

ALCCRS: K.1-K.7

K.1: Count to 100 by ones and by tens.

K.2: Count forward beginning from a given number within the known sequence (instead of having to begin at 1).

K.3: Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

K.4: Understand the relationship between numbers and quantities; connect counting to cardinality.

K.5: Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle; as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

K.6: Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. (include groups with up to ten objects).

K.7: Compare two numbers between 1 and 10 presented as written numerals.

Mastered:

Students can count to 100 by ones and by tens; count forward beginning from a given number within the known sequence (instead of having to begin at 1); write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects); understand the relationship between numbers and quantities; connect counting to cardinality; count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects; identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies; and, compare two numbers between 1 and 10 presented as written numerals.

Present:

Students will demonstrate awareness of numerical operations and develop a sense of numbers and their relationships to one another by the manipulation of objects in a variety of contexts.

Students will answer problem solving questions pertaining to less than, greater than and equal to and they will be able to explain them using math vocabulary terms.

Going Forward:

Students will demonstrate knowledge of whole numbers by using correct math vocabulary and counting forward from a given number using one-to-one correspondence.

Present and Going Forward Vocabulary:

100’s chart, ones, tens, fives, skip counting, pattern, count, number, numeral, digit, first, second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, last, next, same, equal, more (than), most, less (than), least, estimate, equation..

Career Connections:

Mechanical Engineer, Aerospace Engineer, Construction and Building Inspectors, Surveyors, Computer Software Engineer, Graphic Designer, Architect

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

Number “Sense” Tic-Tac-Toe

Student Instructions: Choose three activities in a row, column, or diagonal, just like TIC-TAC-TOE. Then complete the contract and give it to your teacher. Use the organizational tools provided in the Student Pages.

1. Change the number 100 into a picture. (See 100 Activity Page.)	2. Make an ABC book using the following sentence starter: Numbers make me want to _____.	3. Create model numerals using markers and newsprint. Decorate each one differently.
4. Ten Ways Make up and illustrate at least 10 different math problems using greater than, less than, and equal to.	5. Student Choice	6. Make a number book using words, pictures and numbers to 100 by counting by tens.
7. Draw a picture showing three ways you used math at home this week.	8. Make 20 ants using sticky dots and write the numeral for each ant. <u>Questions to Answer:</u> A. How many ant legs are there altogether? B. If half the ants crawl one way, and half crawl in the opposite direction, how many ants are crawling each way?	9. Make a number book by drawing your favorite foods using ordinal numbers to 10. (First, second, third...)

I choose to do #s _____, _____, and _____.

Literature Connections/Resources:

- Baker, Keith. Quack and Count. Boston: Sandpiper Publishing. 2004.
- Pinczes, Elinor. One Hundred Hungry Ants. Boston: Sandpiper Publishing. 1999.
- Carle, Eric. Ten Little Rubber Duckies. NY: Harper Collins. 2003.
- Crews, Donald. Ten Black Dots. NY: Greenwillow Books. 1995.
- Anno, Mitsumasa. Anno’s Counting Book. NY: Harper Collins. 1986.
- Walsh, Ellen Stoll. Mouse Count. Boston: HMH Books. 1995.
- Harris, Trudy. Pattern Fish. Minneapolis: Millbrook Press. 2000.
- <http://coolmath4kids.com/>
- <http://www.apples4theteacher.com/math/>
- <http://www.jmeacham.com/math/math.htm>
- <http://cut-the-knot.org/>
- <http://mathwire.com/>

<p>ALCCRS: K.8 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem. This applies wherever drawings are mentioned in the Standards.)</p>		
<p>Mastered: Students can represent addition and subtraction with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations.</p>	<p>Present: Students will estimate numbers without counting, and then check their estimates by counting by tens.</p>	<p>Going Forward: Students will play a similar game to “Have a Heart, using a 10s frame” in which each rectangle represents 10.</p>
<p>Present and Going Forward Vocabulary: Estimating, subtizing, visual, amounts</p>		

Career Connections:
 Policeman, Playground Supervisor, Banker

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

Have a Heart Game: Estimating visual amounts (Subtizing)

Student Instructions: The grid below is called a “**10s**” **Frame**. Use it to play the game.

Materials: A partner, a 10s Frame, and a crayon **or** stickers.

Student Directions: You and your partner draw any amount of hearts on the grid, drawing only one in each box. Hold up your 10s frames at the same time. As fast as you can, say out loud the number of hearts you think are on your partner’s frame. Then, count to see if your estimate was correct. Explain to your partner how you were thinking as you made your estimate. Were you close or not close? Keep score and repeat as many times as you want.

Tens Frame Grid

Literature Connections/Resources:

- McGrath, B. The M & M Brand Counting Book. Watertown, MA: Charlesbridge Publishing. 2002.
- Crews, S. Ten Black Dots. NY: Greenwillow Press. 2010.

<p>ALCCRS: K.9 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.</p>		
<p>Mastered: K.9 Students can solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.</p>	<p>Present: Students will use creative production to apply, analyze, and synthesize self-made math problems and show how math is used in the real world.</p>	<p>Going Forward: Students will use works of art, viewed on the Internet to create a personal <i>Math-terpiece</i> book. They will challenge classmates to work out the word problems in their book.</p>
<p>Present and Going Forward Vocabulary: Row, column, diagonal</p>		

<p>Career Connections: Lunchroom Helper, Teacher, Banker, Ice Cream Man.</p>

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

Five Alive! TIC-TAC-TOE MENU

Student Instructions: Choose three activities in a row, column, or diagonal, just like TIC-TAC-TOE. Complete the contract to give to your teacher. You may want to plan your products using the organizational tool, Primary Project Planner.

1. Make a number sentence for "5." You can write or draw your story, or tell it into the computer using the microphone. Sample: $2+3 = 5$ Sally had two pencils, then her brother gave her three more. How many pencils does she have?"	2. Tell a story about how 5 turned into 2. What happened? Make your story exciting and interesting to others. Show the number sentence at the end of your story.	3. List all the ways you make 5 by adding.
4. List at least ten ways to make 5 by subtracting.	5. How many ways can you think of to make 10? List them.	6. Using the plastic counters in your classroom (or the building cubes) make "number sentences" for a friend to read.
7. Write a word problem for a friend to solve that uses the numbers 5 and two other numbers.	8. List all the places you find sets of five.	9. Draw a picture that includes sets of five.

Count! Think Fast

Student Instructions: Answer the questions at each letter in the boxes. Answers must start with the letter in the box in Column 1. Write or draw your answers as quickly as possible on a separate piece of paper or say them into a tape recorder. Keep track of each thing you count with a tally mark in Column 4.

Example: The answers for the first activity must start with the letter "C." "class," "counters." How many of these can you complete?

Tally here

C	How many objects that start with "C" can you find in your classroom?	C	
O	How many open containers do you see in your classroom?	O	
U	How many things in your room are up near the ceiling?	U	
N	How many new things can you see in your classroom?	N	
T	Find ten things that are red.	T	

Literature Connections/Resources:

- Walsh, E. Mouse Count. NY: Harcourt. 1991.
- Tang, G. Math-terpieces. NY: HarperCollins. 2009.
- Art Masterpieces for Kids: <http://gardenofpraise.com/art.htm>

ALCCRS: K.10

Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).

Mastered:

Students can decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).

Present:

Students will apply the skill using addition in a game and analyze strategies used to answer questions about the game.

Going Forward:

Students will play the game using a combination of operations, such as adding, subtracting, multiplying, and dividing.

Present and Going Forward Vocabulary:

Deck, stack, overturned, amount, face, figure

Career Connections:

Cashier, Teacher, Mathematician

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

Student Instructions: Play the game, “Go Figure.”

How to Play: Up to four people may play this game together. Deal seven cards from a deck (teacher: remove J/Q/K cards) (or use Web site below to generate number cards). Put the rest of the cards face down on the table between you. Turn a card over and put it on the table.

Look at your cards to see if you can make the amount on the overturned card. If you need 10, you can play any number of the cards, but cannot be over or under the value of the card you played. In this example, one person might play a 5, a 2 and a 3. The other person might play a 9 and a 1.

If someone does not have the cards needed to make the number, he or she can “Go Figure” and pick from the deck pile until they have an amount that equals the overturned card. When everyone has laid their cards on the table for that turn, flip over another card and play a second round. The winner is the first person to play all of the cards in their hand.

Note Teachers: if regular playing cards are not allowed in your school, index cards with numerals written on them will work the same way.

Literature Connections/Resources:

- McGrath, B. The M & M Brand Counting Book. Watertown, MA: Charlesbridge Publishing. 2002.
- Crews, S. Ten Black Dots. NY: Greenwillow Press. 2010.
- Pinczes, Elinor. One Hundred Hungry Ants. Boston: Sandpiper Publishing. 1999.
- Sen Teacher Free Teaching Resources- Number Card Generator
<http://www.senteacher.org/Worksheet/9/Number.xhtml>

ALCCRS: K.11

For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

Mastered:

Student can, for any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

Present:

Student will choose at least one activity from the “I Can” menu to complete.

Going Forward:

Add other suggestions to the “I Can” list.

Present and Going Forward Vocabulary:

Research, equations

Career Connections:

Author, Illustrator, Game Designer

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. Make a collage of people who use math in their careers. Cut pictures from magazines, take photographs, draw your own pictures, or cut and paste pictures using the computer. Glue pictures to a half poster board. Be ready to explain how each person in your collage uses math to do his or her job.
2. Draw a “number picture.” Draw cars or stars or flowers or whatever you like. Make math equations in the picture: draw some objects red and some blue, or some big and some little. See if your teacher or classmates can guess the equation in your drawing.
3. Make a game using the counting markers in your math kit. Explain the rules to a partner and play your game.
4. Check out a math book from the school library. Read it and tell your teacher about it.
5. Look for math at home. List all the places you find numbers and math around your home. Ask an adult to help you make a list to share in class.
6. How many squares on a checker board? How many pieces does each player have to start? How many of the squares can you actually put your checker piece on during the game?
7. How many students in your classroom? So, how many shoes are there in your room? How many pony tails? How many people wearing blue? How many fingers?
8. Play “I spy” with a friend. Look for a number of objects and then see if your friend can guess your object. For example: “I spy seven...” (sprinklers in the ceiling).

Literature Connections/Resources:

- www.sheppardsoftware.com/mathgames
- Clemson, Wendy. *Digging for Dinosaurs*. NY: Gareth Stevens Publishing. 2007.
- Clemson, Wendy. *Fire Fighters to the Rescue*. NY: Gareth Stevens Publishing. 2007.
- Clemson, Wendy. *Ocean Giants*. NY: Gareth Stevens Publishing. 2007.
- Clemson, Wendy. *Rocket to the Moon: Math Adventures*. NY: Gareth Stevens Publishing. 2007.
- Clemson, Wendy. *Using Math to Fly a Jumbo Jet*. NY: Gareth Stevens Publishing. 2004.
- Clemson, Wendy. *Zookeeper for a Day: Math Adventures*. NY: Gareth Stevens Publishing. 2007.
- Hopkinson, Deborah. *Fannie in the Kitchen: The Whole Story from Soup to Nuts of How Fannie Farmer Invented Recipes with Precise Measurements*. NY: Aladdin. 2004.

ALCCRS: K.12

Fluently add and subtract within 5.

Mastered:

Student can fluently add and subtract within 5.

Present:

Apply skill to store setting using adding and subtracting up to \$1.00

Going Forward:

Make change for amounts up to \$1.00 in the store setting.

Present and Going Forward Vocabulary:

Dollar, quarter, dime, nickel, cost, inventory, change, receipt, ledger, sales

Career Connections:

Business Owner, Economist, Cashier, Accountant

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

Run Your Own Store

SCENARIO: You have recently purchased your own store. As the owner, you must price each object and create a sign advertising items for sale and listing prices. These items can be any manipulatives commonly present in your classroom: counting bears, blocks, markers, discs, etc. You and your employees will create receipts for each purchase. Then, during “centers” time, run the store: sell items to classmates using facsimile money, keep track of “inventory,” fill out receipts for purchases, and record total sales.

Student Instructions: Follow the steps below to set up and operate your business.

1. Set up your inventory by choosing goods to sell from a variety of things that are already in your classroom. Inventory is the items you have in your store to sell.

Example: Your inventory can be any manipulatives commonly present in your classroom: counting bears, blocks, markers, discs, etc.

2. Price each object or set of objects.
3. Create a sign from construction paper advertising items for sale and listing prices.

Example Price List:

<i>Juan's Variety Store</i>	
Price List	
Pencils	\$ 1.00 each
Bears	\$1.00 each
Blocks	\$2.00 each

4. Make up receipts to give the customers who buy things from your store.

Example Receipt:

Receipt	
<u>Bears</u>	<u>\$1.00</u>
<u>Blocks</u>	<u>\$2.00</u>
Total =	<u>\$3.00</u>

5. During “centers” time, run the store, selling items to classmates using pretend money. Don't forget to give each customer a receipt!
6. Keep track of inventory and record sales in a ledger. (Sales is the **total amount of money** you take in from customers each day and ledger is **the book in which you keep the sales records**.)

Example Ledger Entries:

Total Sales		
<u>Date</u>		<u>Sales</u>
Monday	9/8/12	\$10.00
Tuesday	9/9/12	\$12.00

Literature Connections:

- Harvey, Matt. Shopping with Dad. Cambridge, MA: Barefoot Books. 2010.
- Axelrod, Amy. Pigs Go to Market: Fun with Math & Shopping. NY: Simon & Schuster. 1999.
- Dynamath Magazine. NY: Scholastic.

ALCCRS: K.13

Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Mastered:

Students can compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Present:

Students will compose and decompose numbers by writing equations.

Going Forward:

Students will compose and decompose larger numbers using equations.

Present and Going Forward Vocabulary:

Equals, equations

Career Connections:

Teacher, Mathematician

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

Student Instructions: Think of a number between 11 and 19. Write it at the top of the page. How many ways to equal that number can you think of? Make a list. It might look like this:

$$10 + 1 = 11$$

$$6 + 5 = 11$$

$$111 - 100 = 11$$

$$11 \times 1 = 11$$

Try this as a game with a partner. Who can think of the most equations in one minute? (Ask your teacher if you may borrow the timer.) Need more time? Try two minutes!

Literature Connections/Resources:

- Baker, Keith. Quack and Count.
- Merriam, Eve. Twelve Ways to Get to 11. NY: Aladdin. 1996.
- Zeifert, H. A Dozen Dogs. NY: Random House. 1985.
- <http://illuminations.nctm.org/ActivityDetail.aspx?ID=75>
- <http://coolmath4kids.com/>
- <http://www.jmeacham.com/math/math.htm>
- <http://cut-the-knot.org/>
- <http://mathwire.com/>

ALCCRS: K.14-K.16

K.14: Describe measurable attributes of objects such as length or weight. Describe several measurable attributes of a single object.

K.15: Directly compare two objects, with a measurable attribute in common, to see which object has “more of” or “less of” and describe the difference.

Example: Directly compare the heights of two children, and describe one child as taller or shorter.

K.16: Classify objects into given categories; count the number of objects in each category, and sort the categories by count. (Limit category counts to be less than or equal to 10.)

Mastered:

Students can describe measurable attributes of objects such as length or weight; describe several measurable attributes of a single object; directly compare two objects, with a measurable attribute in common, to see which object has “more of” or “less of” and describe the difference; classify objects into given categories; count the number of objects in each category, and sort the categories by count.

Present:

Students will understand the difference in objects by lengths, weight, and volume.

Going Forward:

Students will demonstrate knowledge of length, weight, and volume of objects by using correct math vocabulary.

Present and Going Forward Vocabulary:

Tall, taller, tallest, long, longer, longest, heavy, heavier, heaviest, light, lighter, lightest, height, weight, volume, capacity, full, empty, contain, less, most, more, least, few, compare

Career Connections:

Computer Programmer, Architect, Engineer, Translator

1. Use the Student Page to make a chart or graph of the heights of students in your class. Arrange them from tallest to shortest. Post your chart or graph on the wall. Then answer these questions using your chart or graph.
 - How many are taller than you?
 - How many are shorter than you?
 - What is the most common height (mode) in your class?
 - Who is the tallest boy?
 - Who is the shortest girl?

Bonus: What is the range of heights in your class?
Hint: Subtract the shortest height from the tallest height. The difference is the range.
2. Make a book about the attributes of objects using lengths. Use the sentence starter:
A _____ is long but a _____ is longer. (See student activity page #2 for complete instructions.)
3. Make a book about the attributes of objects using height. Use the sentence starter:
A _____ is tall but a _____ is taller. (See student activity page #3 for complete instructions.)
4. Make a chart of 5 things in your classroom and describe the attributes of each object. How are they alike and different? Use a Venn diagram to compare any two of your objects. (You can also play guess my object with this activity.)
5. Write an Important Book about being tallest or shortest. (See student pages in Appendix A for complete instructions and templates.)

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.

Literature Connections/Resources:

- Barrett, Judi. Things that Are the Most in the World. NY: Athenium Books. 2001.
- Brown, Margaret. The Important Book. NY: Harper Collins. 1949.
- Dodds, Dayle Ann. The Shape of Things. Somerville, MA: Candlewick Press. 1996.
- Hutchens, Pat. The Doorbell Rang. NY: Greenwillow Books. 1989.
- Murphy, Stuart. Math Start, Level 1 & 2. NY: Harper Collins. 2003.
- Murphy, Stuart. Lemonade for Sale: Math Start 3. NY: Harper Collins. 1997.
- Sheffield, Stefanie. One Monday Morning. NY: Farrar, Straus, & Gireoux. 2003.

ALCCRS: K.17

Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.

Mastered:

Students can describe objects in the environment using names of shapes and describe the relative positions of the objects using terms such as above, below, beside, in front of, behind, and next to.

Present:

Student will create a map and a list of clues to locate a hidden object in the classroom.

Going Forward:

Students will translate the use of directional clues into a graphic and positional map for the school

Present and Going Forward Vocabulary:

Map key, direction words, right, left, forward, symbol

Career Connections:

Computer programmer, Architect, Engineer, Translator

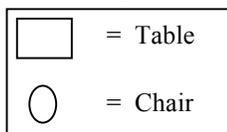
Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)**Treasure Map***Student Instructions:*

1. Hide something in the classroom.
2. On drawing paper, draw a map of the classroom using shapes to stand for objects. (These shapes that stand for something else are called symbols.)

Example: A square can be a symbol for a desk, a rectangle can be a symbol for a table, and a circle can be a symbol for a chair.

3. Make a map key. A map key tells the reader what the symbols stand for. (See National Geographic Education Interactive Site below.)

Example:



4. On your own writing paper, make a list of clues a person could use to find the treasure.
5. Use shape words and direction words (under, beside, next to, above, below, in front of, and behind).
6. Share your map with classmates to see if the treasure can be found using your map key and clues.
7. If students cannot find the “treasure,” evaluate why this happened. Then make improvements to your map.
8. Answer these questions about your map:
 - A. How many moves did I make to get to the location of the “treasure”?
 - B. Could I have used a shorter route? If so, what would that route look like?

Literature Connections/Resources:

- Stevens, Janet & Crummel, Susan Stevens. *And the Dish Ran Away with the Spoon*. San Diego: Harcourt, Inc. 2001.
- Murphy, Stuart. *Treasure Map*. NY: MathStart, HarperCollins. 2004.
- <http://nlvm.usu.edu/en/nav/vlibrary.htm>
- Illuminations (Turtle Pond) at: <http://illuminations.nctm.org/ActivityDetail.aspx?ID=83>
- National Library of Virtual Manipulatives: Ladybug Mazes
http://nlvm.usu.edu/en/nav/frames_asid_141_g_1_t_4.html?open=activities&from=search.html
- National Library of Virtual Manipulatives: Turtle Geometry
http://nlvm.usu.edu/en/nav/frames_asid_178_g_4_t_3.html?open=activities&from=topic_t_3.html
- National Geographic Education Interactive Site: Adventure Island
<http://education.nationalgeographic.com/education/multimedia/interactive/maps-tools-adventure-island/kd/?ar=3>

ALCCRS: K.18 Correctly name shapes regardless of their orientations or overall size.		
Mastered: Students can correctly name shapes regardless of their orientations or overall size.	Present: Students will create a scribble art drawing illustrating many different shapes and identify them by color coding.	Going Forward: Students will use Tangrams shapes to construct figures and connect the figures by composing a story about them.
Present and Going Forward Vocabulary: Continuous, angular, color key, embedded		

Career Connections: Artist, Interior Designer, Art Therapist
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Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)

Hidden Shapes
Student Instructions:

1. Make a scribble drawing by putting your marker down and making a continuous curved or angular line to cover the page.

Example Scribble Drawing

2. Choose a color for each shape you see. Color all of same shapes the same color.
Example: triangles are red, quadrilaterals are blue, pentagons are yellow...
3. Make a Color Key to show your color code for each shape.
Example Color Key

<p>Color Key Triangle=Red Circle=Blue</p>
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4. Display the drawing in the classroom.

Alternative “Hidden Shapes” method
Student Instructions:

1. Using the dot grid provided, connect any three dots with straight lines to form a triangle. Continue connecting the dots to make triangles until your paper is covered with triangles. Triangles may overlap.
2. Color all of the same shapes the same color.
Example: Triangles are red, quadrilaterals are blue, pentagons are yellow...
3. Complete the Color Key to show your color code.

Example

<p>Color Key Triangle=Red Circle=Blue</p>
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OR

Using precut shapes or Tangrams, have students create a series of pictures and connect them with a story.

Materials needed:

1. Drawing paper
2. Markers
3. Crayons
4. Precut shapes
5. Tangrams (Optional)

Literature Connections/Resources:

- Burns, Marilyn. The Greedy Triangle. NY: Scholastic Inc. 1994.
- Gowler-Greene, Rhonda. When a Line Bends...A Shape Begins. London: Sand Piper Publishing. 2001.
- LoZoo. Squiggles! A Drawing Book. Japan: Gakken, LLC. 2004.
- Illuminations: (grades 6-8) Counting Embedded Figures
Teacher link: www.paintcutpaste.com/scribble-drawing
- Tangram Pieces for Going Forward Activity:
http://nlvm.usu.edu/en/nav/frames_asid_112_g_2_t_4.html?open=activities&from=grade_g_2.html

ALCCRS: K.19

Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).

Mastered:

Students can identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).

Present:

Students will create a two-dimensional or a three-dimensional model.

Going Forward:

Students will compose and decompose faces of solids.

Present and Going Forward Vocabulary:

Net, model, face, compose, decompose

Career Connections:

Carpenter, Builder, Architect, Industrial Designer

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

Making Geometry Nets*Student Instructions:*

1. Choose a cardboard box and carefully tear the edges so that the box opens out flat. You have changed a three-dimensional figure into a two-dimensional one. The flat shape you created is an example of a geometric net.
2. Go to <http://www.sadlier-oxford.com/math/enrichment/gr4/EN0411b/EN0411b.htm> for an explanation and a model of a geometric net. Then play the game.
3. Choose one of the following:

Flat to Solid

Choose a box or block.

Trace each face on paper.

Cut out the shapes drawn.

Tape the shapes together to create a net cover for the box or block used.

Try it out by wrapping the net around the box or block.

Is there another way to tape the shapes together to make a different three-dimensional model or net?

Make as many different nets as you can.

Solid to Flat

Use a three-dimensional box such as a cereal box. Cut its faces apart.

Connect the faces like a puzzle to make a net that can be folded to match the shape and size of the original box.

Is there another way to tape the shapes together to make a different net?

4. Make as many different nets as you can. Draw how each flat net looks.

Materials needed:

- Three-dimensional cardboard shapes that have been flattened to two-dimensional
- In-tact cardboard boxes such as cereal boxes
- Tape
- Drawing paper
- Blocks or boxes to trace
- Display of two- and three-dimensional shapes

Literature Connections/Resources:

- Illuminations: Cube Nets: <http://illuminations.nctm.org/lessons/buildbox/box-as-intro.pdf>
- Explanation and illustration of geometric nets and game: <http://www.sadlier-oxford.com/math/enrichment/gr4/EN0411b/EN0411b.htm>

ALCCRS: K.20

Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices or “corners”), and other attributes (e.g., having sides of equal length).

Mastered:

Students can analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts, and other attributes.

Present:

Student will construct faces of structures.

Going Forward:

Students will compose faces into a total building structure.

Present and Going Forward Vocabulary:

Faces, whole, angles, sides, construct

Career Connections:

Builder, Industrial Designer, Civil Engineer, Architect

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

SCENARIO: You have been hired as an architect to design a series of different houses to make up a new subdivision.

Student Instructions: Build models of different houses using playdough and straws.

1. Make each side or “face” of the house by putting together the straws in 2-dimensional (flat) geometric shapes. Join the straws together with balls of playdough or clay.

Example: If you wanted to make a square house, you would need to make 4 square faces, each the same size, and then connect them with clay or playdough balls to make a cube. In order to make the roof for the house, into what shapes would you need to form each face?

2. Connect all sides to make the whole house.
Remember that you can make your house out of any shape you choose. Or you can make several rooms for your house from different shapes and fit them together. Be as creative as possible!
3. Make a set of directions for others to build your house. Explain or draw how to make each face and how to put the faces together to make a complete house.

Materials needed: Straws and clay or playdough balls

Literature Connections/Resources:

- Barton, Byron. *Building a House*. NY: Greenwillow Books. 1981.
- National Library of Virtual Manipulatives: <http://nlvm.usu.edu/en/nav/vlibrary.html>

ALCCRS: K.21

Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

Mastered:

Students can model shapes in the world by building shapes from components.

Present:

Students will construct faces of famous buildings before combining the faces to make the building.

Going Forward:

Students will develop a display of buildings and write a descriptive guidebook to highlight the buildings chosen.

Present and Going Forward Vocabulary:

Components, model, faces, angles, construct

Career Connections:

Architect, Builder, Tour Guide, Historian, Restoration Expert

Literature Connections/Resources:

- Morris, Ann. *Houses and Homes*. NY: Greenwillow Books. 1992.
- Gibbons, Gail. *How a House is Built*. NY: Holiday House. 1996.
- National Library of Virtual Manipulatives-Space Blocker: <http://nlvm.usu.edu/en/nav/search.html>

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

1. Look for pictures of different kinds of buildings.
2. Use building materials to construct the faces of each one. Put the component “faces” together to make a model of the buildings.
3. Design a tour guide by drawing each building you made and tell where the building is located.

Materials needed:

- Pictures or photographs of buildings
- Building materials: Straws and chenille strips cut into approximately 3 inch strips or playdough balls

ALCCRS: K.22

Compose simple shapes to form larger shapes.

Example: “Can you join these two triangles with full sides touching to make a rectangle?”

Mastered:

Students can compose single shapes to form larger shapes.

Present:

Student will compose simple shapes to make compound shapes.

Going Forward:

Students will use combination shapes as basic shapes.

Present and Going Forward Vocabulary:

Combination, pieces

Career Connections:

Architect, Builder, Tour Guide, Historian, Restoration Expert

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

Student Instructions:

1. Use two or more shape “pieces” to make larger shapes that look like objects in our world.
2. Glue the new shapes to paper in such a way that they tell a story.
3. Share the story with your classmates.

Materials needed:

- Paper shape cutouts or templates to trace shapes for cut-out
- Glue

Literature Connections/Resources:

- Tompert, Ann. Grandfather Tang’s Story. NY: Crown Publishing. 1997.
- National Library of Virtual Manipulatives- Pattern Blocks:
<http://nlvm.usu.edu/en/nav/search.html>
- National Library of Virtual Manipulatives-Tangrams:
http://nlvm.usu.edu/en/nav/frames_asid_112_g_2_t_4.html?open=activities&from=grade_g_2.html
- National Library of Virtual Manipulatives-Congruent Triangles:
http://nlvm.usu.edu/en/nav/category_g_2_t_3.html