



Kindergarten

NUMBER SENSE

Routines

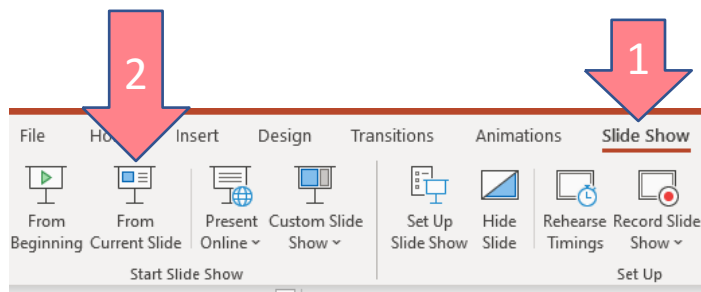
Days 101-120



HOW TO RUN POWERPOINT IN SLIDE SHOW MODE:

Slides with animation features, must run in Slide Show mode of PowerPoint for the animations to work correctly.

1. Select <Slide Show> from the menu at the top
2. Select <From Current Slide>



HOW TO ANNOTATE STUDENT THINKING ON THE SLIDE:

- With the slide in Slide Show mode, right click on the slide
- Select <Pointer Options> then choose <Pen>

How to facilitate Quick Count

Quick Count is an instructional routine designed to build on students' natural ability to subitize (recognize the quantity of objects in sets of 1-5 without counting the objects one-by-one). This routine will help students become more aware and purposeful when subitizing and to apply subitizing skills when finding the total quantity of larger sets.

This routine follows a developmental progression with slight changes in the routine after several of the same type are presented.

Step-by-step directions are provided on each slide. Typically, a Number Sense Routine is one slide per day. A Quick Count routine is a single routine like all the other routines but contains more than one slide as part of that day's routine.

The Quick Count progression of skills is listed below:

- 5 subitizing routines
- 3 comparative quantities routines
- 6 composite subitizing routines that ask students to create an equation
- 6 teen number routines with a group of 10 ones and some additional ones

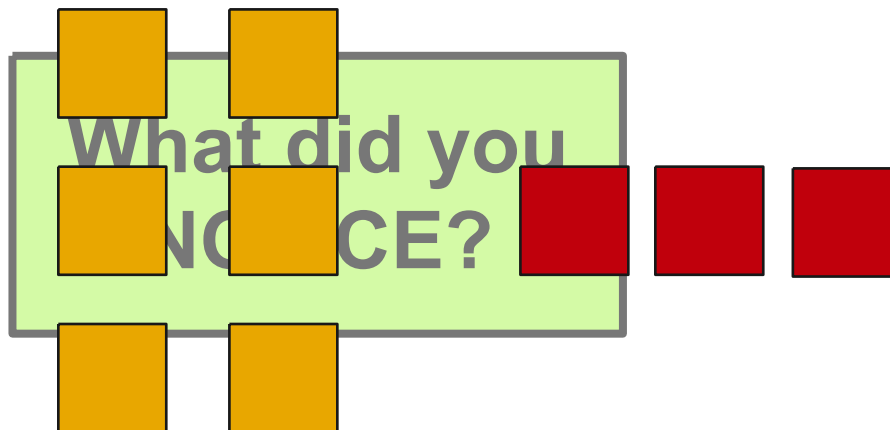


Quick Count

SAY: I am going to show you an image. The image will appear for only three seconds, so pay close attention and try to remember what you saw.

****CLICK ONCE to begin the automated reveal process.*

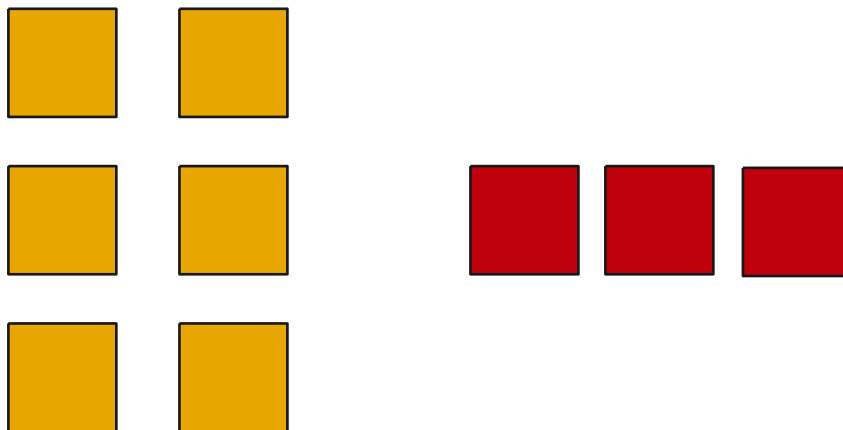
Allow several students to share their observations – do not correct inaccurate observations – the image will be shown again. After students share ideas, CLICK to continue.



Quick Count

SAY: We talked about what you remembered after the image disappeared, this time the image will not disappear.
 SAY: Let's look at the image closely and talk about your ideas for an equation that we could use to represent this image. [Allow several students to share their ideas – annotate their ideas in the white space]
 CLICK to reveal a possible equation

ASK: What does the 6 represent? What does the 3 represent? What does the 9 represent?



$$\begin{array}{r} 6 \\ \hline \end{array} + \begin{array}{r} 3 \\ \hline \end{array} = \begin{array}{r} 9 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \hline \end{array} + \begin{array}{r} 6 \\ \hline \end{array} = \begin{array}{r} 9 \\ \hline \end{array}$$



Quick Count

How to facilitate *Clue by Clue*

During this routine, students are shown a group of objects. Then they are given clues about the object's attributes that helps them to narrow the possibilities down to just one possible object from the group.

To facilitate this routine,

1. Show the group of objects to your students.
2. Tell students that you are thinking of ONE of these objects and you will give them clues to help them discover which object you are secretly thinking about.
3. Reveal the first clue. Ask students to think about which objects could be your mystery object. Which objects cannot be the mystery object. Discuss.
4. Use the annotation tool to visually mark off objects that do not fit the clue. In Slide Show mode, right click to annotate on the slide. Select >Pointer Options>Pen. Cross off images as students determine it does not fit the clue. The answer is revealed after Clue 3 is shown.



Clue by Clue

ASK: Can you use the clues to guess which family I am describing?

FACILITATION NOTE: Use the annotation tool to mark off pictures that do not fit the clue.



Clue 1

My family has
less than
5 people

Clue 2

My family has
more than
2 people

Clue 3

$2 + 2$
can be used
to represent
my family



Clue by Clue

How to facilitate *More or Less*

For this routine, students will determine which of the images shows “more” or “less” or if the two images show “equal” values.

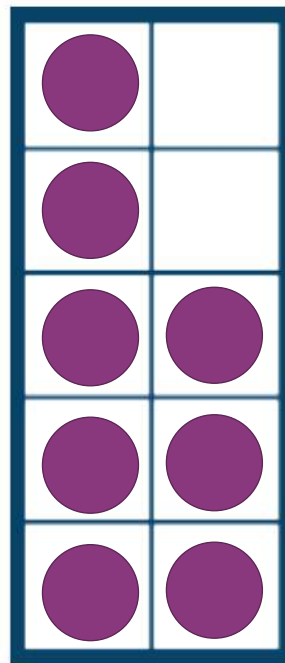
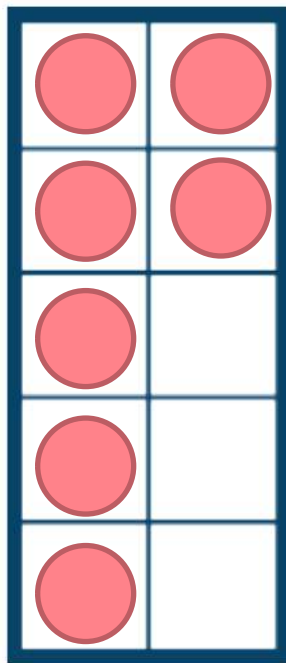
To facilitate this routine,

1. Show the two images.
2. Ask the question shown on the slide.
3. Allow students to discuss their ideas with a partner first (this gives them time to gather their ideas and allows all students an opportunity to talk).
4. Ask a few students to share their ideas with the whole group.



More or Less

ASK: Which 10-Frame has fewer counters? How do you know?



More or Less

How to facilitate *Same But Different*

At the start of this routine, students are shown two images. They are asked to identify not only the attributes that are the SAME between the two objects, but also the attributes that are different. This routine helps build students' grayscale thinking where things do not have to be all one or the other, they can be both at the same time.

To facilitate this routine,

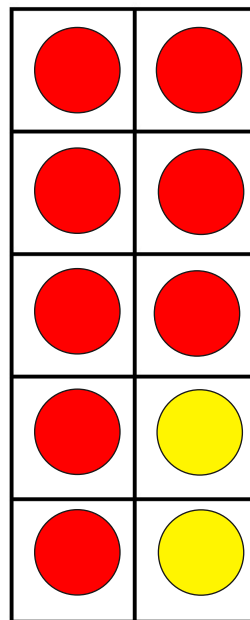
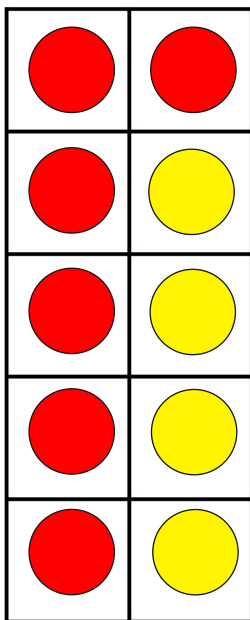
1. Ask your students to think about what is the same about the two objects AND what is different. If scaffolding is needed, you can ask them to first think about how the objects are the same. Discuss. Then ask how the objects are different. Discuss.
2. Ideally, students will state how they are same and different in one sentence: For example, when shown a hula hoop and dinner plate, the student may respond, "They are both round but one is a toy, and the other is a dish."



Same But Different

ASK: How are these two images the SAME but DIFFERENT?

FOCUS: The focus is on decomposing ten in various ways and recognizing that it still has a total of ten.



Same But Different

How to facilitate *GeoChat*

This routine is designed to build students understanding of various geometric concepts and the specialized vocabulary required to talk about geometric shapes.

To facilitate this routine,

1. Show the image on the slide
2. Ask the question shown on the slide.
3. Allow students to discuss their ideas with a partner first (this gives them time to gather their ideas and allows all students an opportunity to talk).
4. Ask a few students to share their ideas with the whole group.
The focus of these number sense routines is for STUDENTS to do most of the talking as they make sense of the math. Encourage students to develop their mathematical vocabulary in a way that allows them to talk about their mathematical ideas with others.
5. Prompt students to also answer the question “How do you know?”

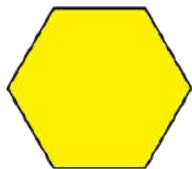


GeoChat

SAY: The black trapezoid was made using three blocks.

ASK: Which three blocks were needed to make this trapezoid?

FOCUS: The focus is primarily the use of geometric vocabulary. Allow students to discuss and play with the geometric ideas. Do not rush the ideas or become impatient with the process. The power is in the discussion, not the specific solution.



hexagon



triangle



tan rhombus



trapezoid



blue rhombus



square



How to facilitate *Number Strings*

This routine includes a set of related math problems designed to teach strategies based on number relationships. To facilitate this routine,

1. Show the visual prompt. Ask the prompt question. Ask students to use the discreet signal system that has been established as a classroom Number Sense Routine norm – i.e., a thumbs up in front of their chests when they have an answer in mind.
2. When most students have signaled that they are ready, call on students to share their strategies. Decide if you are going to model the strategy shared. The goal is to find efficient ways to solve the problem accurately.
3. Advance the slide to progressively include additional problems within the number string.
4. If a number string's purpose is a certain strategy to be developed and that strategy is not emerging from students, then you may need to ask questions that encourage students to consider the strategy that is intended to be developed.
5. Throughout the routine, encourage students to actively listen to each other's ideas, ask their classmates clarifying questions, and connect their own strategies to the other strategies that have been offered. Be patient and persistent – these skills will take time to develop.



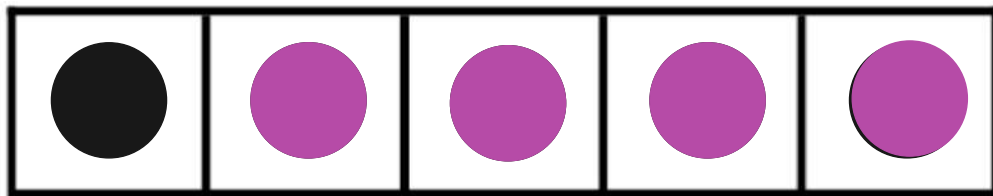
Number Strings

FOCUS STRATEGY: Using the Five/Ten Structure

There are five images with today's routine. Advance the slide to see each one.

Allow students to share strategies before advancing to the next slide within this routine.

ASK: How many? How did you see it?



I have 3. I wish I had 5.
How many more do I need?

I have 1. I wish I had 5.
How many more do I need?

Number Strings

How to facilitate Math Talks

This routine is designed to elicit multiple strategies and provide opportunities for students to reason about numerical relationships and make mathematical connections.

To facilitate this routine,

1. Show the image. Pose the problem by reading the prompt given on the slide.
2. Ask students to use the discreet signal system that has been established as a classroom Number Sense Routine norm – i.e., a thumbs up in front of their chests when they have an answer in mind.
3. When most students have signaled that they are ready, call on students to share their strategies as you annotate the answers they provided.
4. It is important to remain neutral as students respond; avoid indicating whether the student is correct or incorrect at this point in the discussion.
5. Encourage students to actively listen to each other's ideas, ask their classmates clarifying questions, and connect their own strategies to the other strategies that have been offered. Be patient and persistent – these skills will take time to develop.



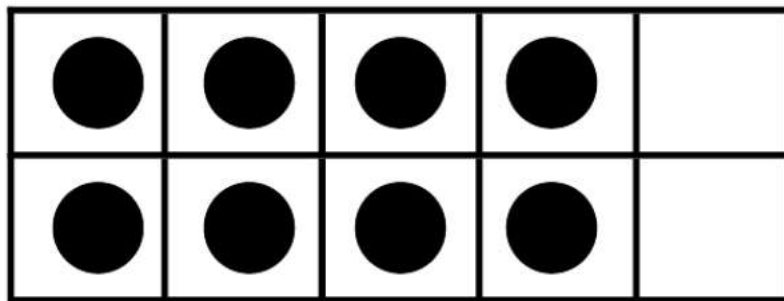
Math Talks

FOCUS: Eight

ASK: How many dots?

ASK: How did you count them?

CLICK for additional frames to annotate student ideas.



Math Talks

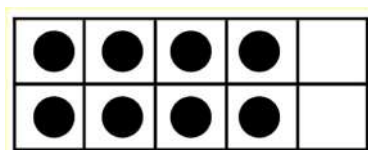
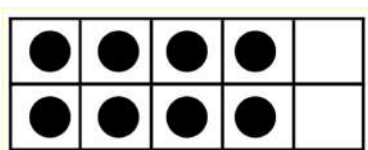
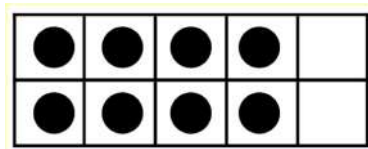
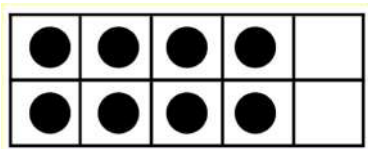
ANNOTATION: Record student thinking with the pen or with gestures. Include written equations if appropriate.

SOME OF THE POSSIBLE STRATEGIES:

- Counting On – students may have seen four dots and counted on four, five, six, seven, eight
- Count All – students may have counted the eight dots one-by-one
- Use the Five/Ten Structure – students may have seen two dots were missing and ten minus two is eight
- Doubles – students may have seen four and four

ASK/DISCUSS: Were any of the strategies we talked about today similar?

ASK/DISCUSS: Which strategy do you think was most efficient for counting THESE dots? Why?



Math Talks

How to facilitate *Splat!*

This routine is designed to help students use strategies to count quantities efficiently, build addition and subtraction fluency within 10, and develop an understanding of the relationship between addition and subtraction facts.

To facilitate this routine,

1. Follow the prompts provided with each animation.
2. Students will be shown a set of dots. They will be asked how many dots are on the slide. Ask a few students, “How many dots do you see?”
3. Then ask students to explain how they counted the set of dots. As students explain their strategy (one-by-one counting, grouping, counting by 2s, etc.), annotate student thinking by writing on the slide or through simple gestures.
4. As the animation continues, a Splat! will cover some of the dots. Ask students to determine how many dots are hiding under the Splat! The student explanation of how they know is the most important part of this routine. Listen and celebrate the various efficient strategies that students share.



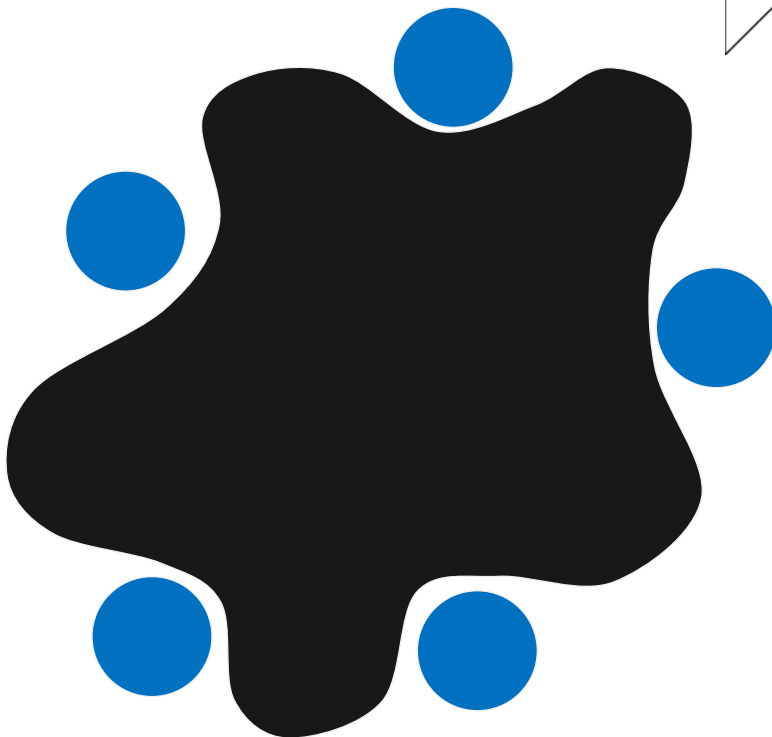
Splat!

DIRECTIONS: Click to view animations. Read each prompt as you go through the routine.
Remember to use gestures to annotate student thinking. Allow multiple students to share ideas.

10

How many blue

What can we learn
from this picture?



Splat!



How to facilitate *Rapid Naming*

This routine is designed as a building block to arithmetic fluency. Research indicates that a student's ability to "rapid name" correlates to the student's skill in both reading and mathematical fluency.

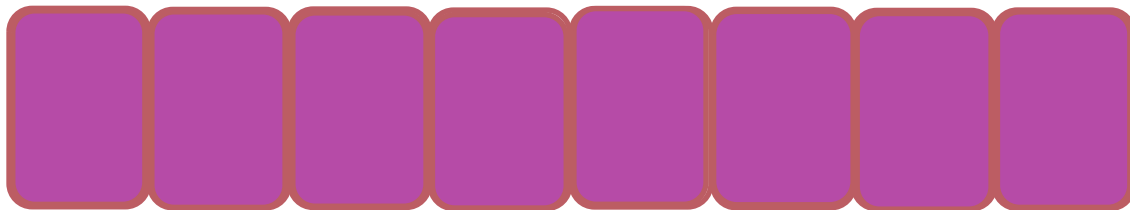
To facilitate this routine,

1. Tell students to focus very carefully on the images that will appear on the screen.
2. Say, "As the images appear, say the name of the image out loud. We will be calling out the name of each item together. Try to name the image right when it appears."
3. Monitor students' ability to rapid name the images.



Rapid Naming

SAY: Stay very focused to the board. The little doors will open to reveal a number representation.
We're going to see if we can say each of the values before the next door opens. It's fast, so stay alert! Ready?
****CLICK ONCE to begin the automated reveal process.*



HOORAY!



Rapid Naming

FOCUS: Eight

SAY: These beads are “in play”. These beads are “at rest”.

ASK: How many beads are “in play”?

ASK: How did you count them?

CLICK for additional frames to annotate student ideas.



“in play”

“at rest”



Math Talks

ANNOTATION: Record student thinking with the pen or with gestures. Include written equations if appropriate.
SOME OF THE POSSIBLE STRATEGIES:

- Counting On – students may have seen five beads and counted on five, six, seven, eight
- Count All – students may have counted the eight beads one-by-one
- Use the Five/Ten Structure – students may have looked at the ten red beads and noticed two red beads were not used and ten minus two is eight
- Doubles Plus – students may have seen three and three and then counted on the remaining two beads

ASK/DISCUSS: Were any of the strategies we talked about today similar?

ASK/DISCUSS: Which strategy do you think was most efficient for counting THESE beads? Why?

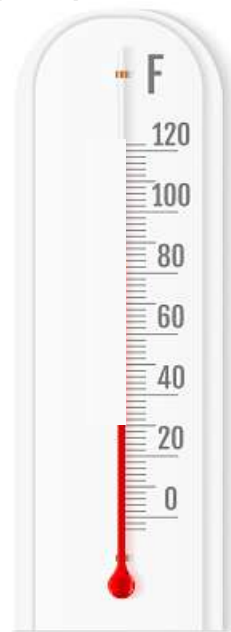
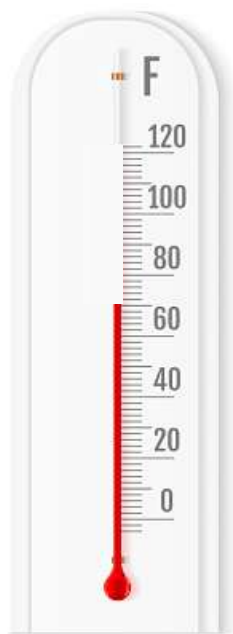


Math Talks

SAY: These are thermometers. They measure the temperature of the air, so we know how hot or cold it is outside. When we know the temperature, we know which clothes will be best to wear that day. When the temperature gets **colder**, the red line in the thermometer goes **down** and is lower on the thermometer.

ASK: Which thermometer shows a colder temperature? How do you know? [discuss]

ASK: Which thermometer shows a hotter temperature? How do you know? [discuss]



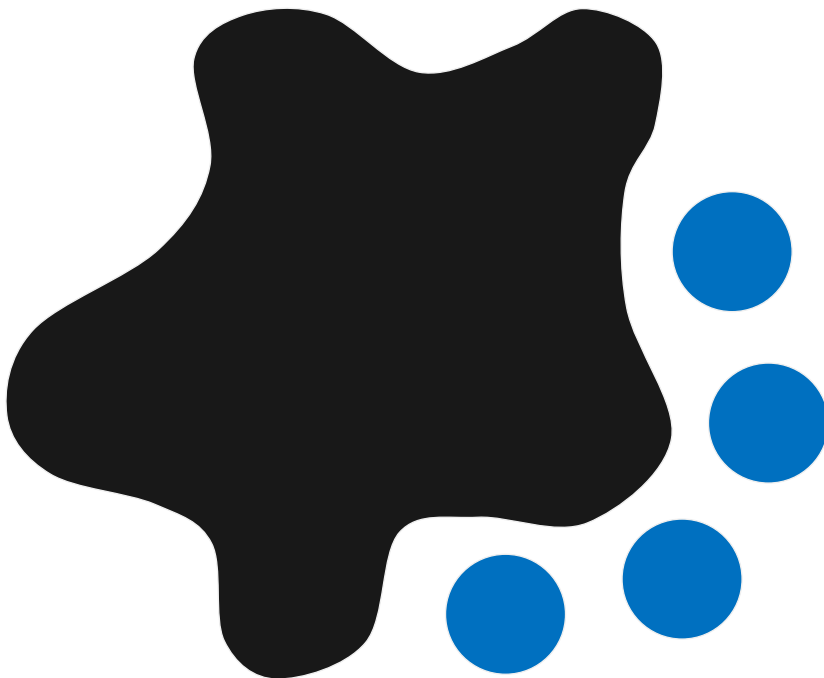
More or Less

DIRECTIONS: Click to view animations. Read each prompt as you go through the routine.
Remember to use gestures to annotate student thinking. Allow multiple students to share ideas.

10

How many blue

What can we learn
from this picture?

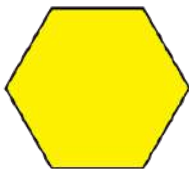


Splat!

SAY: Two blocks were used to make this new shape (the black shape below).

ASK: Which TWO shapes could be used to make the new shape?

FOCUS: The focus is primarily the use of geometric vocabulary. Allow students to discuss and play with the geometric ideas. Do not rush the ideas or become impatient with the process. The power is in the discussion, not the specific solution.



hexagon



triangle



tan rhombus



trapezoid



blue rhombus



square



GeoChat

ASK: We have seven counters. If we want ten counters, should we add more counters or take counters away?

ASK: How many counters do we need to add to make ten? How do you know?

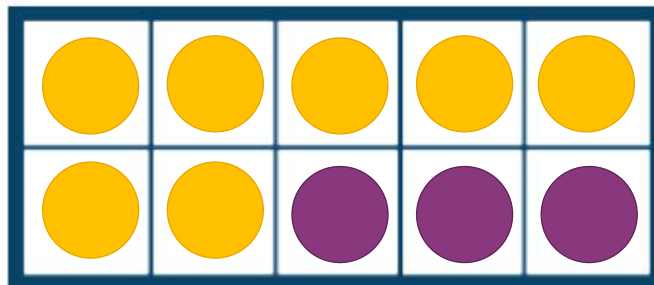
*****CLICK ONCE to begin the automated reveal process**

Counters will be added to the frame. Count aloud as they appear.

ASK: What equation could we use to represent this model?

[Click again for animation of equation to appear]

ASK: How do we know this equation matches the model?



$$7 + 3 = 10$$



More or Less

SAY: Stay very focused to the board. The little doors will open to reveal a number representation.
We're going to see if we can say each of the values before the next door opens. It's fast, so stay alert! Ready?
****CLICK ONCE to begin the automated reveal process.*



HOORAY!



Rapid Naming

FOCUS STRATEGY: Using the Five/Ten Structure

SAY: For today's routine, you will have to pay very close attention to how many beads are "in play" on the Rekenrek (rek-ken-rek). The image will disappear after 3 seconds.

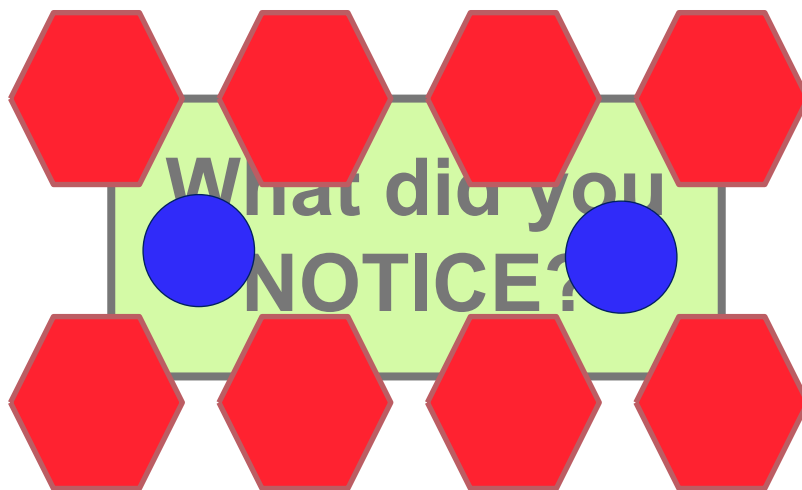
- Click to reveal "Ready Set Go" image
- Click to reveal the Rekenrek image – it will automatically begin to disappear after 3 or 4 seconds
- While the image is hidden, ask several students to tell how many beads were "in play" and how they know
- Click to bring the image back into view. Compare the student descriptions to the image
- Click again to begin the process again with the next image - continue the process through all five images (ABCDE)



Number Strings

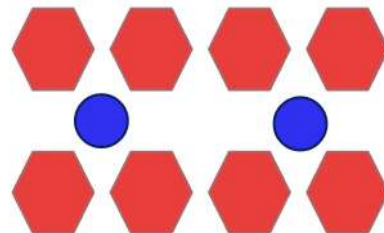
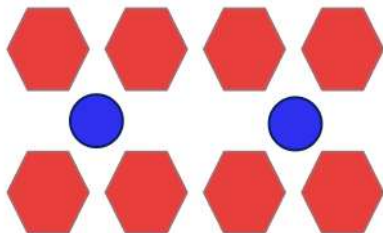
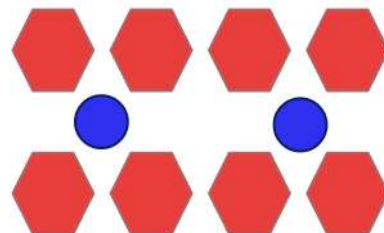
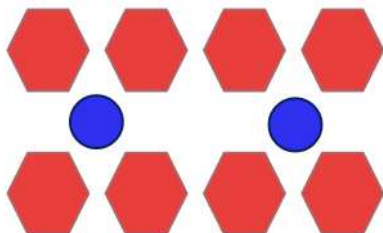
SAY: I am going to show you an image. The image will appear for only three seconds, so pay close attention and try to remember what you saw. ****CLICK ONCE to begin the automated reveal process.*

Allow several students to share – do not correct inaccurate observations – the image will be shown again. After students share ideas, CLICK to continue.



Quick Count

Call on students to share ideas. Gesture and annotate on the slide to model student thinking. You will annotate the ideas of up to four students. Encourage students to compare & evaluate each other's ideas. Look for strategies that are efficient; that are effective shortcuts that mathematicians might use, too. [CLICK] Connect and summarize. Have students name the enduring understandings that will be useful with other problems, too.

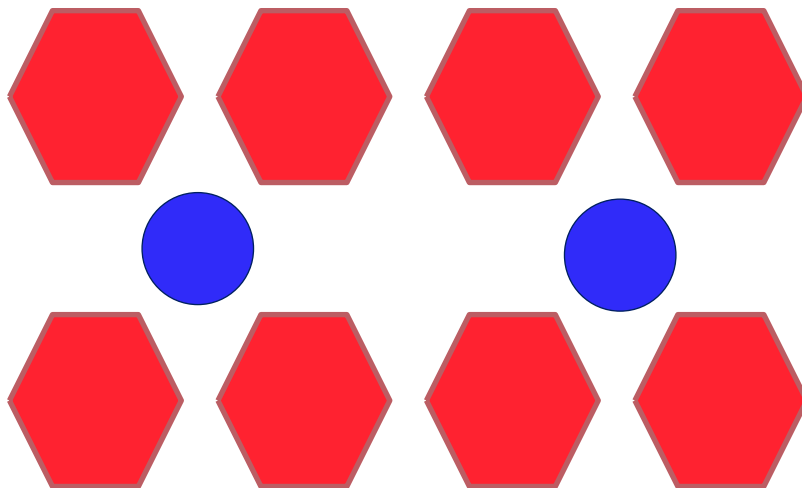


Quick Count

SAY: Now that we have talked about how many of each shape, let's look at a couple of equations that could be used to represent the image.

ASK: What numbers can we put in these blanks to represent this image? [Allow several students to share ideas]
[CLICK to reveal a possible equation. CLICK AGAIN to reveal another option]

ASK: What does the 8 represent? What does the 2 represent? What does the 10 represent?



$$\begin{array}{r} 8 \\ \hline \end{array} + \begin{array}{r} 2 \\ \hline \end{array} = \begin{array}{r} 10 \\ \hline \end{array}$$

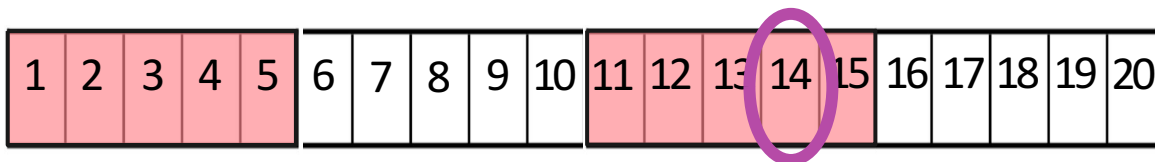
$$\begin{array}{r} 2 \\ \hline \end{array} + \begin{array}{r} 8 \\ \hline \end{array} = \begin{array}{r} 10 \\ \hline \end{array}$$



Quick Count

ASK: Can you use the clues to guess which number I am describing?

FACILITATION NOTE: Use the annotation tool to mark off numbers that do not fit the clue.



Clue 1
I have more
than ten
ones

Clue 2
I am less
than
seventeen

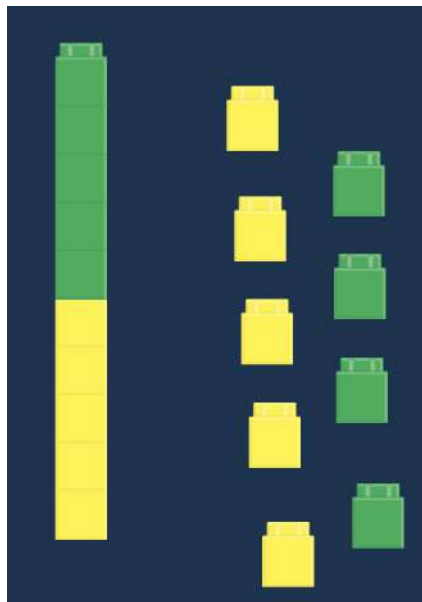
Clue 3
I am made
of ten ones
and four
more ones



Clue by Clue

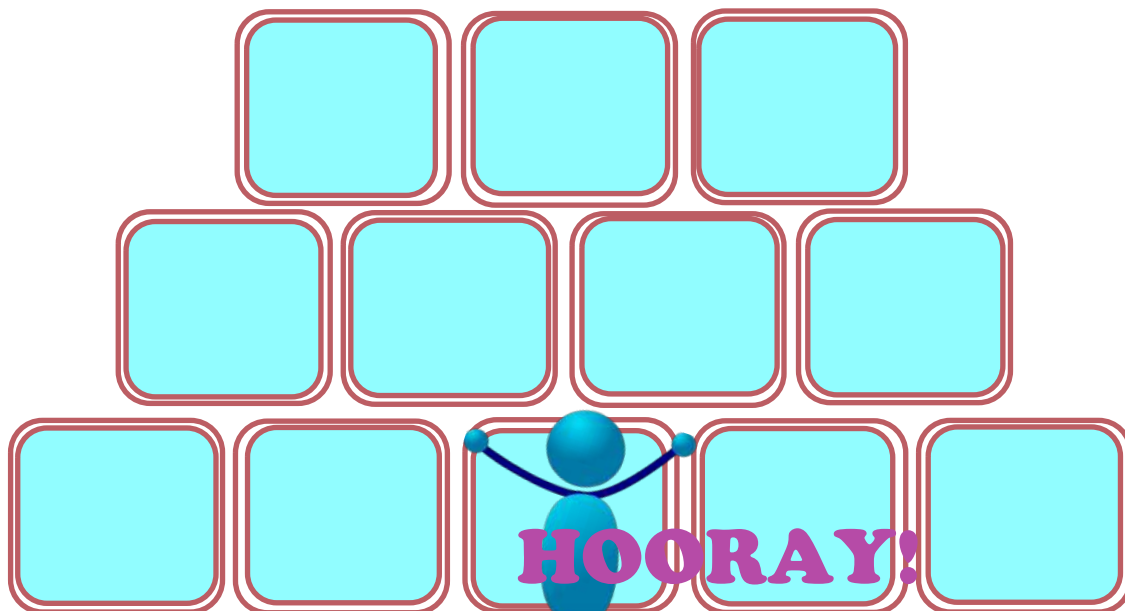
ASK: How are these two images the SAME but DIFFERENT?

FOCUS: The focus is to help students connect the numerical representation of 19 with group of ten ones and 9 more ones.



Same But Different

SAY: Stay very focused to the board. The little doors will open to reveal a number representation.
We're going to see if we can say each of the values before the next door opens. It's fast, so stay alert! Ready?
****CLICK ONCE to begin the automated reveal process.*



Rapid Naming

Many THANKS!

180 Days of Number Sense Routines for Kindergarten

created by the Elementary Mathematics Team
of **Calvert County Public Schools**, Maryland

Want to know more? Reach out to our team

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