KINDERGARTEN
Number and Number Sense

Build and Compare

Reporting Category	Number and Number Sense
Topic	Comparing set size using one-to-one correspondence
Primary SOL	K.1 The student, given two sets containing 10 or fewer concrete items, identify and describe one set as having more, fewer, or the same number of members as the other set, using the concept of one-to- one correspondence.
Related SOL	K.2, K.4a

Materials
- Deck of cards (with face cards removed)
- Linking cubes

Vocabulary
number words, *more*, *less*, *same*, *bigger*, *smaller*, *equal*

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Share number cards 1 to 10 with students. Ask them to tell something about each number shown. Using 10 as an example, students might count the number of fingers they have, share that $10 is a lot of money, or point out that 10 is a number bigger than six. Try a few different numbers to get students talking and sharing what they know about each number.
2. Have two students hold up different number cards and compare their numbers. Ask, "Which is more/less? How do you know?"
3. Teach students the game of "Build and Compare." Shuffle a deck of cards (face cards removed) and deal the cards evenly between the two players (facedown in two piles). Players say in unison, "1, 2, 3, compare," as each turns over the top card.
4. Each player states his or her number. "I have a _____" and "I have a ____." Then the players call out, "Build it!" and use linking cubes to build a tower to represent their numbers. After the towers are built, the two players compare their towers and their numbers using *more*, *less*, and *same* vocabulary. For example, "six is more than four" and "four is less than six." The two number cards are then put into the used pile and another set is drawn. The game ends when all the cards have been compared. Shuffle and play again!

Assessment
- **Questions:**
  - Tell me a number that is bigger than____.
  - Which is bigger? How do you know?
  - What do you notice about the two towers?

Variations
- Play with number cards or 10-frame cards instead of regular playing cards.
- Play with numbers 1 to 5 only.
- Play with numbers 11 to 20.

How Many Snails?

Reporting Category	Number and Number Sense
Topic	Identify and describe sets as having more, fewer, or the same
Primary SOL	K.1 The student, given two sets, each containing 10 or fewer concrete objects, will identify and describe one set as having more, fewer, or the same number of members as the other set, using the concept of one-to-one correspondence.
Related SOL	K.2, K.5, K.6, K.12, K.17, 1.3

Materials
- Book about snails (optional)
- Art materials (paper, markers, crayons, or paint)

Vocabulary
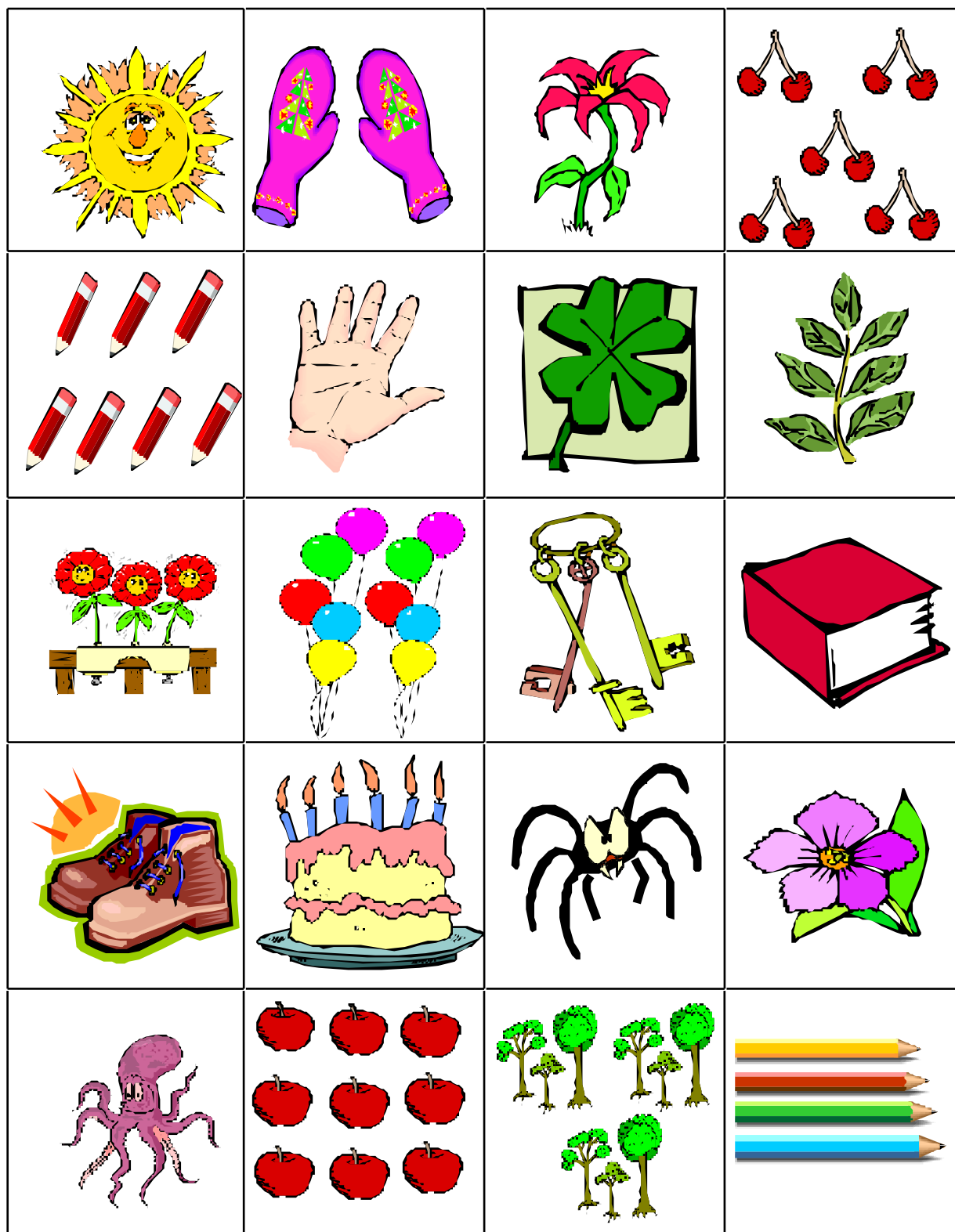*more*, *less*, *same*, *how many*, *count*, attribute words (e.g., *color*, *design*, *size*)

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
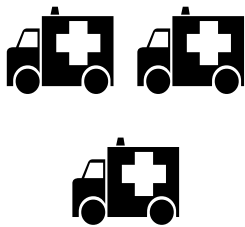5. Read a book about snails to the class. The book provides many opportunities for counting sets and subsets on every page. Encourage students to take turns counting and discussing their counting strategies as the book is read.
6. Ask students to compare one group to another group on the page: "Are there more, fewer, or the same number in the two groups?"
7. Given appropriate art supplies, have each student draw a picture of a balloon. Tell the students that they should try to make their balloon unique.
8. Make a display with all the balloon pictures. (This could be done on a bulletin board or on chart paper.)
9. Allow students to develop questions about the number of balloons that other students can answer. (e.g., How many balloons are red? How many balloons are striped? Are there more round balloons or long balloons?)

Variations
- Students' pictures can be related to a theme or season (e.g., snowmen in the winter, flowers in spring).
- Students' drawings can be sorted and/or placed to create a physical graph based on given attributes.
- Students can take turns sorting the pictures and having other students guess what attribute was used for sorting.

Number Boards

Reporting Category   Number and Number Sense
Topic   Count, write, and select numerals to 15
Primary SOL   K.2   The student, given a set containing 15 or fewer concrete objects, will
   a) tell how many are in the set by counting the number of objects orally;
   b) write the numeral to tell how many are in the set; and
   c) select the corresponding numeral from a given set of numerals.
Related SOL   K.7, K.13

Materials
- One number board
- Two sets of digit cards for each pair or group

Vocabulary
Varies, depending on clues given
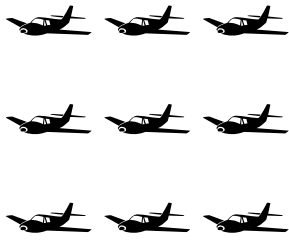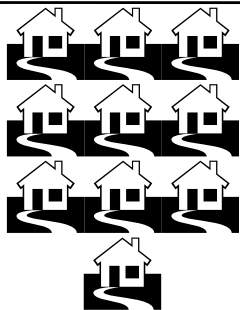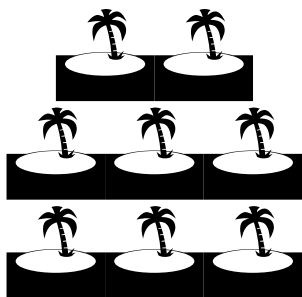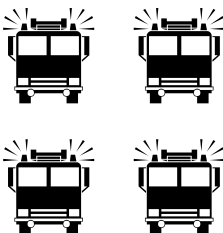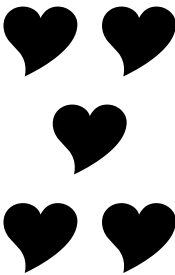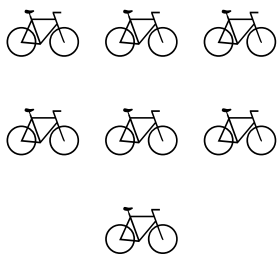
Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
1. Direct students to work with a partner to cover the spaces on a number board, based on clues given by the teacher. Each number board has two representations for the numbers from 1 to 15. After providing a clue, have each student choose the appropriate number card and cover a corresponding space on the number board.
2. Representations for the numbers on the number boards may vary so as to give students experience with thinking about the numbers in a variety of forms. You may create different number boards as needed.
3. Clues for the numbers will vary depending on the students' needs and your goals. One number can be left uncovered for a quick check of accuracy at the end of the activity. "Which number is not covered on your board?"
4. Examples of clues:
   • Cover the number that is one more than 4.
   • Cover the number of pennies equal to one nickel.
   • Cover the number that comes right before 6.
   • Cover the number of legs that a puppy has.

(Note: You should develop additional clues as appropriate. Clues may include a variety of concepts or concentrate on a specific skill.)
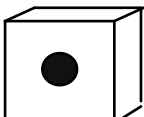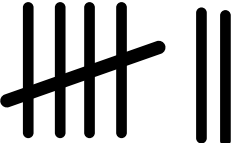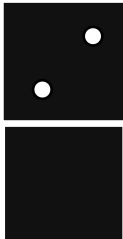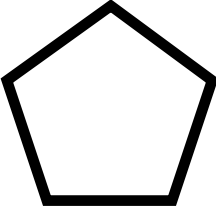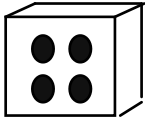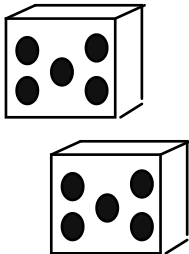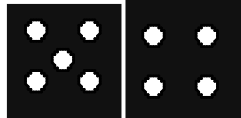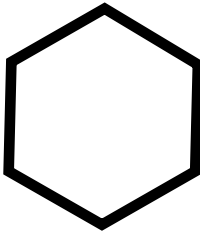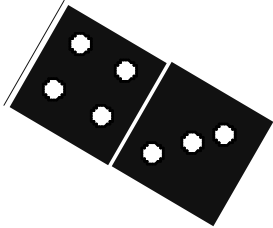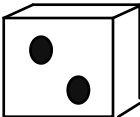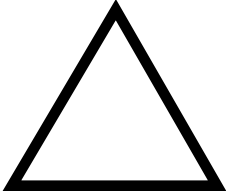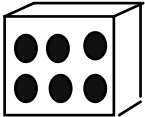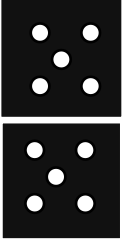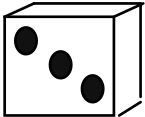
Number Board 1

Number Board 2

2	✈✈✈ ✈✈✈ ✈✈✈	🏠🏠🏠 🏠🏠🏠 🏠🏠🏠 🏠	**3**
5	🌴🌴 🌴🌴🌴 🌴🌴🌴	🚑🚑 🚑	8
🚒🚒 🚒🚒	9	1	👁 👁
🚢	6	🎁🎁 🎁🎁 🎁🎁	❤❤ ❤ ❤❤
4	🚲🚲🚲 🚲🚲🚲 🚲	10	7

Number Board 3

Digit Cards (copy and cut apart)

1	2	3	4
5	6	7	8
9	10	1	2
3	4	5	6

7	8	9	10
11	12	13	14
15	16	17	18
19	20	11	12

13	14	15	16
17	18	19	20

Garbage!

Reporting Category	Number and Number Sense
Topic	Count, write, and select the number of objects in a set
Primary SOL	K.2 The student, given a set containing 15 or fewer concrete objects, will

      a) tell how many are in the set by counting the number of objects orally;

      b) write the numeral to tell how many are in the set; and

      c) select the corresponding numeral from a given set of numerals.

**Related SOL**   K.4a, 1.2, 1.1a

Materials
- Large deck of cards for display
- Regular decks of cards with face cards removed (one deck per partner set, or small groups of three) or decks made from 10-frame cards (attached)

Vocabulary
more than, less than, greater than, before, after, counting on, counting back

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
1. Place cards 1 to 10 randomly on the floor. Have students share numbers they recognize and can name. Ask, "Are the cards in order?" Have students share ideas about the order of numbers 1 to 10.
2. Teach students the game "Garbage." Shuffle a deck of cards with the Jack, Queen, King, and Jokers removed. Deal 10 cards facedown to each player. Place extra cards in the draw pile. Players arrange their cards (facedown) in a 10-frame pattern as shown below.
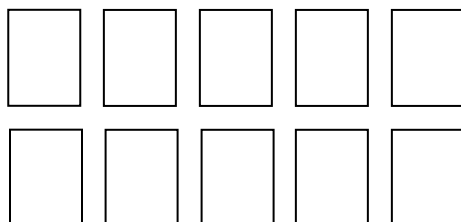
3. The first player takes a card from the draw pile and looks at it. The player names the card and then places it in the proper place by counting. For example, "I have a 6 and it goes in the 1, 2, 3, 4, 5, 6 space." The 6 is placed face up and the card underneath is revealed.
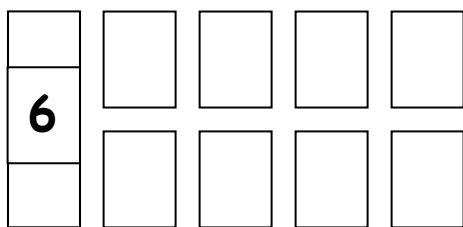
4. The card revealed under the 6 is then named, and the player tries to explain where it goes in relation to the first card (i.e., the 6). For example, if the uncovered card is a 10, the student might say, "10 is more than 6," and count on from 6 to get to 10. Or, the player may have to start back at 1 to count all the way to the 10's space. Once the appropriate space is determined, that card is placed face up and the card beneath it is revealed. With each play, the student tries to articulate how the two numbers relate to one another in order to place the new card.
5. Play continues until a card is revealed that has already been played. If the player uncovers a card that has already been placed (face up), he or she calls, "Garbage!" and puts that card into a pile next to the draw pile.
6. Player Two begins the same way, by drawing from the draw pile. Or, the player may use the top card in the "garbage" pile to start play.
7. Each time "Garbage!" is called, play transfers to the next player. The object of the game is for the players to reveal and order their cards from 1 to 10. The game is over when the first player achieves that objective.
8. You should observe and listen for students to use *counting on*, *counting back*, *before,* and *after*, as well as other strategies to describe the placement of each number.
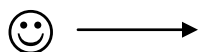
Assessment
- **Questions**
    - How did you know where the ___ went?
    - Which numbers are you missing?
    - Is there another way you know that the number goes in that space?
    - What do you know about these two numbers: ___ and ___?
    - Can you tell me where ___ goes? Is it before or after ___? How do you know?
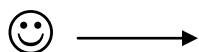
Variations
- Use 10-frame cards (attached) instead of regular playing cards. You will need three sets of 1 to 10 for each partnership.
- Play with numbers 1 to 5, slowly adding numbers to the game as the first five are mastered.
- Play with teen numbers (up to 20), ordinal numbers, fractions, and/or decimal numbers.
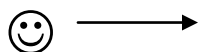
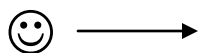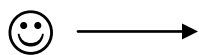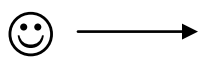# 10-Frame Cards
(copy and cut out three sets per pair)

☺ ⟶

●	●	●	●	●
●	●	●	●	

☺ ⟶

●	●	●	●	●
●	●	●	●	●

How Many?

Reporting Category   Number and Number Sense
Topic   Count, write, and select the number of objects in a set
Primary SOL   K.2   The student, given a set containing 15 or fewer concrete
                                                  objects, will
                                               a)   tell how many are in the set by counting the number of
                                                      objects orally;
                                               b)   write the numeral to tell how many are in the set; and
                                               c)   select the corresponding numeral from a given set of
                                                      numerals.
Related SOL   K.4a, K.6, K.12, K.15, 1.5

Materials
- Overhead projector
- Magnetic counters
- Magnet wand
- Bingo supplies

Vocabulary
count, *total*, *more*

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
This activity helps develop fluency with composing and decomposing numbers, meaning that a
whole number can be broken down into multiple addends. Decomposition of numbers is
necessary to support a rich place value concept and a sound basis for mental computation.

1. Place 6 to 10 counters randomly on the overhead projector. Have the students
   determine the total number of counters shown and describe their counting strategies.
2. Turn the projector off and use the magnet wand to pick up some of the counters.
   (Students should not see how many counters are on the wand.)
3. Turn on the projector. Have students identify the number of counters showing.
4. Ask students, "How many counters are on the wand? How do you know?"
5. Replace the counters from the wand and repeat, picking up a different number of
   counters with the magnet wand each time.

Assessment
- **Questions**
  - What is the missing part of (target number)? How do you know?
  - Is there another way to make (target number)?
  - Can you think of all the combinations to make (target number)?
  - How can you be sure you have made all the combinations?

Variations
- Larger numbers of counters can be used (up to 20).
- Counters can be arranged spatially (e.g., in rows of two or groups of three).
- Number sentences (symbols) can be introduced for recording purposes.

Quick Images

Reporting Category   Number and Number Sense
Topic   Count, write, and select the number of objects in a set
Primary SOL   K.2   The student, given a set containing 15 or fewer concrete
                                                objects, will
                                                a)   tell how many are in the set by counting the number of
                                                       objects orally;
                                                b)   write the numeral to tell how many are in the set; and
                                                c)   select the corresponding numeral from a given set of
                                                       numerals.
Related SOL   K.1, K.5, K.6, K.12, K.17, 1.3, 1.8

Materials
   - 10-frames, or dot cards

Vocabulary
   more, *fewer*, *less*, *above*, *below*, *beside*, *group*, *set*

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
   1.   Present the students with a dot card, or 10-frame, for approximately 5 seconds.
   2.   Ask students to report the total number of dots, and describe how they got that answer.
   3.   Encourage students to share different strategies. For example, when presented with a
        10-frame that has eight dots, some students may see it as five and three more, while
        others may see two fewer than 10. An arrangement of five dots, such as those seen on a
        dot cube, might be seen as two groups of two dots plus one more, or a group of three
        above another group of two.
   4.   Repeat this activity frequently with a variety of numbers and spatial arrangements.

Note: Creating and using specially patterned arrangements to represent numbers encourages
students to create mental images that are important for developing fluency in composing and
decomposing numbers with automaticity. The 10-frame model is especially useful for
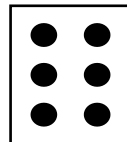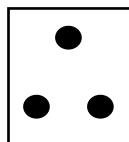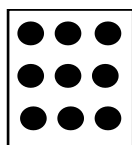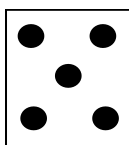developing ideas about the benchmark numbers of 5 and 10.

Variations
   - Dominoes, playing cards, and standard number cubes all have representations of
     common spatial arrangements for numbers. Multiple experiences with each of these
     help develop student understanding.

10-Frame Examples
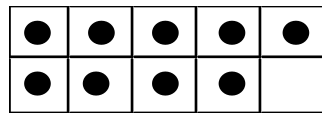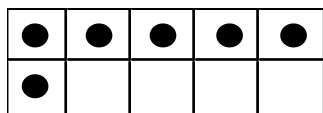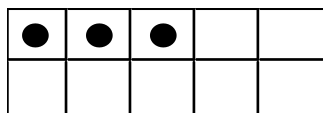
Dot Card Examples

Spill the Beans

Reporting Category	Number and Number Sense
Topic	Count, write, and select the number of objects in a set
Primary SOL	K.2 The student, given a set containing 15 or fewer concrete objects, will

        a) tell how many are in the set by counting the number of objects orally;

        b) write the numeral to tell how many are in the set; and

        c) select the corresponding numeral from a given set of numerals.

Related SOL	K.4a, 1.1

Materials
- Raw lima beans painted on one side and left white on the other (or two-color counters)
- Plastic cups
- Recording sheets
- Crayons

Vocabulary
  and, *plus*, *equal*, *make*, and other addition words

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
1. Show students the beans. Count out five together. Ask, "What might happen if you spill the five on the floor? How might they land? What are the possibilities?" Let students share their ideas.
2. Shake five and spill them. Ask, "How did they land? How many colored? How many white? How many in all? What if we spilled them again, how might they land? Will it be the same?" Let the students share their ideas.
3. Shake the beans, spill them, and talk about how they land.
4. Teach students how to play "Spill the Beans." Students will use between five and nine beans. Count out the beans and place in a cup. Students say, "Shake, shake, shake, and spill," while shaking the cup and spilling the beans on the table. Have students separate the beans by colors and record how many of each by coloring a row on the recording sheet. (You may want to give specific directions for coloring, e.g., color all the colored counters first and then leave the rest white.) Repeat again and again until the students feel they have found all possible combinations.
5. Come back together as a class and talk about how students might know that they found all of the different combinations.
6. List all the combinations on the board and talk about the patterns that can be seen. Ask, "What happens to the number of colored beans as the number of white beans increases? Why is this so?"

Assessment
- **Questions:**
  - What are some ways you can make ____?
  - What goes with _____ to make _____?
  - Is there another way to make ____?
  - How will you know when you have all the combinations of ____?

Variations
- Try other numbers or sets of beans.
- Record numbers along with pictures of beans.
- Add symbols or number sentences to be completed, such as __ + __ = __.
- Have students cut the recording sheet apart by rows to organize their results and discuss the resulting patterns.

Recording Sheet (example for seven beans)

Splash!

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Topic	Count, write, and select the number of objects in a set
Primary SOL	K.2 The student, given a set containing 15 or fewer concrete objects, will

a) tell how many are in the set by counting the number of objects orally;
b) write the numeral to tell how many are in the set; and
c) select the corresponding numeral from a given set of numerals.

Related SOL K.1, K.3, K.4a, K.6, K.12, K.15, 1.5

Materials
- Story book about splashing in water
- Counters
- Story mats

Vocabulary
first, second, third, more, less, same

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
1. Read the book about splashing to the class.
2. Provide each student with a story and some counters.
3. As you read the story, have students use the counters to model the characters' movements in and out of the pond.
4. Pause frequently to ask how many animals are in the pond and how many are out.
5. Have students compare the number of animals that are in the pond to the number of animals that are out of the pond. Ask, "Are there more, less, or the same number? How do you know?"
6. Ask students to identify the animals that went in the pond first, second, and third.
7. Create new "splash" stories for the students to act out and describe.

Variations
- Number sentences can be written to record the events in the story.
- Students can use the counters and mats to model and describe additional scenarios.

Story Mat
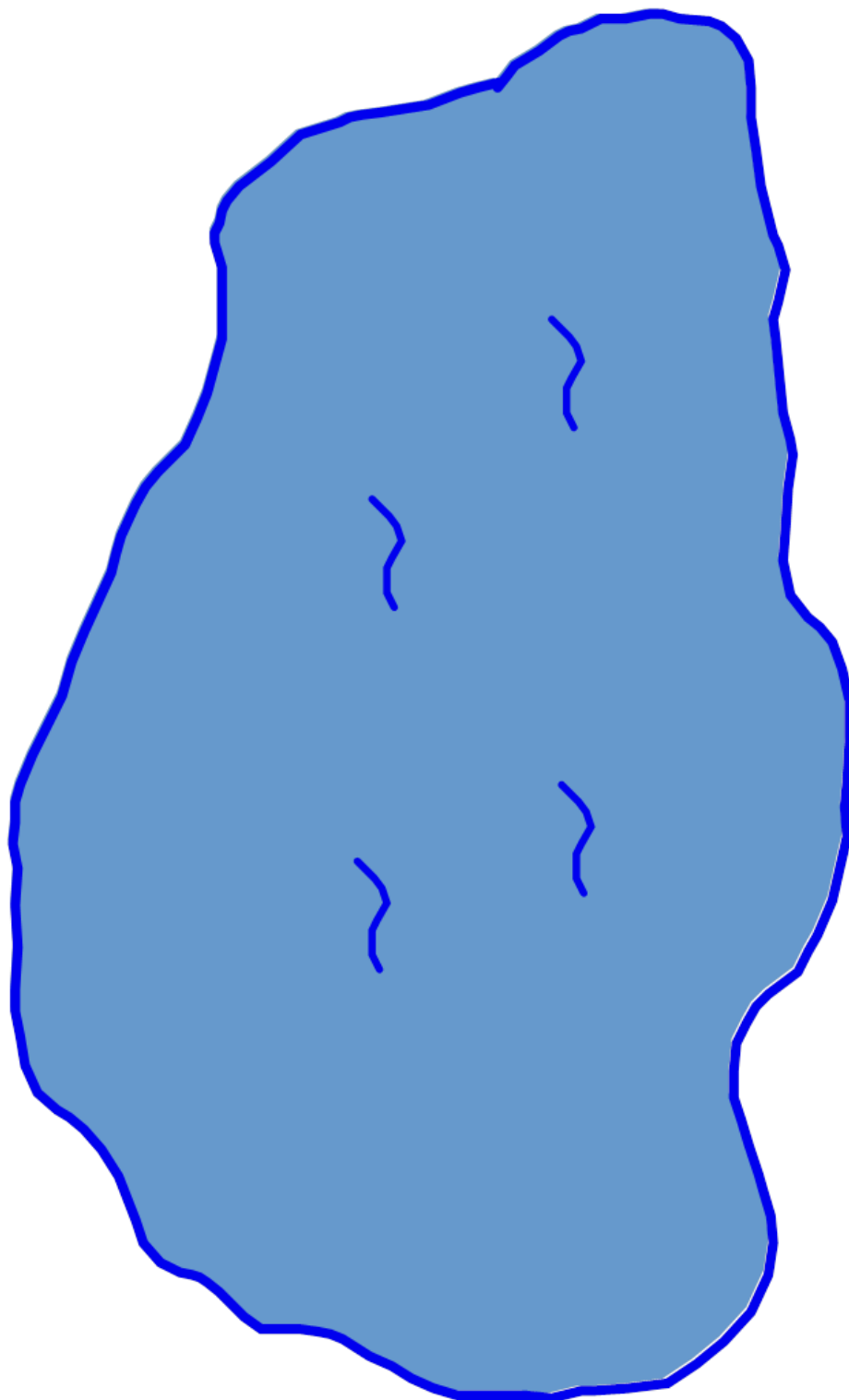
Counters

(copy and cut out one set for each student)
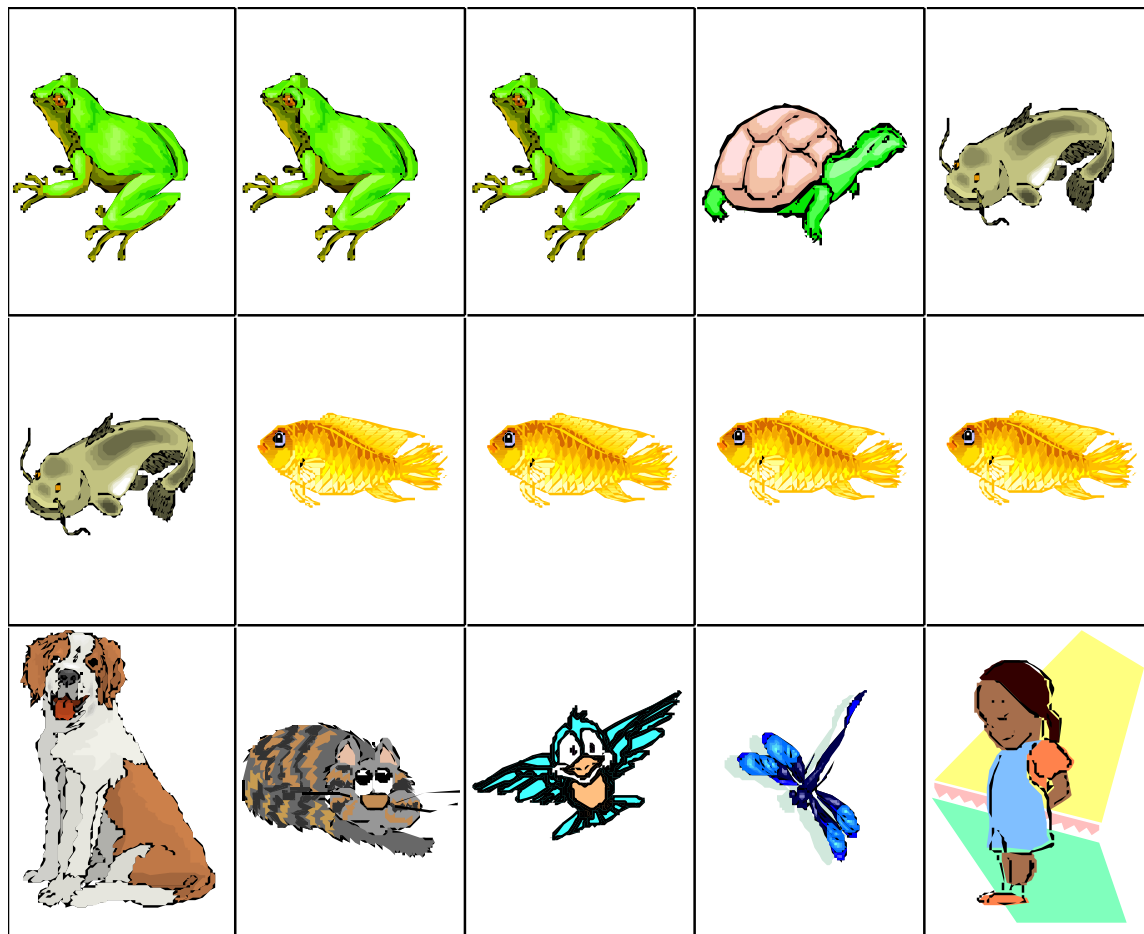
Paper Chains

Reporting Category	Number and Number Sense
Topic	Indicate ordinal position of an object
Primary SOL	K.3 The student, given an ordered set of ten objects and/or pictures, will indicate the ordinal position of each object, first through tenth, and the ordered position of each object.

Materials
- Book about *Henry the Fourth*
- 1-inch strips of construction paper (pre-cut and in different colors)
- Glue

Vocabulary
ordinal number words (first, second, etc.), *top*, *bottom*, *left*, *right*, *place*, *position*, *line*, *loop*

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
1. Read a book, about *Henry the Fourth*.
2. Discuss the story and the ordinal number words in the story. Ask: "How many dogs come before Henry? How do you know? If there were five dogs, what would be the last dog's position? If there were three more dogs what would be the position of the last dog in the show?"
3. Give each student 10 1-inch strips of different colored construction paper.
4. Have each student make a paper chain with 10 paper strips in the same color order. (Before the lesson, you should predetermine the order of the different colors for the paper chain.)
5. Demonstrate how to glue the two ends of the first paper strip together in a loop. Have students get the second color they are supposed to use and put it through the first loop and then glue the two ends together. The loops should be intertwined to form a chain. Continue this process with students until their chain has 10 paper loops.
6. Working with a partner or in a small group, have students take turns asking questions about the chains. For example, "What color is third if the chain is facing the door? What color is seventh? In which place is the blue loop? The green loop?
7. Have students turn their chains in another direction, and continue asking each other questions about the ordinal positions of the colored loops.

Assessment
- **Questions:**
  - In which place is the (color) loop?
  - How about the (color) loop? How do you know?
  - Which color is first, fifth, tenth?
  - How many loops come before yellow (or another color)?

Variation

- Have students make a five-loop paper chain using two colors of construction paper strips. They should arrange their strips in an AB, AAB, etc., pattern. Challenge students to determine which color would come seventh if the pattern continued? Tenth? Ask them to explain their thinking.

Lily Pad Hop!

Reporting Category   Number and Number Sense
Topic   Counting forward and backward
Primary SOL   K.4   The student will
        a)   count forward to 100 and backward from 10.
Related SOL   K.1, K.2, 1.3

Materials:
- Game board
- Number cube
- Markers/counters
- Green construction paper circles for lily pads
- Children's storybook on leap frogs (optional)

Vocabulary
counting, *number words*, *dots* or *pips*

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
1. Ask students to share some things they know about frogs. What do they do? Read students the story book, if available. The story should have in it a variety of animals. The frog gets around by jumping or hopping.
2. Have students pretend they are frogs and hop. Ask, "How can we tell how far the frog has gone?" (Answer: "We can count his hops.") Have students call out a number and hop that many times, getting their whole bodies involved in counting.
3. Lay out the green circles as lily pads. Have students hop and count how many lily pads they land on. Each time a student frog lands, talk about counting hops. The other students can use their hands and hop on their legs to get the feel of hopping and counting together, practicing one-to-one correspondence.
4. Teach students to play "Lily Pad Hop." Each set of partners or small group needs a game board, a number cube, and markers/counters. For each turn, the player rolls the number cube, names the number rolled, and then moves one of the markers/counters across the board. The object is to get all of the frogs to the pond or lily pad. If a frog gets to the pond and the player still has hops remaining, the student can move another frog toward the pond. In other words, players can split their hops between two frogs if needed. The game is over when all of the frogs get to their ponds.

Assessment
- **Questions**
  - How many more spaces do you have to get to the lily pad, or to the end? How do you know?
  - Are you halfway there? How do you know?
  - Do hops and number names stay together?

Variations:
- Play with regular six-sided dot cube with pips (small dots).
- Play continuously by letting the frogs start over each time they reach the pond.

Lily Pad Hop! Game Board
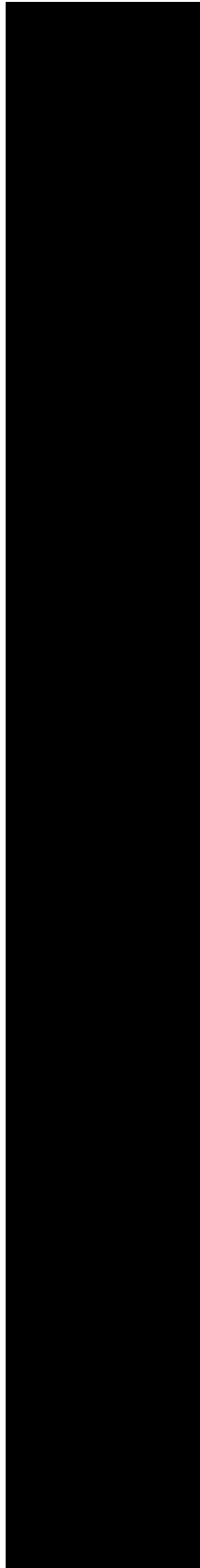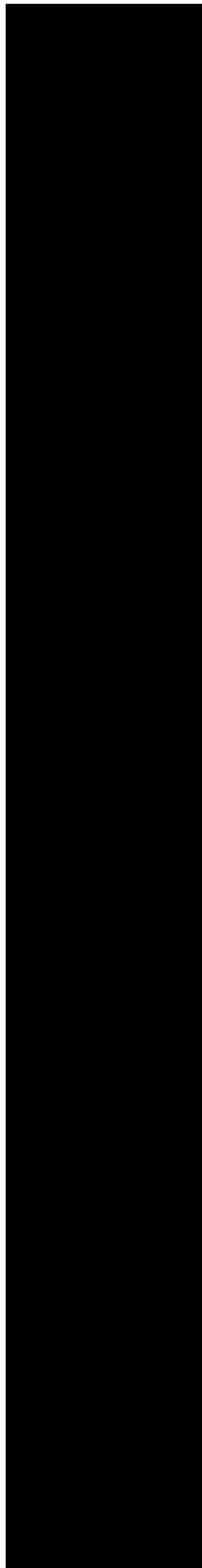
Math to 100 and Back: More or Less

Reporting Category	Number and Number Sense
Topic	Counting by ones, fives, and tens and backwards from ten
Primary SOL	K.4 The student will

  a)   count forward to 100 and backward from 10;
  b)   identify one more than a number and one less than a number;
       and
  c)   count by fives and tens to 100.

Materials
- Hundreds board
- Linking cubes

Vocabulary
count, ones, fives, tens, one more than, one less than, skip counting, patterns

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
1. Have students use the Hundreds Board to count by ones to 100. They will place their finger on each number as they count. Have students count beginning with any number while placing their finger on that number (e.g., 11) Then have students move their finger to the number that is one more (e.g., 11,12). Have students use the vocabulary of "one more than "11 is 12."
2. Have students place a linking cube on the number 10. Students will move the linking cube backwards while counting (10..9..8..7..6..5..4..3..2..1). Use the vocabulary of "one less than a number" as they move to the left by counts of one.
3. Students can place their finger (or use a linking cube) on 7 and count back one stating "6 is one less than 7." You may have students continue counting back from any number to model "one less than."
4. Beginning with the number 5, students will skip count by 5s marking the multiples of 5s with a linking cube.
5. Beginning with the number 10, students will skip count by 10s marking the multiples of 10s with a linking cube.

Assessment
- **Questions**
    - "What are some numbers that come before 50? What are some numbers that come after 50? How do you know?"
    - "Can you model counting by 5s?"
    - "Can you model counting by 10s?"
    - "How many brownies would you like? Why?"

Hundreds Board

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

Sharing

Reporting Category	Number and Number Sense
Topic	Identify halves and fourths
Primary SOL	K.5 The student will identify the parts of a set and/or region that represent fractions for halves and fourths.

Materials
- Oranges, cookies, brownie, or candy bar pieces
- Chart paper for recording
- Pencil

Vocabulary
equal, *fair shares*, *parts*, *whole*, *total*, *fraction*

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
1. Introduce the activity by dividing the orange, cookie, brownie, or candy bar into different sized parts so the students can see. Pose the question, "If I give everyone a piece of the _____, will this be an equal way of sharing the _____? Why or why not? How could the _____ be shared equally?" Have students brainstorm and discuss their ideas. (Students should realize that the parts are not equal-sized and thus not an equal way of sharing.)
2. Divide a second orange, cookie, brownie, or candy bar into equal shares using one of the student's strategies for division, and let the students enjoy the treat while you begin the next part of the activity.
3. Next, explain to the students that they will be working with a partner or in a small group to solve the following problem: *There are two children who want to share one orange so that each child gets the same amount. Show how many orange pieces each child can have. Explain your thinking using pictures, numbers, and words.*
4. Discuss the problem with students. Ask, "What are we trying to figure out? How many children are sharing? How many oranges are they sharing? What are some ways we could show our work on this problem?"
5. Set the small groups to work and remind students that they need to draw pictures to show how many parts one child will get if they share the orange equally.
6. Allow students to work on the problem and then explain their thinking.
7. Monitor students as they work to see how they are approaching the problem. What strategies are they using? Are they sharing the oranges equally among the children in the problem? Do their pictures accurately represent equal parts? What difficulties are they having? What are students doing well? How are they recording to show how many orange pieces one child will get?
8. After students have had time to explore the problem, pull the whole class back together to discuss the strategies students used to determine how many orange pieces each child would get if sharing the orange equally. Ask, "How did you solve the problem? How

many orange pieces did the children have to share? Did you use the whole orange without throwing any of it away? Did the children get equal parts? How do you know? Is there another way to solve this problem? How did you record your thinking? What numbers did you use to show how much one child will get? Does anyone know what the pieces/parts are called?"

9. Record various students' solutions on chart paper or the board during the whole class discussion. Be sure to discuss the various strategies students used to solve the problem.

Assessment

- **Questions**
    o What are we trying to determine with the oranges?
    o How many children are sharing?
    o How many oranges are they sharing?
    o What are some ways you could show your work on this problem?
    o How did you solve the problem?
    o Did you use the whole orange(s) without throwing any parts away?
    o Did each of the children get an equal part? How do you know?
    o Is there another way to solve this problem?
    o Did anyone have a different picture for your solution?
    o How did you record your thinking?
    o What numbers did you use to show how much one child will get?
    o Does anyone know what the pieces/parts are called?

Variations:

- There are four children who want to share two oranges so that each gets the same amount. Show how many orange pieces one child will get. Explain your thinking using pictures, numbers, and words.
- Use different numbers based on the needs of students.
- Try using numbers that involve each child receiving a whole orange and part of another orange (e.g., four children could be sharing six oranges) to observe strategies students use to solve the problems and share the oranges equally.