create a display of blocks illustrating an equation with more than two addends. Write an equation to match.
5. Using digit cards, turn over three cards and record the number sentence that goes with the three digits along with the answer. Draw a rectangle around the number sentences whose sums are greater than 10. Draw an oval around number sentences whose sums are less than 10.

*Example:* If you turn over 3, 5, & 9, write the number sentence  $9+5+3=17$ . If the sum is greater than ten, draw a rectangle around it like this.  $9+5+3=17$

If you turn over 2, 2, & 5, write the number sentence,  $2+2+5=9$   
 If the sum is less than ten, draw an oval around it like this.  $2+2+5=9$

At the end of five rounds, determine if you have more circles or rectangles and write about the data collected. Don't forget to write the number sentences with neither a circle nor square around them!

*Example:*

1.	$3+5+9=17$
2.	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;"><math>2+2+5=9</math></span>
3.	<span style="border: 1px solid black; padding: 2px;"><math>5+2+6=13</math></span>
4.	<span style="border: 1px solid black; padding: 2px;"><math>3+2+8=13</math></span>
5.	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;"><math>2+1+5=8</math></span>

Most rounds had sums more than 10.  
 Two rounds had sums that were less than ten.

**Literature Connections/Resources:**

- Murphy, Stuart. *A Fair Bear Share*. NY: Scholastic, Inc. 1998.
- Tang, Greg. *Math-terpieces*. NY: Scholastic, Inc. 2003.
- Tang, Greg. *Math for All Seasons*. NY: Scholastic, Inc. 2005.

**ACCRS: 1.3**

Apply properties of operations as strategies to add and subtract. (Students need not use formal terms for these properties.)

Examples: If  $8 + 3 = 11$  is known, then  $3 + 8 = 11$  is also known (Commutative property of addition). To add  $2 + 6 + 4$ , the second two numbers can be added to make a ten, so  $2 + 6 + 4 = 2 + 10 = 12$  (Associative property of addition).

**Mastered:**

Students can apply properties of operations as strategies to add and subtract.

**Present:**

Students will create an exhibit to illustrate the Commutative and Associative properties of addition.

**Going Forward:**

Students will identify the Commutative and Associative properties in the exhibit guidebook and explain how it is used in addition.

**Present and Going Forward Vocabulary:**

Commutative property, Associative property, exhibit, visual, structural, literary

**Career Connections:**

Exhibitor, Artist, Event Planner

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**Rules of Addition Exhibition**

*Student Instructions:*

1. Create an exhibit that shows the Commutative property ( $8 + 3 = 11$ , then  $3 + 8 = 11$ ) and another that shows the Associative property (To add three numbers, two can be added and then the third. Example:  $2 + 6 + 4$  can be  $6 + 4 = 10$  and  $10 + 2 = 12$ ).
2. The exhibits can be drawn (visual art), built with blocks or manipulatives (structural art), or acted out through interpretive dance or movement, skits, mime, etc. (creative movement) or told in stories (literary art).
3. Make a guidebook for the exhibit that explains what the Commutative and Associative properties are and how they are used in addition.

**Materials needed:** (optional depending on child’s choice)

- Art supplies
- Blocks, dominoes, tens and ones blocks, counters, or other manipulatives
- Paper bags, string, yarn, material scraps, and other materials needed to make “props” or costumes for dance and other creative movement

**Literature Connections/Resources:**

- Murphy, Stuart. Ready, Set, Hop. NY: Scholastic, Inc. 1997.
- Tang, Greg. Math-terpieces. NY: Scholastic, Inc. 2003.
- NCTM Illuminations-Grouping and Grazing: <http://illuminations.nctm.org/ActivityDetail.aspx?ID=218>

**ACCRS: 1.4**

Understand subtraction as an unknown-addend problem.

*Example:* Subtract  $10 - 8$  by finding the number that makes 10 when added to 8.

**Mastered:**

Students can understand subtraction as an unknown-addend problem.

**Present:**

Students will apply the understanding of subtraction as an unknown-addend problem.

**Going Forward:**

Students will replace the unknown-addend with a variable in a number sentence.

**Present and Going Forward Vocabulary:**

Variable

**Career Connections:**

Carpenter, Builder, Wood Crafter

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**Cutting Wood**

*Student Instructions:* Read the following scenario and solve the problem.

**SCENARIO:** A carpenter went to the store to buy some wood for a project. He needed the following pieces:

- 5 sections of wood 25 inches long
- 2 sections of wood 56 inches long

The problem at the store was that the wood was in planks 60 inches long.

How many planks would he have to buy?

Show how each plank would be cut to get the sections he needed.

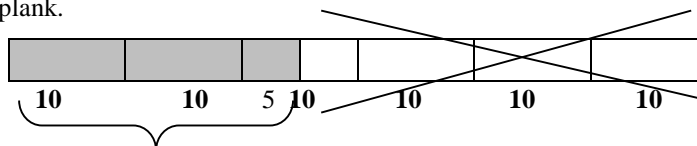
Use an X to show the part he did not need on each plank.

Write a number sentence to match each plank.

Find the value for X on each plank.

*Example:*

Plank #1



25in. Number Sentence:  $25 + X = 60$

X = ?

*You will need to repeat this process for each section to solve the problem.*

After you have a solution, answer the following questions:

1. What could happen if the wood was cut too short or too long?
2. Do you have enough wood left over to cut another 25 inch long section? Another 56 inch section?

**Materials needed:**

- Drawing materials
- Regular or graphing paper

**Literature Connections/Resources:**

NCTM Illuminations-“How Many Under the Shell?”: <http://illuminations.nctm.org/activitydetail.aspx?ID=198>

**ACCRS: 1.5**  
 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

<p><b>Mastered:</b>                  Students can relate counting to addition and subtraction.</p>	<p><b>Present:</b>                  Students will apply the counting strategy to movement up and down the number line, charting the beginning, ending, and change of position.</p>	<p><b>Going Forward:</b>                  Students will write a story to go with their records of floor changes in the “Elevator Game.”</p>
--------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------

**Present and Going Forward Vocabulary:**  
 Net change

**Career Connections:**  
 Hotel Management, Business, Properties Management

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**Riding the Elevator Game**

*Student Instructions:*

Draw a tall building with 10 floors. On each floor sketch what might be found there (examples: furniture store, food store, swimming pool, library, art museum, exercise rooms, clothing stores, etc.). On each floor, draw a box with the number of the floor.

Rules of the game:

1. Hang your drawing on the wall.
2. Place a clothespin at the entrance of your tall building on the ground floor (0).
3. Get a dot or number cube and make 5 cards with a plus (+) sign and 5 with a minus (-) sign. (You may draw your pluses and minuses on index cards or cut paper.)
4. Roll the die and draw a card from the stack to show where to move on the elevator. A minus on one cube tells you to take the elevator down, and a plus tells you to take the elevator up. The number cube tells you how many floors to go up or down.
5. The clothespin will “ride” the elevator up and down during the game. Move it up and down inside the elevator after each roll of the dice. **\*If you roll a number that takes you beyond the 10<sup>th</sup> floor or below the ground floor, roll again.**
6. Using the table provided, keep a record of where the elevator stops after each roll of the dice and how many floors you went up or down before it stopped.

Example: Your first roll is a 4 and you draw a plus card. Your second roll is a 2, and you draw a minus card.

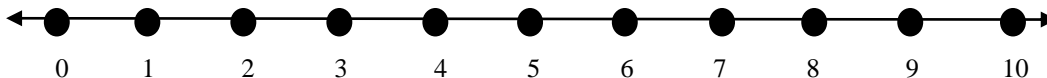
	Starting Floor	Ending Floor	Net Change
Roll 1	Ground (0)	4	+4
Roll 2	4	2	-2

**\*Remember that the starting floor on each roll will be the same as the ending floor on the previous roll.**

7. Roll the die and draw plus and minus cards from your deck until you have changed floors 10 times. On what floor did you stop?

★ If you have time, use your record page to write a story about your adventures in the building while riding the elevator.

Number Line:



- At the end of the game, on what floor did you stop? \_\_\_\_\_
- What was your total net change in floors after 10 rolls of the dice? \_\_\_\_\_
- Why do you suppose hotels do not use 0 to represent the bottom floor?
- What are some of the names that hotels or other buildings might use for the floors beneath the first floor?

**Materials needed:**

- Dot or number cube.
- Blank cube on which on which to write plus and minus signs or index cards or paper for students to make a set of 10 plus and minus cards.
- Clothespin or paper clip.
- Drawing paper.
- Tape or thumb tacks.

Adapted from NCTM Illuminations: Using an Elevator to Elevate Singed Number Expressions:

<http://illuminations.nctm.org/LessonDetail.aspx?ID=L733>

**Literature Connections/Resources:**

- Murphy, Stuart. Elevator Magic. NY: Scholastic, Inc. 1997.
- National Library of Virtual Manipulatives-Number Line Arithmetic:  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_197\\_g\\_2\\_t\\_1.html](http://nlvm.usu.edu/en/nav/frames_asid_197_g_2_t_1.html)

**ACCRS: 1.6**

Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g.,  $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$ ); decomposing a number leading to a ten (e.g.,  $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$ ); using the relationship between addition and subtraction (e.g., knowing that  $8 + 4 = 12$ , one knows  $12 - 8 = 4$ ); and creating equivalent but easier or known sums (e.g., adding  $6 + 7$  by creating the known equivalent  $6 + 6 + 1 = 12 + 1 = 13$ ).

**Mastered:**

Students can add and subtract within 20, demonstrating fluency for addition and subtraction within 10. They can use strategies such as counting, on; making ten; decomposing a number leading to a ten; using the relationship between addition and subtraction; and created equivalent but easier of known sums.

**Present:**

Students will survey classmates to find the most used strategies for adding and subtracting.

**Going Forward:**

Students will conduct a survey on a subject of their choosing, tally the data, and create appropriate graphs on their own.

**Present and Going Forward Vocabulary:**

Representations, strategies, guidebook

**Career Connections:**

Mathematician, Statistician, Teacher, Accountant

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**I Can...**

*Student Instructions:* Choose one or more activities to complete. Research your topic in order to develop the products. You may want to plan your project using the Project Planner.

1. Survey the class to see which of the following strategies are the class favorites when adding and subtracting: counting on; making ten; decomposing a number leading to a ten; using the relationship between addition and subtraction; and creating equal but easier sums. Show the results of the survey.
2. Make an Important Book about the ways students solve adding and subtracting sentences.
3. Create a board game using number sentences at least to 20. Participants move on the game board by solving addition and subtraction problems with a missing part.
4. Create an addition and subtraction guidebook showing different strategies for solving addition and subtraction sentences.

**Materials needed:** Art material

**Literature Connections/Resources:**

- Brown, Margaret. The Important Book. NY: Harper Collins. 1990.
- Tang, Greg. The Grapes of Math. NY: Scholastic, Inc. 2001.
- Tang, Greg. Math Appeal. NY: Scholastic, Inc. 2003.
- Tang, Greg. Math Fables. NY: Scholastic, Inc. 2004.
- Tang, Greg. Math for All Seasons. NY: Scholastic, Inc. 2002.

**ACCRS: 1.7**

Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.

**Mastered:**

Students can understand the meaning of the equal sign, and can determine if equations involving addition and subtraction are true or false.

**Present:**

Students will find and record different ways to combine numbers to make a specific number.

**Going Forward:**

Students will pair the different combinations for a number with the number sentences that match.

**Present and Going Forward Vocabulary:**  
Equation

**Career Connections:**

Teacher, Mathematician, Statistician, Accountant

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**Number Sorts**

*Student Instructions:* Make a set of number cards by numbering half sheets of paper from 1-12. Then color a strip of paper with one half red and the other half blue, or lay a piece of red construction paper next to a piece of blue paper. Choose a number from your stack of number cards and place it in the middle of the colored paper strip. How many different number combinations can you make by arranging the counters with some on the red side and some on the blue side? Record your arrangements of red and blue counters using number sentences. Continue until you have all combinations for 7. Make a “7” display by writing the different number sentences possible from the chart on a separate sheet of paper. Repeat with different numbers.

Example:

Red	Blue	Number Sentence
7		
● ● ●	● ● ● ●	$3 + 4 = 7$
● ● ● ● ●	● ●	$5 + 2 = 7$
	● ● ● ● ● ● ●	$0 + 7 = 7$

**Thought Questions:**

1. Do the blue and red sides have any of the same combinations?
2. What do you notice about the number combinations on each side (the red and the blue)?

**Materials needed:**

- Red and blue pencils or crayons.
- Counters.
- Student-made number cards, one on each “card,” from 2-12.
- Red and blue construction paper (optional).

**Literature Connections/Resources:**

- Murphy, Stuart. Mall Mania. NY: Scholastic, Inc. 2001.
- Murphy, Stuart. Elevator Magic. NY: Scholastic, Inc. 1997.
- Illuminations-How Many Under the Shell?: <http://illuminations.nctm.org/activitydetail.aspx?ID=198>

**ACCRS: 1.8**

Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.

Example: Determine the unknown number that makes the equation true in each of the equations,  $8 + ? = 11$ ,  $5 = ? - 3$ , and  $6 + 6 = ?$ .

**Mastered:**

Students can determine the unknown whole number in an addition or subtraction equation relating three whole numbers.

**Present:**

Students will create their own equations with unknown numbers.

**Going Forward:**

Students will make connections to real life by writing a number story to match each missing number equation.

**Present and Going Forward Vocabulary:**  
Equation**Career Connections:**

Author, Artist, Teacher, Mystery Writer

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**Missing Number Mysteries**

*Student Instructions:* Draw two number cards and use them in writing a number sentence to match. Put the equation on the back of an index card. On the front, write the equation again, but leave out one of the numbers. Write a “missing number mystery” or a math story to go with the new number sentence and missing number. Share your favorite stories with classmates and see if they can find the missing number. The index cards can be bound together to make a mini missing numbers booklet.

**Materials needed:**

1. Index cards
2. Number “cards” from 1-20 (can be student made from pieces of paper one number per piece of paper or card)

**Literature Connections/Resources:**

- Pulver, Robin. Punctuation Takes a Vacation. NY: Holiday House. 2003.
- Tang, Greg. The Grapes of Math. NY: Scholastic, Inc. 2001.
- Tang, Greg. Math Appeal. NY: Scholastic, Inc. 2003.
- Tang, Greg. Math Fables. NY: Scholastic, Inc. 2004.
- Tang, Greg. Math for All Seasons. NY: Scholastic, Inc. 2002.

**ACCRS: 1.9**

Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

**Mastered:**

Students can count to 120, starting at any number less than 120. In this range they can read and write numerals and represent a number of objects with a written numeral.

**Present:**

Students will compare two numbers using coins and dollar bills.

**Going Forward:**

Students will compare and contrast two numbers using a Venn diagram. Using the Venn diagram, students will write a riddle about the numbers to share with classmates.

**Present and Going Forward Vocabulary:**

Numeral,  $>$ ,  $<$ , digit, sum, number sentence



**Career Connections:**  
Teacher, Mathematician, Census Taker, Cashier

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**Comparing Numbers and Money**

**Student Instructions:**

1. Draw two number cards from a deck of cards numbered from 1-120.
2. Make a number sentence and write the sum.
3. Use coins to represent the sum of the number sentence.
4. Repeat.
5. Now compare the two numbers using the appropriate symbol,  $<$ ,  $>$ , or  $=$ .  
Example: You draw 26 and 52 from the deck.  $26 + 52 = 78$ .  
Next, represent 78 using money.  $\$.78 = 3$  quarters + 3 pennies.  
Now, choose two more number cards from the deck and repeat.  
This time, you draw 5 and 27 from the deck.  $5 + 27 = 32$ .  
Represent  $\$.32$  using money.  $\$.32 = 1$  quarter, 1 nickel, and 2 pennies.  
Compare the two different amounts using the symbols  $<$ ,  $>$ , or  $=$ .  
 $\$.78 > \$.32$ .

**Materials needed:**

- Digit cards from 1 -120 (Can be student made from paper or index cards or generated at: <http://www.senteacher.org/Worksheet/9/Number.xhtml>)
- Coins-Pennies, dimes, nickels, quarters,  $\frac{1}{2}$  dollar, dollar.

**Literature Connections/Resources:**

- Franco, Betsy. Counting Our Way to the 100<sup>th</sup> Day. NY: Simon & Schuster. 2004.
- National Library of Math Manipulatives-Counting Money:  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_325\\_g\\_2\\_t\\_1.html?from=grade\\_g\\_2.h\\_tml](http://nlvm.usu.edu/en/nav/frames_asid_325_g_2_t_1.html?from=grade_g_2.h_tml)
- National Library of Math Manipulatives-Hundreds Chart:  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_337\\_g\\_2\\_t\\_1.html?from=grade\\_g\\_2.html](http://nlvm.usu.edu/en/nav/frames_asid_337_g_2_t_1.html?from=grade_g_2.html)
- Senn Teacher Free Teaching Resources- for Special Education- Number Card Generator  
<http://www.senteacher.org/Worksheet/9/Number.xhtml>

**ACCRS: 1.10**

Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

- a. 10 can be thought of as a bundle of ten ones, called a “ten.”
- b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
- c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

**Mastered:**

Students can understand that the two digits of a two digit number represent amounts of tens and ones; that 10 can be thought of as a bundle of ten ones, called a ten; that the numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones; and the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

**Present:**

Students will compare numbers written using base 10 to those written in base 5.

**Going Forward:**

Students will write a humorous story about what happens when “0” takes a vacation or students may explore another base system by converting base 10 numbers to other bases, such as 3,6,7, etc. Then compare similarities and differences in these numbers.

**Present and Going Forward Vocabulary:**

Digit, place value, place holder, convert, base 5, base 10

**Career Connections:**

Teacher, Mathematician, Census Taker

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**Counting and Comparing**

*Student Instructions:* Play “Are You on Base?” and answer the Thought Questions.

1. Choose a number card from a pack numbered from 11–120.
2. Write the number in base ten on the chart provided.
3. Convert the number to base 5 and write the new number on the chart.
4. Use straws and rubber bands to represent the number in both base 10 and base 5.
5. Compare the two numbers. How are they alike? How are they different?
6. Answer the thought questions below.

Thought questions:

- a. Would you rather have 11 pieces of candy in Base Ten or 20 pieces in Base Five? Why?
- b. How does 0 help us to count in both bases?
- c. What would happen if 0 disappeared from our number system?

**Materials needed:**

- Manipulatives such as tooth picks or straws and rubber bands
- Cards 20-120

**TEACHERS: Digit cards can be downloaded, printed, and cut apart at:**

<http://www.senteacher.org/Worksheet/9/Number.xhtml>

**Literature Connections/Resources:**

- Franco, Betsy. *Counting Our Way to the 100<sup>th</sup> Day*. NY: Simon & Schuster. 2004.
- Pulver, Robin. *Punctuation Takes a Vacation*. Pine Plains, NY: Live Oak Media. 2008.

**ACCRS: 1.11**

Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols  $>$ ,  $=$ , and  $<$ .

**Mastered:**

Students can compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparison with the symbols  $>$ ,  $=$ , and  $<$ .

**Present:**

Students will use the relative positions of numbers in writing a fiction story about an animal that did not understand greater than, less than, and equal.

**Going Forward:**

Students will use the symbols in illustrating the quantities that the character in the fiction story did not understand.

**Present and Going Forward Vocabulary:**

Relative position,  $<$ ,  $>$

**Career Connections:**

Author, Artist, Illustrator

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**Missing Signs**

*Student Instructions:* Create a fantasy story about an animal that does not understand the relationship of two-digit numbers.

*Example:* A hen had trouble keeping count of her chicks because she did not know if twenty-six was less than her brood of twenty-seven or more than twenty-seven.

Write at least three different adventures the animal had because of the inability to understand  $>$  (less than),  $<$  (greater than), and  $=$  (equal). Illustrate the story with pictures and number sentences using the symbols. Make sure to show the correct number sentences as well as what the animal thought.

**Literature Connections/Resources:**

- Jenkins, Steve. Biggest, Strongest, Fastest. Solana Beach, CA: Sandpiper Press. 1994.
- Tang, Greg. Math Fables. NY: Scholastic Press. 2004.
- Tompert, Ann. Just a Little Bit. NY: Houghton-Mifflin. 1993.
- Hundreds Chart: [http://nlvm.usu.edu/en/nav/frames\\_asid\\_337\\_g\\_2\\_t\\_1.html?from=grade\\_g\\_2.html](http://nlvm.usu.edu/en/nav/frames_asid_337_g_2_t_1.html?from=grade_g_2.html)

**ACCRS: 1.12**  
 Add within 100, including adding a two-digit number and a one-digit number and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method, and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

<b>Mastered:</b>	<b>Present:</b>	<b>Going Forward:</b>
Students can add within 100, including adding a two-digit number and a one-digit number and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method, and explained the reasoning used. They understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	Students will transfer the adding and subtracting skills to adding and subtracting money.	Students will solve everyday money problems involving two-digit addition and subtraction.

**Present and Going Forward Vocabulary:**  
 Change, allowance, coin value

**Career Connections:**  
 Banker, Salesman, Consumer Activist, Cashier

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**Money Problems TIC-TAC-TOE**

*Student Instructions:* Choose three problems in a row, column or diagonal, just like TIC-TAC-TOE. Then complete the contract to submit to your teacher.

1. Snack and juice cost \$1.50. The first grade class collected \$7.50. If the teacher spends all of the money, how many snacks and juices will she be able to order?	2. How much money did Sam turn in to the lunchroom if he was paying 40 cents for lunch for five days? What are the possible money coin combinations that could be used to represent \$2.00?	3. Ted had \$2.20. He was given \$6.35 for his allowance. How much does he have now?
4. Jamal spends \$1.63 and gives the storekeeper \$5.00. How much change does he get?	5. After spending \$1.50 Ian has 40 cents left. How much did he start with?	6. How much does Pam need to add to 65 cents to make \$1.00?
7. Jose had 75 cents to spend in the class store. He bought a toy car for 35 cents. Did he have enough left to buy another car?	8. Gracie has three coins in her bank. If she has 65 cents, what coins could she have?	9. Mike collects 15 cents per bottle recycling. How many bottles would he need to collect to have 90 cents?

**Literature Connections/Resources:**

- Axelrod, Amy. Pigs Go to the Market. NY: Alladin Publishing. 1999.
- Axelrod, Amy. Pigs Will Be Pigs. NY: Alladin Publishing. 1997.
- Murphy, Stuart. Slugger's Car Wash. NY: HarperCollins Books. 2002.
- National Library of Virtual Manipulatives-Hundreds Chart:  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_337\\_g\\_1\\_t\\_1.html?from=category\\_g\\_1\\_t\\_1.html](http://nlvm.usu.edu/en/nav/frames_asid_337_g_1_t_1.html?from=category_g_1_t_1.html)
- Money: [http://nlvm.usu.edu/en/nav/frames\\_asid\\_325\\_g\\_2\\_t\\_1.html?from=grade\\_g\\_2.html](http://nlvm.usu.edu/en/nav/frames_asid_325_g_2_t_1.html?from=grade_g_2.html)
- Place Value Number Line: [http://nlvm.usu.edu/en/nav/frames\\_asid\\_334\\_g\\_2\\_t\\_1.html?from=grade\\_g\\_2.html](http://nlvm.usu.edu/en/nav/frames_asid_334_g_2_t_1.html?from=grade_g_2.html)
- Seive of Eratosthenes:  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_158\\_g\\_2\\_t\\_1.html?open=instructions&from=grade\\_g\\_2.html](http://nlvm.usu.edu/en/nav/frames_asid_158_g_2_t_1.html?open=instructions&from=grade_g_2.html)

**ACCRS: 1.13**

Given a two-digit number, mentally find 10 more or 10 less than the number without having to count; explain the reasoning used.

**Mastered:**

Students can find 10 more and 10 less that the number without having to count and can explain the reasoning used.

**Present:**

Students will use the skill of finding 10 more or 10 less in checking the adding of another person.

**Going Forward:**

Students will collect box tops or cans as a school fund raiser. They will keep track of how many they have collected by arranging the box tops or cans in groups of 10. After many groups of 10 have been collected, (10 groups of 10), they will use a bag marked "100" in which they will place 10 groups of 10. Continue to collect 10 Box tops or cans per bag until another 100 is reached, and so on.

**Present and Going Forward Vocabulary:**

Verify, accurate, average, average weekly attendance

**Career Connections:**

Quality Control Manager, Attendance Officer, Statistician, Census Taker

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**100 More or Less**

*Student Instructions:* Read the Scenario and work through the problem.

**SCENARIO:** You are the attendance officer in a large school. You are having trouble verifying the data gathered by your assistant. Check the data gathered to see if it is accurate by looking at the notes in the attendance worksheet. If you find a mistake, correct it on the line. You may use manipulatives, drawings, or other material as needed to help verify this.

**Material Needed:** Attendance worksheet

**Extension:** Calculate the average weekly attendance at the school. You may use a calculator or any other strategy you can think of to figure it out.

**Literature Connections/Resources:**

- Fromental, Jean-Luc & Jolivet, Joelle. 365 Penguins. NY: Abrams Books for Young Readers. 2006.
- Polotta, Jerry. One Hundred Ways to Get to 100. NY: Cartwheel Books. 1949.
- Murphy, Stuart. 100 Days of Cool. NY: Harper Collins. 2003.
- National Library of Virtual Manipulatives-Hundreds Board:  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_337\\_g\\_1\\_t\\_1.html?from=category\\_g\\_1\\_t\\_1.html](http://nlvm.usu.edu/en/nav/frames_asid_337_g_1_t_1.html?from=category_g_1_t_1.html)
- NCTM Illuminations-Electronic Abacus: <http://illuminations.nctm.org/activitydetail.aspx?id=8>

**ACCRS: 1.14**

Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method, and explain the reasoning used.

**Mastered:**

Students can subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method, and explain the reasoning used.

**Present:**

Students will create an illustrated booklet showing how numerical grades on papers are connected to understanding multiples of ten and the visualization of that understanding.

**Going Forward:**

Students will show understanding of how multiples of ten relate to scores they may receive on classroom tasks such as Accelerated Reader.

**Present and Going Forward Vocabulary:**

Multiples, range, operations, properties

**Career Connections:**

Artist, Illustrator, Teacher, Statistician

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**The Capture Game**

*Student Instructions:* Use the game board provided on page 3 of the student pages to play The Capture Game.

**Rules of the Game**

1. Place 5 to 10 clear chips over any numbers on the 100s chart.
2. Get a colored teddy bear counter for each player (if playing with a partner).
3. Place your teddy bear counter anywhere on the chart to start.
4. Roll 2 number cubes. Use the numbers rolled in at least 2 number sentences.

Record each number sentence on the student record sheet and circle the one you choose.

*Example:* You roll a 2 and a 5.

You could make either of these number sentences to help you decide how many squares to move.

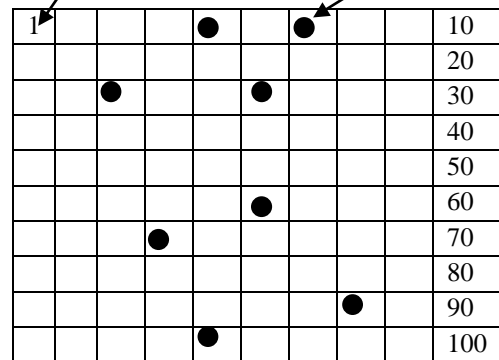
$2 + 5 = 7$ ,  $5 - 2 = 3$

You choose  $5 + 2 = 7$  since that would allow you to land on top of a chip or “capture” it. (See diagram.)

**Student Record Sheet**

	# Sentence 1	# Sentence 2
Roll 1	$2 + 5 = 7$	$5 - 2 = 3$
Roll 2		
Roll 3		
Roll 4		

**Start here. Count over 7. Capture**



5. If you roll a double, you are allowed a “Free Play” meaning you can make any number sentence to capture a chip.
6. Play until 3 chips are captured.

**Materials Needed:**

- Plastic chips or buttons
- Teddy Bear Counters or other game pieces
- 1 pair of dice

**Literature Connections/Resources:**

- Murphy, Stuart. 100 Days of Cool. Murphy, Stuart. NY: Harper Collins. 2003.
- Grizzly Gazette. NY: HarperCollins Children’s Books. 2004.
- National Library of Virtual Manipulatives-Hundreds Chart:  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_337\\_g\\_1\\_t\\_1.html?from=category\\_g\\_1\\_t\\_1.html](http://nlvm.usu.edu/en/nav/frames_asid_337_g_1_t_1.html?from=category_g_1_t_1.html)

**ACCRS: 1.15**

Order three objects by length; compare the lengths of two objects indirectly by using a third object.

**Mastered:**

Students can order three objects by length; compare the lengths of two objects indirectly by using a third object.

**Present:**

Students will make literature connections to math concepts.

**Going Forward:**

Students will write an original story about things in sets of three that are different from one another in size.

**Present and Going Forward Vocabulary:**

Different, comparison, character, apparent size, actual size, galaxy, Hubble

**Career Connections:**

Storyteller, Author, Analyst

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**I Can...**

*Student Instructions:* Choose one or more activities to complete. Research your topic in order to develop the products. You may want to plan your project using the Project Planner.

1. Think of as many stories as you can that have sets of three things that are alike, yet different. List them on the back of this paper. *Example: In the story of Goldilocks, there are three bears in three different sizes. They are all bears, yet each is a different size.*
2. On your own paper, write an original story about three objects or characters of different sizes. What adventures or problems would they have? Pick three of the words in the “word bank” below to help you get started on your size story. Be sure to share it with your teacher!

**Word Bank**

Tomato	Ran	Jumped
Box	Sneezed	Laughed
Flashlight	Tiptoed	Hid
Pillow	Radish	Shoe

3. Read the following explanation, entitled “You are “Thumbbody!” Then follow the directions.

**You are “Thumbbody!”**

*Student Instructions:* Things look bigger up close to you and smaller as they get further away. Hold up your thumb. Hold it at arm’s length. Looking at your thumb, try to cover a distant object with it. In your classroom, what objects can you “cover” using this method. In other words, what objects appear to be the size of your thumb? The further away things are, the smaller they look...so ask your teacher if you can step outside the classroom into the hall for a moment. Hold up your thumb. What objects are the size of your thumb out in the hallway? Is there a person far enough down the hall to be the size of your thumb? A great telescope, called the Hubble, once took a photograph of the sky, making a picture of a piece of the sky the same size as your thumb held at arm’s length away from your eye.

Go to this Web site to see this picture and others showing whole galaxies (families of stars) in one “tiny” piece of the sky.

<http://hubblesite.org/gallery/album/entire>

On your own paper, make a list of things that are “apparently” the same size as your thumb. Explain the difference between apparent size and actual size.

**Literature Connections/Resources:**

- Galdone, Paul. The Three Bears. Englewood, FL: Sandpiper Press. 1985.
- Seibert, Patricia. The Three Little Pigs. Worthington, OH: Brighter Child Publishing. 2002.
- Disney, RH. Snow White and the Seven Dwarfs. NY: Random House. 2009.

**ACCRS: 1.16**

Express the length of an object as a whole number of length units by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*

**Mastered:**

Students can express the length of an object as a whole number of length units by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.

**Present:**

Students will measure using body-lengths, recreating development of the “foot” and “yard.”

**Going Forward:**

Students will create and compare measurement systems.

**Present and Going Forward Vocabulary:**  
Measurement, length, standard

**Career Connections:**  
Surveyor, Statistician

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**How Do You Measure Up?**

*Student Instructions:* Using scissors, cut a straw the same length as your thumb. (Lay your thumb against a straw, then mark with a marker and cut the straw.) Now, put another straw against your foot, mark and cut it the same length as your foot. Now, measure ten items in the classroom using your “thumb ruler.” Write your results in the chart below. Measure the same ten objects using your “foot” ruler and write the results in the chart below:

Name of Object	How Many Thumbs?	How Many Feet?
1.		
2.		

Extension 1: How many “thumb” lengths are there in one of your “feet” rulers? Get a piece of yarn and make a ruler of “thumbs” the same length as your “foot.” Use this to make measurements of two more objects.

Could you use a longer measurement? Tired of trying to measure long objects or distances with your foot ruler? What longer measurement “stick” could you invent? Someone once put three feet together and called it a “yard.” Do you have a better idea? What would it be? How would it make measuring long objects easier?

Extension 2: Brainstorm ways people measure different things. How many different ways to measure can you think of?

People have developed many different ways of measuring distance, weight, volume (liquid), speed, power, and energy, to name a few. Do you know the ones listed below? Can you list others? Ask adults that you know to name measurement units that they know. Some ancient ways of measuring power and energy are still used today. *Example: Engine power for automobiles is measured in “horse power.”*

Research other ancient ways of measuring things. Find out how these measurements got their names, what they measure, and if they are still used today.

Ancient Measurement	How It Got Its Name	What it Measures	Still in Use Today?
<i>Horse Power</i>	<i>Horses were once used to pull loads.</i>	<i>Engine power</i>	<i>Yes</i>

This lesson was adapted from SAVI/SELPH, a science/math curriculum developed by the Lawrence Hall of Science for children with special needs/disabilities.

**Literature Connections/Resources:**

- <http://www.hemyockcastle.co.uk/measure.htm>
- [http://en.wikipedia.org/wiki/History\\_of\\_measurement](http://en.wikipedia.org/wiki/History_of_measurement)



**ACCRS: 1.17**

Tell and write time in hours and half-hours using analog and digital clocks.

**Mastered:**

Students can write time in hours and half-hours using analog and digital clocks.

**Present:**

Students will use time to communicate.

**Going Forward:**

Students will research the rationale behind a.m. and p.m.

**Present and Going Forward Vocabulary:**

Antemeridian, a.m., post meridian, p.m., eastern, western

**Career Connections:**

Author, Astronomer, Solar Physicist

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**I Can...**

*Student Instructions:* Choose one or more of the activities. When you are finished, give your teacher the student pages with your work, along with this page.

1. Tell and Write a Time Story  
Fill in the blanks! It's YOUR story!

Once upon a time, I woke up in the morning at \_\_\_\_:\_\_\_\_ a.m. Since it was the weekend, I bounced out of bed. On weekends, I like to \_\_\_\_\_ at \_\_\_\_\_ a.m. (Suggestions: eat breakfast, watch TV, play with someone, get to your sporting event or game, go to church, mosque, synagogue, etc., do chores, color with crayons- whatever you like!...)

By lunchtime, I was tired and ready for something to eat. Lunchtime for my class at school is usually at \_\_\_\_\_ (a.m. or p.m.?) But this is a weekend, so I ate at \_\_\_\_\_ (a.m. or p.m.?)

At \_\_\_\_\_ p.m. that afternoon, I \_\_\_\_\_. It was fun!

We had supper at about \_\_\_\_\_ p.m. that evening. Then, we \_\_\_\_\_ until bedtime at \_\_\_\_\_ p.m. that night.

That's my day! Bye!

2. Find out more about the terms a.m. and p.m. by doing independent research. Use the Internet and other sources to find out about the terms, a.m. and p.m. Is 12:00 a.m. noon or midnight? Why? What about 12:00 p.m.? Why is it important to know the difference? Can you think of an easy way to communicate what time is meant when something is happening at 12:00?
3. Brainstorm as many sayings as you can think of that have to do with time. Pick three and illustrate to show what the sayings mean.  
*For example: It's about time! That was bad timing*
4. Make a "Time invention."  
Using the grid below, choose three combinations and make an invention for each one. For example, you might combine the scissors and the clock and invent a new kind of clock shaped like scissors, or maybe you would combine the scissors and clock to make scissors that can time a person cutting paper or...YOUR inventions!

	Watch	Clock	Computer
Scissors			
Bean bag chair			
Flashlight			

When you finish, draw one of your "prototypes" (new inventions) here.

(Adapted from a Mensa workshop idea.)

OR

**Time for Thinker Keys**

The theme is time! Here are 12 keys to answer, one for each hour on a clock face! Use your own paper to answer each question...

1. What if clocks had never been invented?
2. Combine a clock with a toothbrush. How could this be useful? What would it look like and why would people buy it?
3. List five places you find clocks and five places you don't find clocks.
4. List ten uses for clocks.
5. What could we use to keep time if we didn't have electricity or batteries?
6. What is the most modern clock you have ever seen? What is the most old-fashioned clock you have ever seen? What is the most old-fashioned clock you have ever heard of?
7. What is the silliest clock you can imagine? Draw it or tell about it in words.
8. What are the disadvantages of clocks? In other words, when would people NOT want to use a clock?
9. Create an alphabet book about time and clocks.
10. What will clocks look like in the future?
11. How could you use a rubber band as a clock?
12. People have used many things to keep time, including sand, water, gears, electricity, computers, and the sun. What kind of time keeping device would you invent? What jobs would it do and how would it work?

**Literature Connections/Resources:**

- <http://wvp.greenwichmeantime.com/info/noon.htm>
- <http://inventors.about.com/library/weekly/aa071401a.htm>
- Burns, Marilyn. This Book is About Time. St. Cloud, MN: Little, Brown, & Co. (Juv). 1978.
- Older, J. Telling Time: How to Tell Time on Digital and Analog Clocks! Watertown, MA: Charlesbridge Publishing, Inc. 2000.
- Sweeney, J. Me Counting Time: From Seconds to Centuries. Victoria, BC: Dragonfly Books. 2001.

**ACCRS: 1.18**

Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

**Mastered:**

Students can organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

**Present:**

Students will interpret data with eight categories.

**Going Forward:**

Students will collect data and interpret it.

**Present and Going Forward Vocabulary:**

Vote, data, survey

**Career Connections:**

Statistician, Pet Shop Owner

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)**Class Pet**

*Student Instructions:* Read the scenario and solve the problems.

**SCENARIO:** Mrs. Smith, your teacher, told your class that you could vote on a new class pet. It has to live in a ten gallon aquarium and not need much care over the weekends. Your class researched pets and decided that a hermit crab, turtle, gecko, rat snake, mouse, gerbil, rat, and hamster fit the criteria. Then, the class voted on their choices for class pet. The chart below gives the results.

Billy	Boy	Turtle
Jill	Girl	Hamster
Jaquees	Girl	Mouse
Tomas	Boy	Rat Snake
Tavarius	Boy	Gecko
Syndy	Girl	Hamster
Alex	Boy	Gerbil
Violet	Girl	Rat
Robby	Boy	Hermit Crab
Kyla	Girl	Hamster
Montrel	Boy	Rat Snake
Chris	Boy	Gecko
Katie	Girl	Gerbil
Marcus	Boy	Turtle
Carl	Boy	Gerbil
Maria	Girl	Hamster
Davin	Boy	Gecko
Lucy	Girl	Hermit Crab

*What to Do:* Before answering questions 1 & 2, read and think about the “Thought Questions” to organize your graph.

1. Organize the table above so that Mrs. Smith can easily see whether girls or boys were more interested in a certain pet.
2. Then organize the information from the table into a graph for the teacher to look at. What pet will your class get?

**Thought Questions to organize your graph:**

- a. What kind of graph would work best to give Mrs. Smith the information she needs? Pictograph? Bar graph? Line graph?
- b. What information will you put on the horizontal axis? The vertical axis?
- c. What will be the title of your graph?

**Extension:** Represent and Graph Data

OK, it's your turn! What would you like to know about your class? Would you like to know who likes a certain Saturday morning television show? Would you like to know who wants to go on a field trip to the zoo? Think of your own question and write it here:

---

Now, show your question to your teacher and ask if you have permission to survey (ask) your classmates for answers. Make your own graph below to record your classmates' answers. Good luck!

**Literature Connections/Resources:**

- Griffiths, Rose. First Step Math Facts and Figures. Milwaukee, WI: Gareth Stevens, Inc. 1994.
- National Library of Math Manipulatives-Bar Graphs:  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_323\\_g\\_2\\_t\\_5.html?from=category\\_g\\_2\\_t\\_5.html](http://nlvm.usu.edu/en/nav/frames_asid_323_g_2_t_5.html?from=category_g_2_t_5.html)
- National Library of Math Manipulatives-Pie Charts:  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_183\\_g\\_1\\_t\\_5.html?open=activities&from=category\\_g\\_1\\_t\\_5.html](http://nlvm.usu.edu/en/nav/frames_asid_183_g_1_t_5.html?open=activities&from=category_g_1_t_5.html)

**ACCRS: 1.19**

Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

**Mastered:**

Students can distinguish between defining attributes versus non-defining attributes; and, can build and draw shapes to possess defining attributes.

**Present:**

Students will explore how attributes can help one classify shapes and figures.

**Going Forward:**

Students will construct shapes and figures with various attributes.

**Present and Going Forward Vocabulary:**

Attributes, polyhedras, quadrilaterals, inclined plane, roll, slide

**Career Connections:**

Civil Engineers, Graphic Designer, Architect

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)**A Shape Book**

(Polygons)

*Student Instructions:* Cut soda straws into various links. Cut chenille into 3 inch strips. Make as many different triangles as possible from three straws and three chenille strips. Is it possible to combine three straws and not have a closed figure? Why or why not?

Sort the triangles into groups. Draw and label each group with describing words.

Repeat with four straws (quadrilaterals), five straws, six straws, etc.

Polyhedra

*Student Instructions:* Use various numbers of multi-link cubes to form three dimensional shapes. Sort the polyhedras. Draw, describe, and label each three-dimensional figure. Use construction paper and plain paper to construct a booklet to hold all the shape pictures you made. Make sure to include the description for each shape. Put the names of the shapes on the pages of the booklet.

**Materials needed:**

1. Soda straws cut into various lengths.
2. Chenille strips cut into three inch strips.
3. Construction paper and plain paper for the booklet.

OR

**Slide? Roll? Slide 'n Roll?**

*Student Instructions:*

1. Build a simple, inclined plane (ramp) from materials available in your classroom, such as stacked books and a board or use an existing inclined plane such as the playground slide to test different polyhedrons for their ability to slide or roll.
2. Gather a variety of three-dimensional polyhedrons, such as a pyramid, cylinder, sphere, etc. (You can also use everyday, three-dimensional objects from the classroom, such as pencils, rulers, crayons, balls, erasers, etc.)
3. Follow the directions on the data sheet.
4. Use your data to answer the Thought Questions.

**Thought Questions:**

1. Which of the shapes rolled? Which ones slid? Which ones both rolled and slid?
2. In what ways were the shapes that rolled alike?
3. In what ways were the shapes that slid alike?
4. How is it possible for some objects to roll AND slide?
5. Based on your observations, make an educated guess (hypothesis) about what traits a shape must have in order to roll, slide, or roll AND slide.

**Materials Needed:**

- Inclined plane (made from a stack of books and a board or other commonly available items from the classroom) or use playground slide

- Assortment of three-dimensional shapes
- Everyday objects from the classroom in various three-dimensional shapes

**Recording the Data**

*Student Instructions:*

1. Write the name of the object or shape in Column 1.
2. Predict if the object or shape will slide, roll or slide *and* roll. Write an S for slide, R for roll, or SR for slide and roll.
3. Place the object or shape at the top of your inclined plane and observe.
4. Place a check mark in the appropriate box in either Column 3, 4, or 5.
5. Answer the “Thought Questions” on Page 1 using the data from this table.

Data Sheet for Slide? Roll? OR Slide 'n Roll				
Object or Shape	Prediction (S, R, or SR)	Slide	Roll	Slide and Roll

**Literature Connections/Resources:**

- Falwell, Cathryn. Shape Space. NY: Houghton Mifflin Harcourt (HMH). 1992.
- Loban, Tana. Shapes, Shapes, Shapes . Greenwillow Books. 1998.
- Loban, Tana. Cubes, Cones, Cylinders, & Spheres. Greenwillow Books. 2000.
- Grade specific geometry and spatial games: <http://www.ixl.com>

**ACCRS: 1.20**

Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. (Students do not need to learn formal names such as right rectangular prism.)

**Mastered:**

Students can compose two-dimensional shapes and three dimensional shapes to create a composite shape; and compose new shapes from the composite shape.

**Present:**

Students will construct a two- or three-dimensional shape.

**Going Forward:**

Students will design shapes according to given attributes and name them specifically.

**Present and Going Forward Vocabulary:**

Dimension, two-dimensional, three-dimensional, figure, structure, defining characteristics, designing characteristics, pyramid, prism, angles, faces, quadrilateral, pentagon, hexagon

**Career Connections:**

Architect, Graphic Designer, Builder

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**Designer**

*Student Instructions:*

1. Flip a coin to see if you will design a two-dimensional figure or a three-dimensional figure. Heads means two-dimensional; tails means three-dimensional. (For two-dimensional you will simply draw the

- design so that it has length and width. For three-dimensional you will tape shapes together to make a structure so that it has length, width, and height.)
2. Draw a card to define the shape.  
Draw designing cards to tell the color and size of the figure or structure.  
Design a structure to match the defining characteristics and designing characteristics.
  3. Tell how the structure could be used in our world.

**Materials needed:**

- A set of cards with five each: two-dimensional and three-dimensional
- A set of defining cards for two-dimensional figures: three sides, four sides, five sides, six sides, seven sides, eight sides, nine sides, ten sides, three angles, four angles, five angles, six angles, seven angles, eight angles, nine angles, ten angles
- A set of defining cards for three-dimensional: triangular faces, quadrilateral faces, pentagonal faces, cube, triangular prism, pyramid
- A set of cards identifying the color: red, yellow, blue, green, purple, orange, brown, black, white, your own color choice
- A set of cards describing the size of the figure: big, medium small, tiny

**Literature Connections/Resources:**

- Burns, Marilyn. *The Greedy Triangle*. NY: Scholastic, Inc. 1995.
- Illuminations-Shape Cutter: <http://illuminations.nctm.org/activitydetail.aspx?id=72>
- <http://illuminations.nctm.org/activitydetail.aspx?id=35>

**ACCRS: 1.21**

Partition circles and rectangles into two and four equal shares; describe the shares using the words *halves*, *fourths*, and *quarters*; and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

**Mastered:**

Students can partition circles and rectangles into two and four equal shares; describe the shares using the words halves, fourths, and quarters; and can use the phrases half of, fourth of and quarter of; describe the whole as two of, or four of the shares; and, understand for these examples that decomposing into more equal shares creates smaller shares.

**Present:**

Student will apply partitioning in real life situations.

**Going Forward:**

Students will create wholes with various fraction shares.

**Present and Going Forward Vocabulary:**

Ingredients, shares, fair trade, fractions

**Career Connections:**

Restaurant Manager, Chef, Pizza Maker, Business Manager

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)

**Mama Mia, More Pizza**

*Student Instructions:* Read the Scenario and work through the problem.

**SCENARIO:** As the top pizza chef at Mama Mia’s Pizza Parlor, you have been challenged to expand the menu with every possible variety of pizza. Each pizza may have only one topping: mushroom, pepperoni, cheese, sausage, etc. Use your creative chef instincts to think of other possible toppings.

1. Make a variety of pizzas using large circles and paper cut-outs for the ingredients. Each pizza may have only one topping: mushroom, pepperoni, cheese, sausage, etc.
2. Using a sample template, cut some of the pizzas into halves and some into fourths.

3. Trade the pizza pieces so that there are as many pizza combinations as possible to add to the pizza menu. (For example, one menu selection could be one-half pepperoni and one-half mushroom, another could be one-fourth mushroom, one-fourth cheese, and one-half sausage.)
4. After all possible pizzas are made, design a menu that lists all the different possibilities and pictures to illustrate them.

**Materials needed:**

- Paper circles or paper plates
- Paper cut-outs to represent mushrooms, pepperoni, shredded cheese, anchovies, bell pepper, etc.
- Scissors, paper, writing tool

**Literature Connections/Resources:**

- Murphy, Stuart. Give Me Half. NY: Math Start, HarperCollins Children's Books. 1996.
- Gifford, Scott. Piece=Part=Portion. Berkley: Tricycle Press. 2007.
- National Library of Virtual Manipulatives: "Pie Chart" at:  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_183\\_g\\_1\\_t\\_5.html?open=activities&from=topic\\_t\\_5.html](http://nlvm.usu.edu/en/nav/frames_asid_183_g_1_t_5.html?open=activities&from=topic_t_5.html)