180 Days of
Number Sense Routines
Grade 2
Days 61-80

Calvert County Public Schools

180 Days of
Number Sense Routines

WHY IS DEVELOPING NUMBER SENSE IMPORTANT? Number Sense is the foundational building block for all strands of mathematics. Students who struggle in mathematics do not lack mathematical ability, but rather, they simply do not have a strong number sense on which to build their knowledge. Just as we are not born knowing how to read, we are not born with Number Sense. It must be developed and nurtured over time through a progression of understandings about numbers and their relationships to one another. With time and focused practice, students come to understand that numbers are meaningful, and outcomes are sensible and expected. Number Sense development encourages students to think flexibly and promotes confidence with numbers.

WHAT IS A NUMBER SENSE ROUTINE? A routine is an activity or event that occurs on a regular basis over time. Routines provide a framework for our day to support both the teacher and students. Routines help to build community and create a safe learning environment for students. Routines build a sense of belonging, ownership, and predictability which make the classroom a place to take risks. We learn through risk-taking; we take risks when we feel safe; we feel safe in a supportive learning environment; we create supportive learning environments through routines. Just as we have established routines for bus dismissal and fire drills, we must also establish routines that build mathematical thinking and discourse.

180 Days of
Number Sense Routines

HOW WILL THESE NUMBER SENSE ROUTINES BENEFIT ME AND MY STUDENTS? What teachers do and how they do it is critically important and has a profound impact on the quality of the educational experience of our students. Effective pedagogy, the art and science of teaching, is a key element in the learning process. The Number Sense are models of effective pedagogy and ensure that the critical Number Sense instruction we provide is equitable to all our students regardless of geography, teacher experience, or student circumstance. As we prepare our students to be mathematically proficient in their lives beyond the classroom walls, these Number Sense routines will help to lay the critical foundation for all future mathematical endeavors.

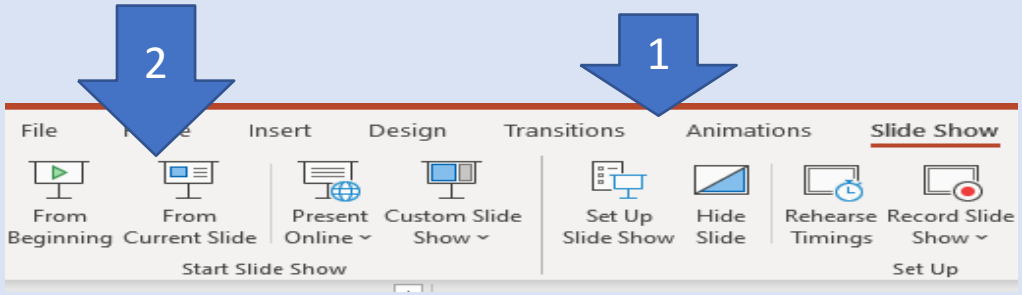
WHAT ARE THE CCPS IMPLEMENTATION EXPECTATIONS? Number sense routines have been developed for all 180 instructional days in grades 1-5. These routines are to be used every day, including early dismissal, late arrival, and field trip days. Because the routines do not require a specific order, it is permissible to trade routines among days to best match the time available. Number Sense must be built over time. With consistency, we can build students' number sense creating a strong mathematical foundation. If students or the teacher is struggling with a routine, it is expected that the teacher collaborate with colleagues to build capacity in that routine – do not just choose to skip the routine. If additional help is needed, the teacher should seek the assistance of their content specialist or mathematics supervisor.

180 Days of
Number Sense Routines

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>

180 Days of
Number Sense Routines

Acknowledgements

We are grateful to those who have inspired this project – and there have been many. These slide decks were designed for Grades 1–5 with custom-built daily routines for each grade level. The nine routines blend original creations, adaptations, and borrowed OER materials. We have made our work available in Open Educational Resources so that others may benefit as we have. Our deepest gratitude and respect to all those who helped move our work forward, and a special thank you goes to the following whose own work had such a tremendous impact on our 180 Days of Number Sense Routines:

- *Decide & Defend* and *Quick Count* routines were adapted from templates created by Grace Kelemanik and Amy Lucenta at http://FosteringMathPractices.com
- *Estimation Clipboard, Esti-Mysteries,* and *Splat!* templates created by www.SteveWyborney.com
- *Same But Different* discussion from Developing Grayscale Thinking by Looney Math Consulting at https://www.samebutdifferentmath.com
- *Which One Doesn't Belong* tasks adapted from http://wodb.ca by Mary Bourassa

Use the NEXT SLIDE with students.

Here is are some possible responses. This list is not all-inclusive. Additional ideas encouraged!

8:40	8:45	8:50	8:55
9:00	9:05	9:10	9:15
9:20	9:25	9:30	9:35
9:40	9:45	9:50	9:55
10:00	10:05	10:10	10:15

PATTERNS:

- Notice column 1 minutes 40, 00, 20, 40, 00, 20
- Notice column 2 minutes 45, 05, 25, 45, 05
- Columns 1 and 3 all end in 0
- Columns 2 and 4 all end in 5
- Each column value increases by 20 minutes from time above it
- Each column value decreases by 20 minutes from time below it
- After :55 minute mark, the hour changes to the next number
- **PREDICT: What number would go BELOW 10:15** (without calculating – use the patterns)

Day 61

CHORAL COUNTING

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Skip Counting TIME by 5 minutes

Day 61

Let's skip-counting time by 5-minute intervals beginning with 8:40.
What time is 5 minutes later than 8:40?
Watch for PATTERNS that happen as we count.
I will chart the times as we say them together, so let's count slowly.

8:40	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

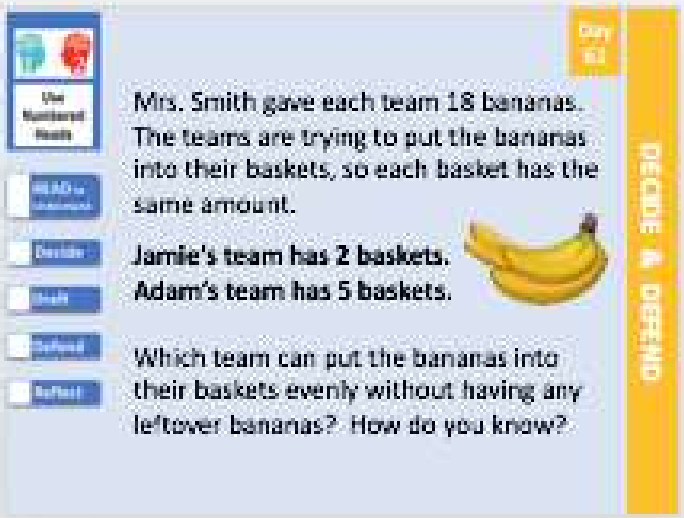
CHORAL COUNTING

Use the NEXT SLIDE with students.

Here is are some possible responses. This list is not all-inclusive.
Additional ideas encouraged!

Day 62

DECIDE & DEFEND



Students will use a variety strategies to determine this.
Encourage students to consider that BOTH MAY be possible (it's not).
Listen as students talk with partners.
As you listen, select students to share ideas that will create discussion and thinking.
Remind students that the focus is on developing skill in defending your choice(s), not just knowing the right answer.

Use Numbered Heads

READ to Understand

Decide

Draft

Defend

Reflect

Day 62

DECIDE & DEFEND

Mrs. Smith gave each team 18 bananas. The teams are trying to put the bananas into their baskets, so each basket has the same amount.

Jamie's team has 2 baskets.
Adam's team has 5 baskets.

Which team can put the bananas into their baskets evenly without having any leftover bananas? How do you know?

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Day 62

Reflect on Learning

- A new math idea I learned today is…
- Next time I interpret someone else's work, I will… *(ask myself, pay attention to,…)*
- To convince a skeptic, it's important to ….

DECIDE & DEFEND

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Day 63

Estimation Activity

When you are ready to use this activity,
use the PowerPoint platform so the slides work properly.

PROMPT: How many dice are in the vase?

ESTIMATION

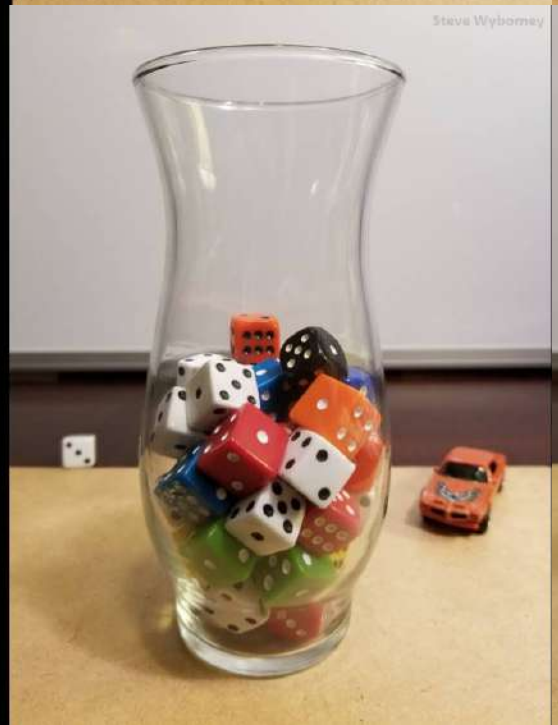
How many dice are being held by the vase?

The Reveal

53 dice

The Reveal

The Reveal



The Reveal

Day 64

7 + 7
6 + 8
8 + 8
7 + 9

TEACHER NOTES

BEFORE

This slide has the String of expressions that you will use for today's Number Talk. You can use Smart Ink, right click for PowerPoint Pen, or convert this slide to Smart Notebook so you can easily annotate on the slide. The annotation is an important part of the routine. The expressions should be presented one-at-a-time with skills building on one another. Remember, students will come with a wide variety of strategies. Allow student sharing of these strategies and work toward determining which of the ways were most efficient and brain-friendly.

DURING

Doubles/Near-Doubles

The following number talks use doubles and encourage students to compensate numbers sets to make doubles

Example: 6+8 is the same as 7+7 because you can take 1 from the 8 and give it to the 6 making the new problem 7+7

Remember, students will come with a variety of strategies. Help students to understand a wide variety and guide them into understanding that some strategies work better in some situations, so knowing more than one way to solve an equation like this one is important so they can later choose the method that is most efficient.

AFTER

After solving the expressions with various strategies, help students to understand how these expressions were all related.

NUMBER TALK

Light the Future
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Day 64

7 + 7

NUMBER TALK

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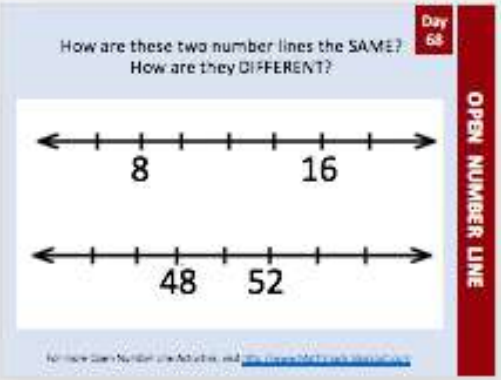
Use the NEXT SLIDE with students.

Here is are some possible responses. This list is not all-inclusive.
Additional ideas encouraged!

Day 65

OPEN NUMBER LINE



Give plenty of think time.
Pose just one of the questions at a time for greater focus: How are these two number lines the SAME?

- They both have intervals of 2 (each hash mark is worth 2)
- They both have even numbers plotted
- They both have 2 numbers written on the number line
- They both have missing numbers
- If we traveled far enough to the left, they would both eventually land on zero

How are these two number lines DIFFERENT?

- They are different parts of the whole number line
- They have different number plotted
- There are 3 missing numbers between the two plotted points on the first graph and only 1 missing value between the two plotted points on the second graph

For more Open Number Line Activities, visit http://www.MathSnack.blogspot.com

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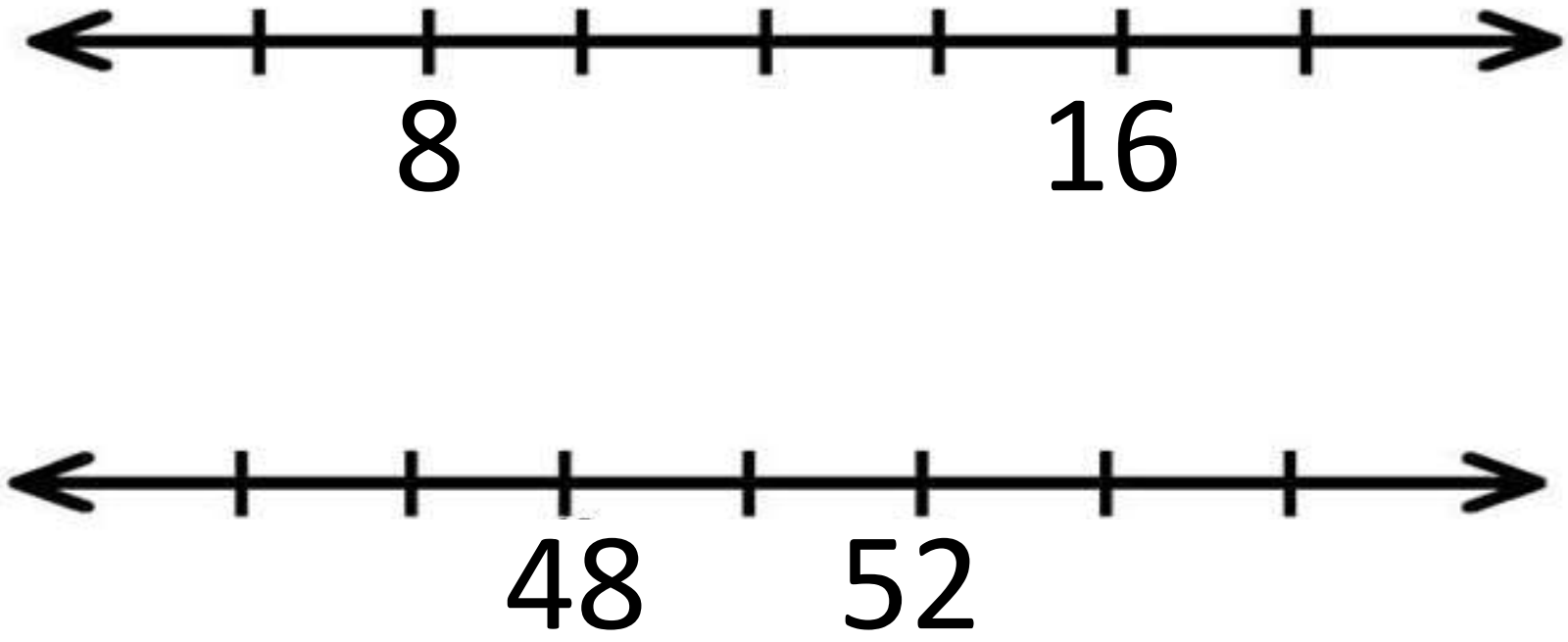
Day 65

How are these two number lines the SAME?
How are they DIFFERENT?



OPEN NUMBER LINE

Directions for QUICK COUNT routines

Quick Count is an instructional routine designed to shift attention away from mindless calculations and toward necessary structural interpretations of mathematics. This routine fosters structural thinking, Math Practice 7, and promotes student discourse.

1. Pair students into Numbered Heads (or Peanut Butter Jelly partners, etc.)
2. Show students the first image slide for about 3-5 seconds depending on the complexity of the image and level/experience of the students.
3. With their partner, students discuss everything they can remember about the image.
4. After a minute of partner discussions, have students share ideas to the group.
5. Create a list of student ideas that students can refer to when the image is shown again.
6. Tell students that you are going to put the slide back up. Ask students to COUNT the images using some type of shortcut strategy (chunking, symmetry, arrays…)
7. Show the image again and leave it displayed as students look for counting shortcuts.
8. With their partner again, students discuss how many objects are in the image and how describe the shortcut counting strategy they used. Give time for partner discussions. Walk around and take notes about discussions to determine which students will share.
9. Use the slide with identical images as a comparative visual as students take turns explaining how they counted the objects in the image.
    - Use your notes to select different students with different approaches.
    - The student explains his/her shortcut as the teacher **gestures** over the image.
    - A **different student** is asked to **REPEAT the original student's shortcut** as the teacher **annotates** (circles, underlines) on the image to show the shortcut used.
    - Repeat the process using different student-generated shortcut strategies.
10. End by asking students to explain what was "mathematically important"

Day 66

What do you NOTICE?

http://www.visualpatterns.org

QUICK COUNT

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Day 66

QUICK COUNT

What did you NOTICE?

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Day 66

How many do you see?
What counting shortcut did you use?

QUICK COUNT

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Day 66

QUICK COUNT

(They) noticed ____ so they _____

I noticed ____ so I _____

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Day 66

Reflect

What was mathematically important?

QUICK COUNT

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Intro

SAME BUT DIFFERENT

About the SAME BUT DIFFERENT Routine

Same But Different is a powerful routine for use in math classrooms. The *Same but Different* routine compares two things **calling attention to both how they are the same and how they are different**. This apparent paradox is the beauty of the activity. In this analysis, *instead of making a choice and trying to prove that these are the same or prove that they are different, **students consider how two items can be both**.* This is a critically important distinction from many other tasks.

One of the reasons students struggle in math is that they struggle to make connections. Someone who has poorly developed number sense might see each number as its own thing, and not part of the larger network of mathematical ideas. A mathematical conversation using the language *same but different* that calls attention to how a new concept in math is the same as another familiar and comfortable concept but different in a specific way is a useful conversation in growing a student's network of connections. Building these connections could also reduce anxiety as children become the sense-makers in the conversation.

Source: www.samebutdifferent.net.com/about

Facilitating the SAME BUT DIFFERENT Routine

1. Present the slide
2. Ask students to THINK about how the two items are both the SAME AND DIFFERENT.
3. Do not allow conversation at this time -- give ample think time for students to consider the possibilities
4. After some time has been given (a minute or so), ask students to talk with their Number Head partner or small group about their ideas -- allow this conversation to dominate the time dedicated to this routine
5. As students talk with partners/groups, walk around and listen to the conversations. Resist jumping in; let them grapple with the ideas with their peers.
6. As you walk around listening, take notes. You will use these notes to help direct the whole group conversation.
7. Refocus student attention to the front of the room for a whole group debriefing session. Ask students to share some of their ideas about how the two were both the SAME and DIFFERENT – use the notes you took to bring out important ideas that will benefit the entire room.

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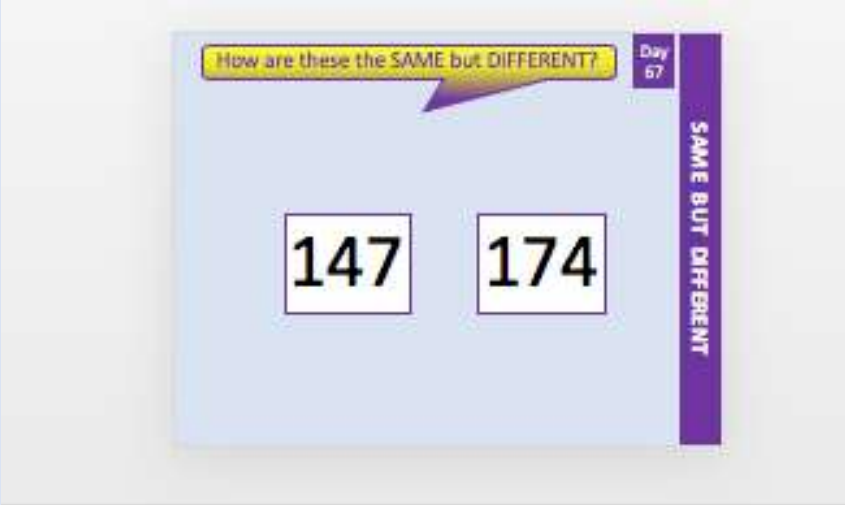
Day 67

Use the NEXT SLIDE with students.

Here is are some possible responses. This list is not all-inclusive. Additional ideas encouraged!

- Students may simply recognize a component that makes them the “same” OR “different”
- Some students may state a same/different relationship and say that they are the “same because ____ but different because….”



Possible Responses

- Both have the DIGITS 1, 4 and 7
- Both are three-digit numbers
- Both are less than 200
- Both are greater than 100
- 147 has 4 tens and 7 ones
- 174 has 7 tens and 4 ones
- 174 has a greater value than 147
- They would fall on different places on a number line
- They do not represent the same quantity

SAME BUT DIFFERENT

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How are these the SAME but DIFFERENT?

Day 67

SAME BUT DIFFERENT

147

174

Day 68

SPLAT!

Directions for SPLAT! routines

SPLAT! is a number sense activity that was developed by an educator in Oregon. There are dozens of SPLAT! activities including SPLAT! within ten, multi-SPLAT!, colored SPLAT!, and fraction SPLAT!

In order for SPLAT! to work correctly, you will want to keep this activity in PowerPoint format.

To learn more about Steve Wyborney's Splat activity, click this link
http://www.stevewyborney.com/?p=893

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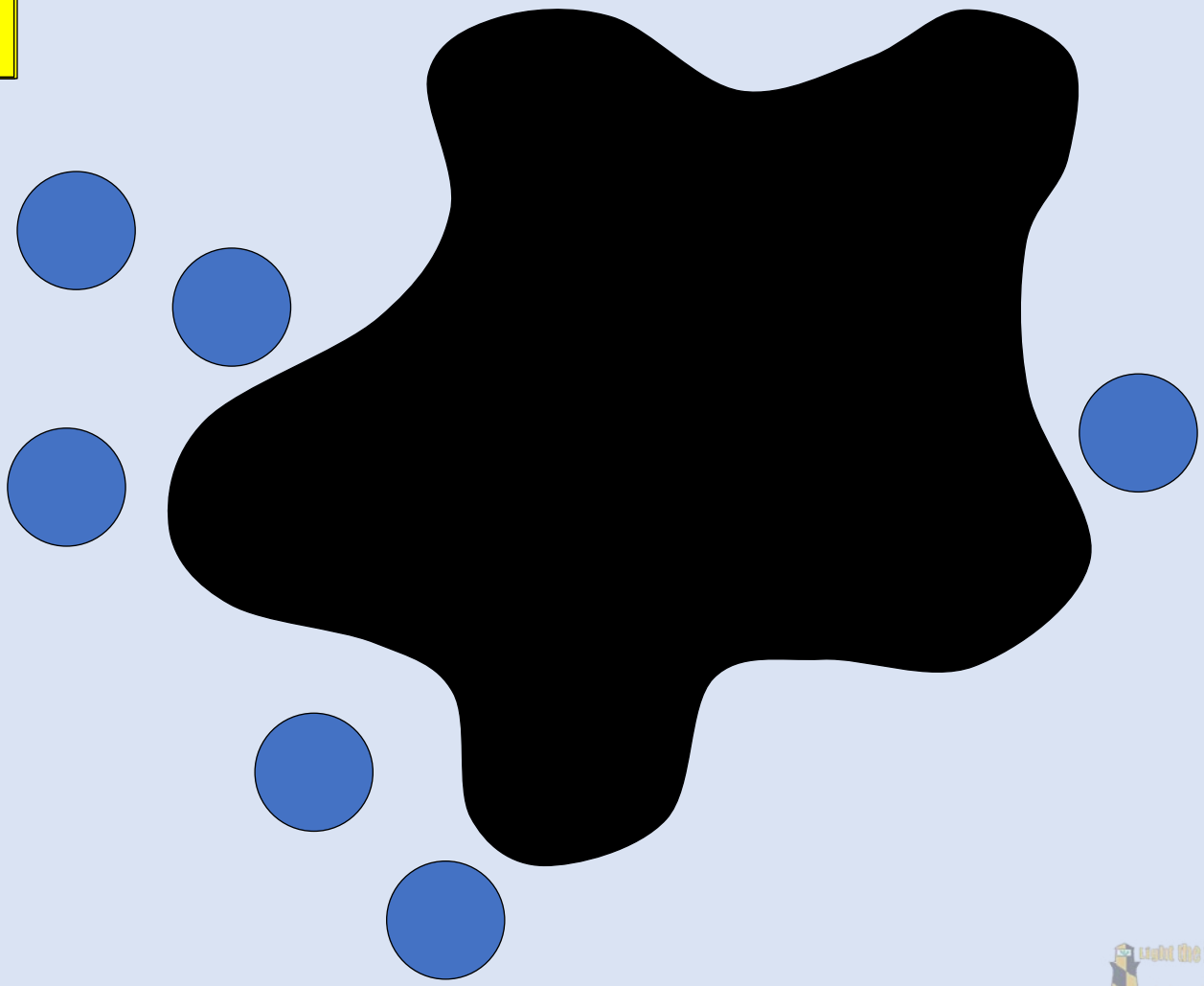
14

Day 68

SPLAT!

What can we learn from this picture?



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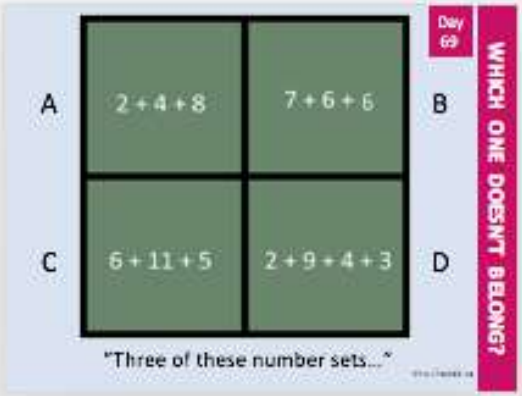
Day 69

Use the NEXT SLIDE with students.

Here is are some possible responses. This list is not all-inclusive.
Additional ideas encouraged!



Possible Responses:

- Three of these number sets have addends that are a mix of even and odd numbers. Set A only has even numbers.
- Three of these number sets equal an even number when added. Set B has a sum that is an odd number.
- Three of these number sets only use single-digit addends. Set C has a double-digit addend.
- Three of these number sets use only 3 addends. Set D has 4 addends.

WHICH ONE DOESN'T BELONG?

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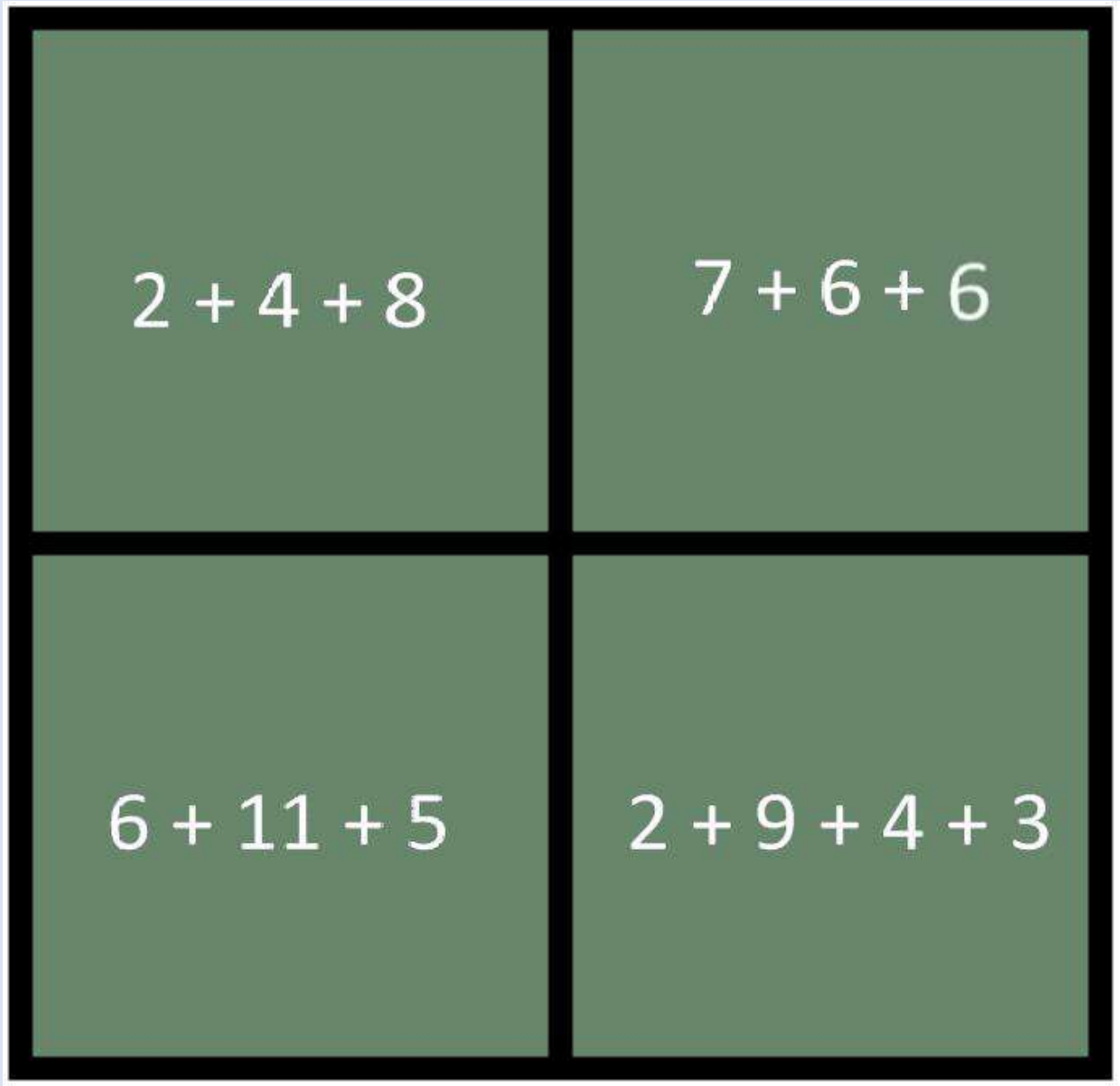
Day 69

WHICH ONE DOESN'T BELONG?



"Three of these number sets…"

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Counting Back by 10s

Day 70

Let's count back by 10s beginning with 197.
What number is 10 less than 197?
Watch for PATTERNS that happen as we count.
I will chart the numbers as we say them together, so let's count slowly.

197	187	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

CHORAL COUNTING

Day 70

Use the NEXT SLIDE with students.

Here is are some possible responses. This list is not all-inclusive. Additional ideas encouraged!

197	187	177	167	157
147	137	127	117	107
97	87	77	67	57
47	37	27	17	7

Possible Patterns Noticed:

- The tens value in each column alternates (9,4,9,4 in the first column)
- The value in each column is 50 less than the number above it.
- The value in each column is 50 more than the number below it.
- All of the numbers end in 7 (discuss why that happened - since we were counting by 10s, the ones values was not affected)
- PREDICT: **Can you predict what number would be ABOVE the 157?** (207 – notice the pattern)

CHORAL COUNTING

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Day 71

Esti-Mystery

Estimation Activity with clues!

NOTE: Try using an individual or class number chart to help students chart and track the possible solution.

Students use clues to solve the estimation mystery. After all clues are revealed, students will have enough information to determine if their initial estimate was correct.

Clues are revealed one at a time with time to discuss and refine original estimates after EACH clue is revealed. No one should be stuck with their original estimate – encourage mindful refinements.

After each clue, the number chart will automatically cover up the eliminated numbers, so be sure to discuss student ideas BEFORE advancing the slide.

ESTIMATION

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Before seeing the clues, estimate how many objects are in the vase.

As the clues appear, use the information to narrow the possibilities to a smaller set. Then use estimation to determine which of the remaining answers is the most reasonable.

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Clue #1

The answer is between 1 and 40.

Clue #2

Cross off the numbers that are part of this pattern: 2, 4, 6, …

Clue #3

Cross off the numbers that are part of this pattern: 3, 6, 9, …

Clue #4

Cross off the numbers that are part of this pattern: 5, 10, 15, …

Clue #5

One of the objects sank. It has 3 colors. The answer does not include the digit 3.

By combining the clues and estimation, you now have enough information to determine the answer.

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The Reveal
Click to see the answer.

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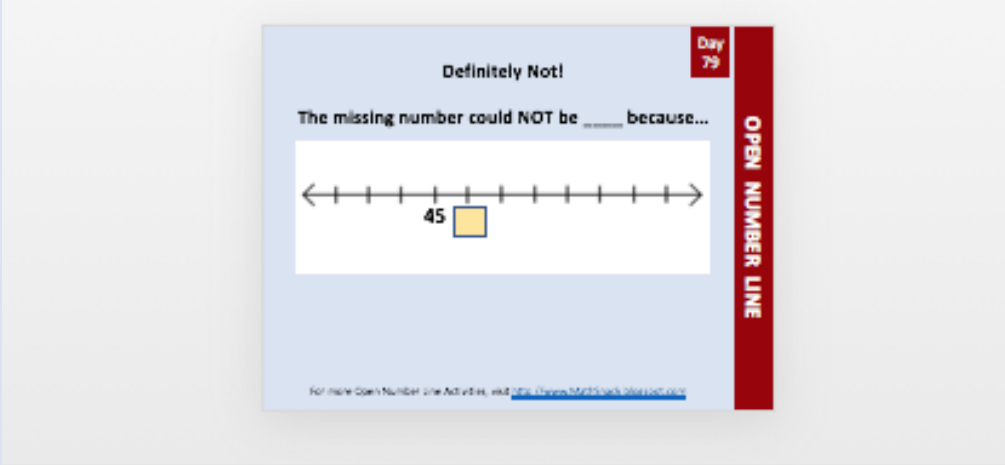
www.stevewyborney.com

Use the NEXT SLIDE with students.

Here is are some possible responses. This list is not all-inclusive. Additional ideas encouraged!

Day 72

OPEN NUMBER LINE



This number activity is called "Definitely NOT".
Students should name numbers that are LESS THAN 45 since the prompt is asking what number could the box NOT be.

Help students to understand that the missing number could be ANY number greater than 45 (including 46, 50, 100, etc..)
The value of the intervals changes when the missing number changes.

Ask:

- If the missing number is 50, what is the interval? (5)
- If the missing number is 47, what is the interval? (2)
- If the missing number is 45, what is the interval? (10)
- If the missing number is 95, what is the interval? (50)
- If the missing number is 52, what is the interval? (7)

For more Open Number Line Activities, visit http://www.MathSnack.blogspot.com

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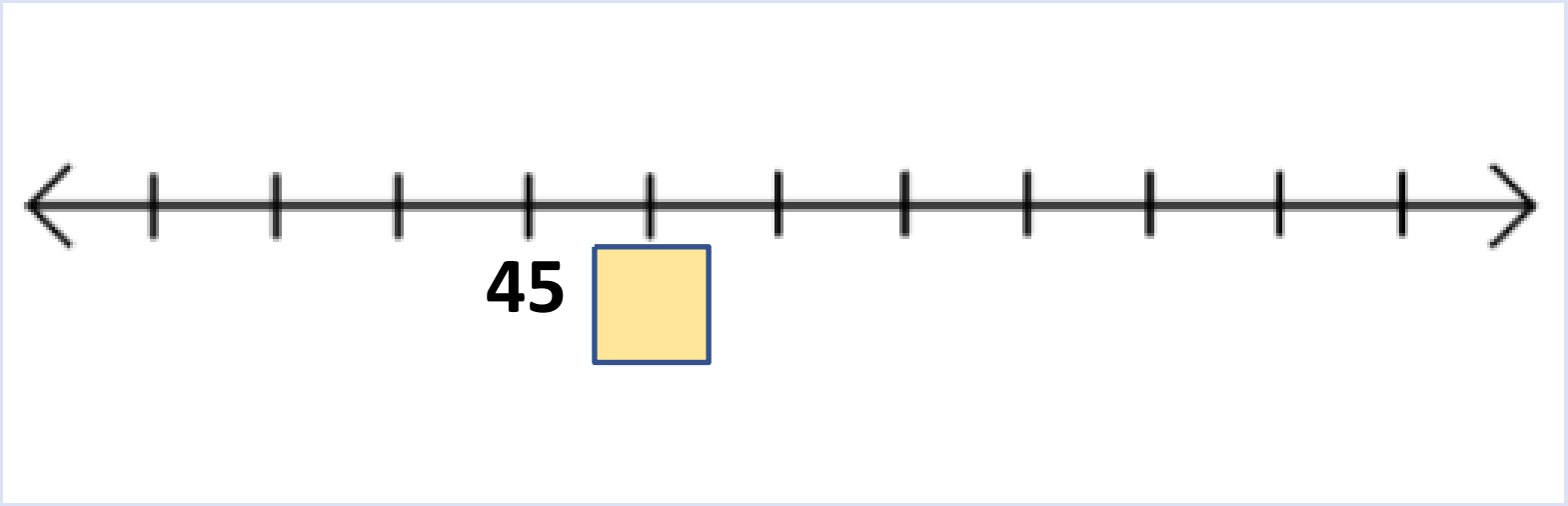
Day 72

Definitely Not!

The missing number could NOT be ____ because…



OPEN NUMBER LINE

For more Open Number Line Activities, visit http://www.MathSnack.blogspot.com

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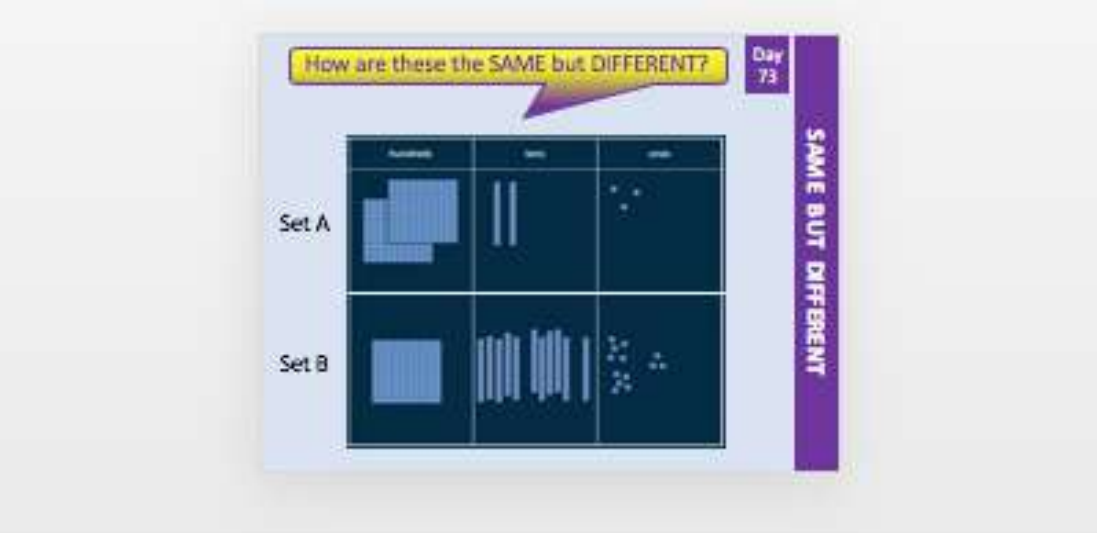
Day 73

Use the NEXT SLIDE with students.

Here is are some possible responses. This list is not all-inclusive.
Additional ideas encouraged!

- Students may simply recognize a component that makes them the “same” OR “different”
- Some students may state a same/different relationship and say that they are the “same because…. But different because….”
- **Remember to give TIME & SPACE for students to think and discuss with partners.**



POSSIBLE RESPONSES

Both represent a value of 223
Both used hundreds, tens, and ones base ten blocks
Set A represented the value with the least possible blocks vs. Set B decomposed a hundred into tens and decomposed a ten into ones.
Set A has 2 hundreds flats vs. Set B used just 1 hundreds flat
Set A used 2 ten rods vs. Set B used 11 ten rods
Set A used 3 unit cubes vs. Set B used 13 unit cubes

SAME BUT DIFFERENT

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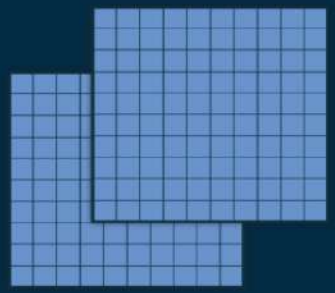
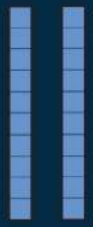
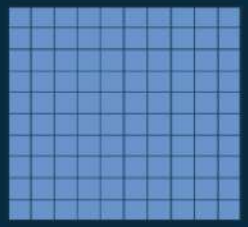
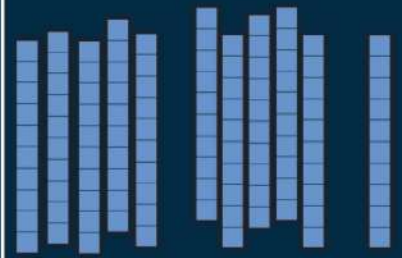
How are these the SAME but DIFFERENT?

Day 73

SAME BUT DIFFERENT

	hundreds	tens	ones
Set A			
Set B			

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Use the NEXT SLIDE with students.

Here is are some possible responses. This list is not all-inclusive.
Additional ideas encouraged!

Day 74

WHICH ONE DOESN'T BELONG?

3 of the clocks are analog clocks (have hands). Clock A is a digital clock.
3 of the clocks show a time of 1:xx. Clock B shows a time of 11:xx, not 1:xx
3 of the clocks do not have a second hand. Clock C has a second hand (the thin red hand)
3 of the clocks have numbers on them. Clock D does not have any numbers.

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Day 74

WHICH ONE DOESN'T BELONG?

A

B

C

D

"3 of the clocks…"

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Use the NEXT SLIDE with students.

Here is are some possible responses. This list is not all-inclusive.
Additional ideas encouraged!

Day 75

DECIDE & DEFEND

This task is not about telling time; rather, it is about adding several addends to arrive at a single sum.
Give students time to think and discuss their ideas with partners/groups.
Students will likely use a variety of strategies to find the sums.
Listen as students discuss to determine which student's ideas would contribute to the learning.
Help students explore the various strategies to discover which ones were more effective than others.

Kate = 55 minutes
David = 50 minutes

Use Numbered Heads

READ to Understand

Decide

Draft

Defend

Reflect

LET'S READ!

Day 75

Mr. Ling's class is having a contest.
The student who reads the most minutes in a week wins a new book.

Who won, Kate or David?

Kate read 15 minutes on Monday, Tuesday, and Wednesday and she read 5 minutes on Thursday and Friday.

David read 10 minutes on Monday, Tuesday, Wednesday, Thursday, and Friday.

DECIDE & DEFEND

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Day 75

Reflect on Learning

- What was mathematically important in the problem?
- What new math idea did you learn today?

DECIDE & DEFEND

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Day 76

30 – 25
30 – 23
40 – 15
40 – 12

TEACHER NOTES

BEFORE

This slide has the String of expressions that you will use for today's Number Talk. You can use Smart Ink, right click for PowerPoint Pen, or convert this slide to Smart Notebook so you can easily annotate on the slide. The annotation is an important part of the routine. The expressions should be presented one-at-a-time with skills building on one another. Remember, students will come with a wide variety of strategies. Allow student sharing of these strategies and work toward determining which of the ways were most efficient and brain-friendly.

DURING

Decomposing the Subtrahend into its place values to subtract

The following number talks encourages students to first subtract the tens from the tens and then subtract the ones from the remaining power of ten to simplify the subtraction

Example: 40-12 --- students may think 40 – 10 = 30 (focus on the tens place) and then 30 – 2 = 28 (begin with the remaining 20 and subtract the 2 ones that still needed to be subtracted).

Remember, students will come with a wide variety of strategies. Allow student sharing of these strategies and work toward determining which of the ways were most efficient and brain-friendly.

AFTER

After solving the expressions with various strategies, help students to understand how these expressions were all related.

NUMBER TALK

Calvert County Public Schools

Day 76

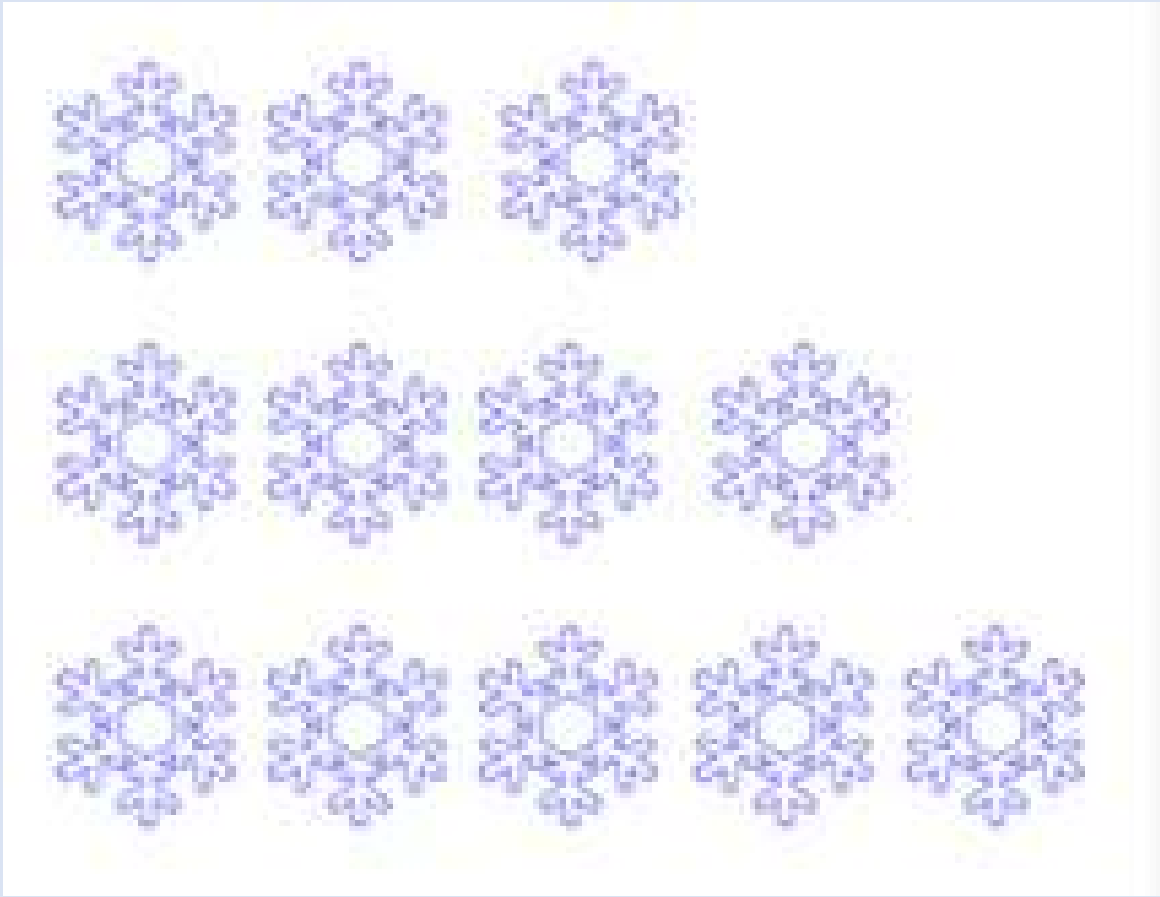
30 – 25

NUMBER TALK

Calvert County Public Schools

Day 77

What do you NOTICE?



QUICK COUNT

Calvert County Public Schools

Day 77

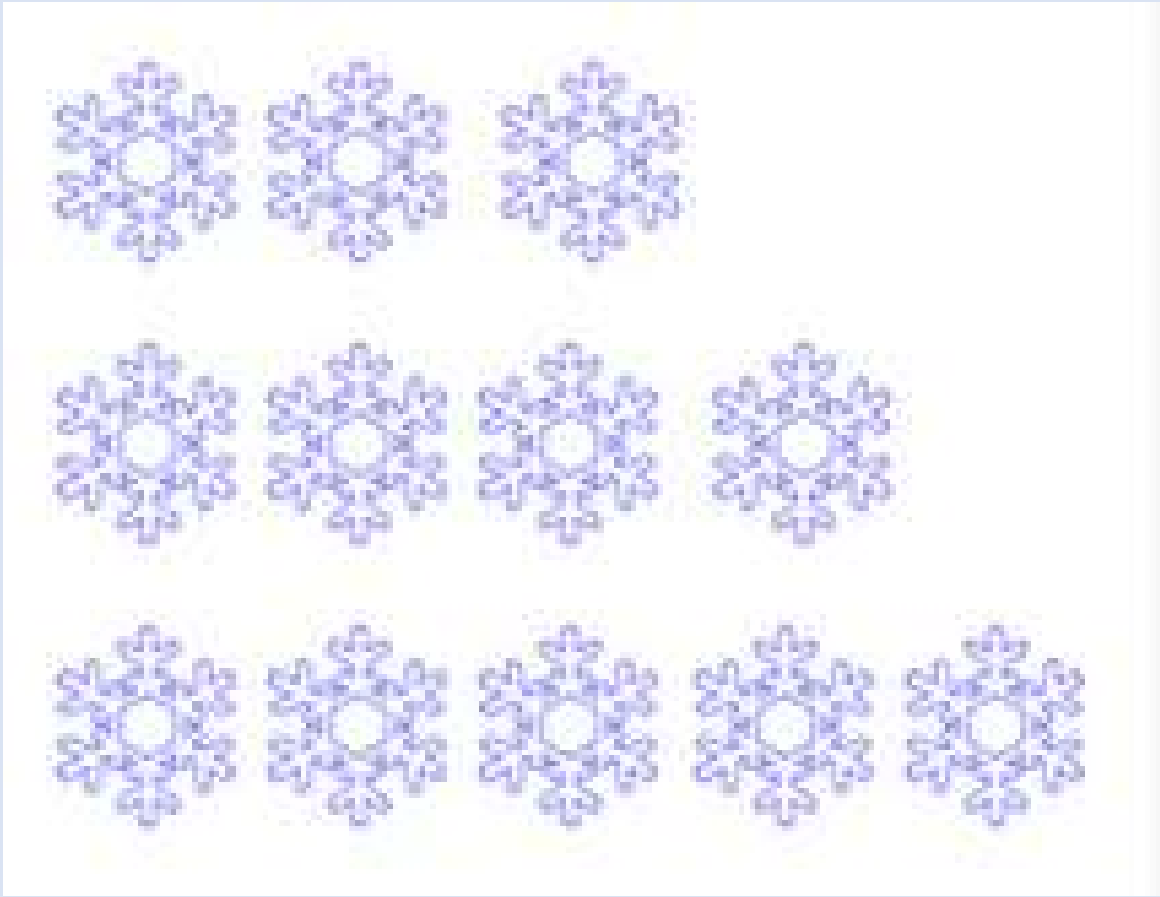
QUICK COUNT

What did you NOTICE?

Calvert County Public Schools

Day 77

How many do you see?
What counting shortcut did you use?



QUICK COUNT

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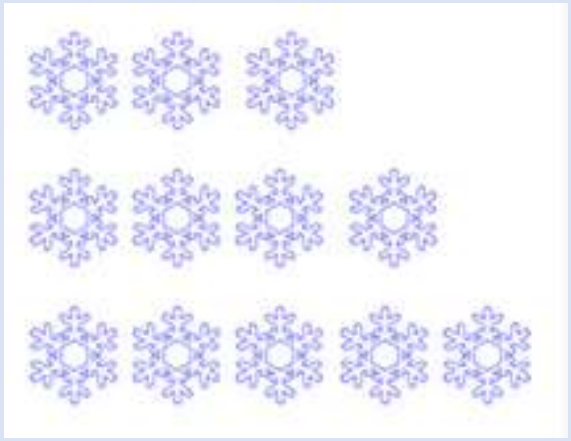
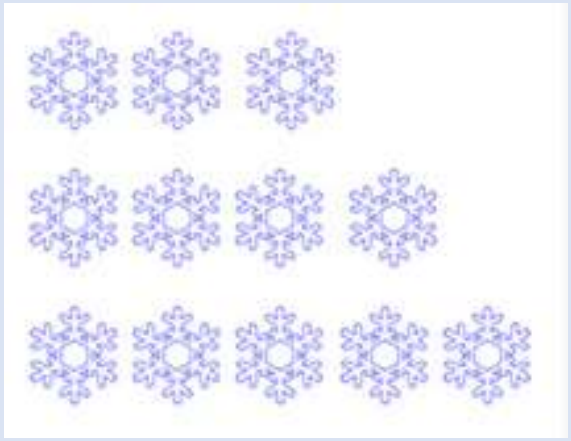
I noticed ____ so I _____

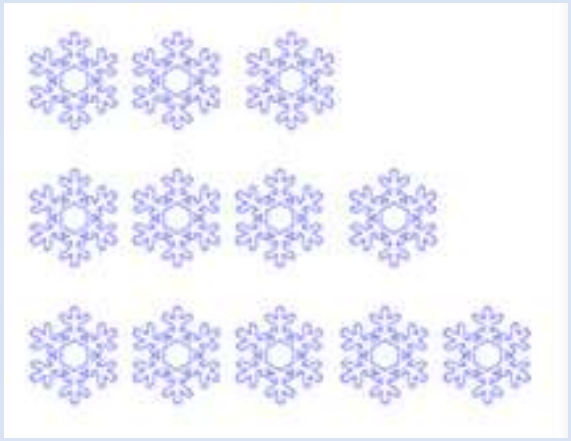
(They) noticed ____ so they___

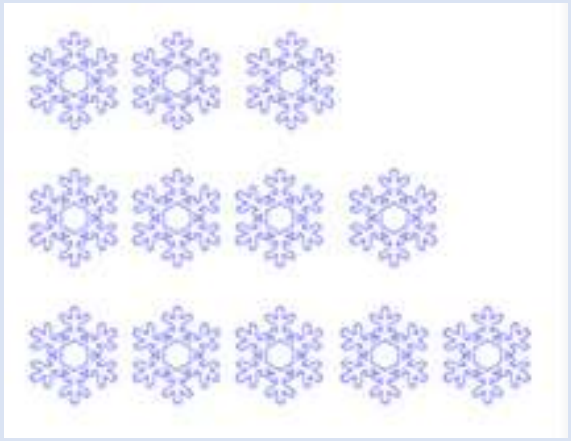
Day 77

QUICK COUNT









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Day 77

Reflect

What was mathematically important?

QUICK COUNT

How many blue shapes do you

Splat!

How many shapes are under the splat? How do

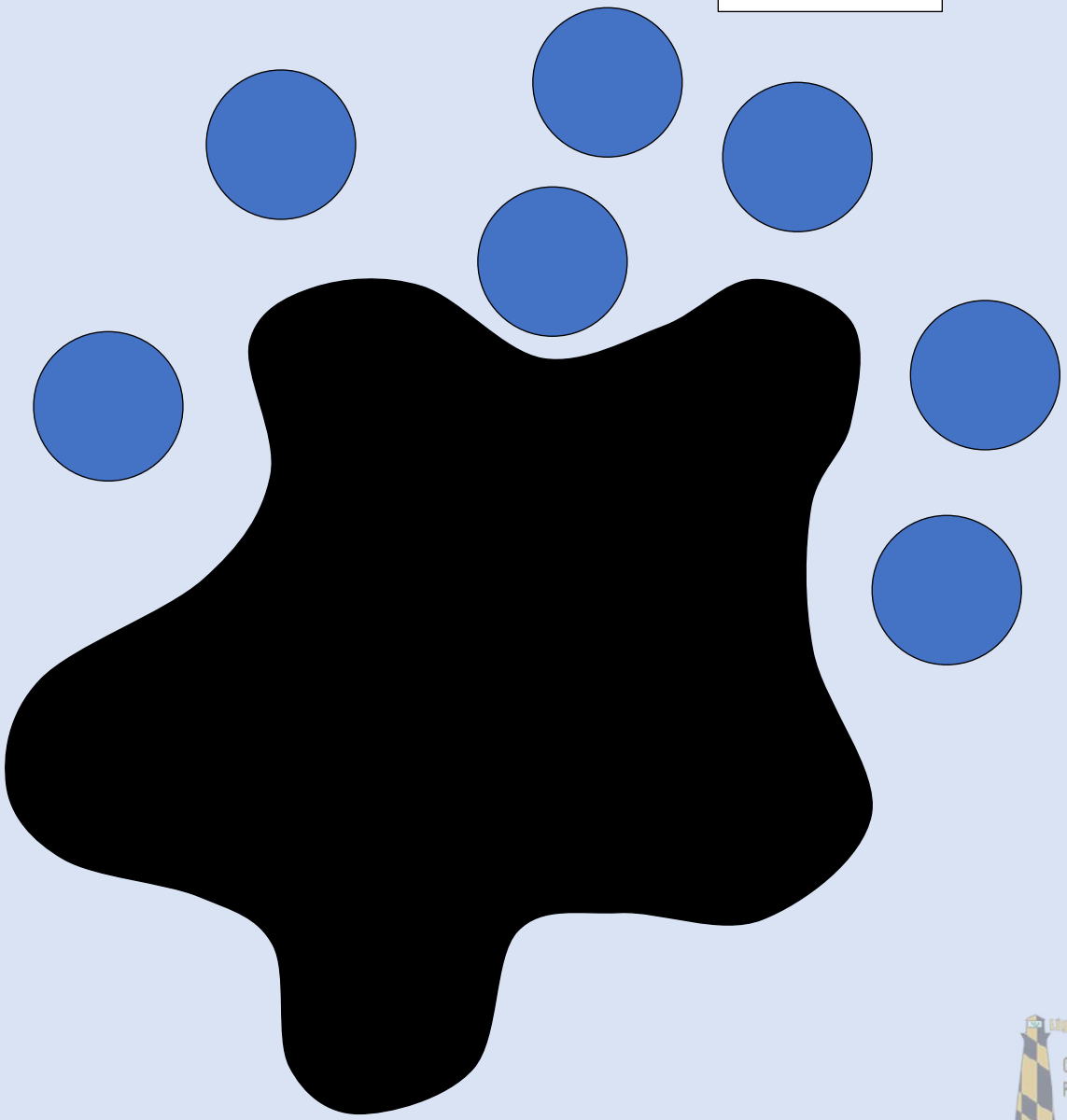
How else could you know?

Let's look under the splat to see how many shapes

What can we learn from this picture?

9

Day 78



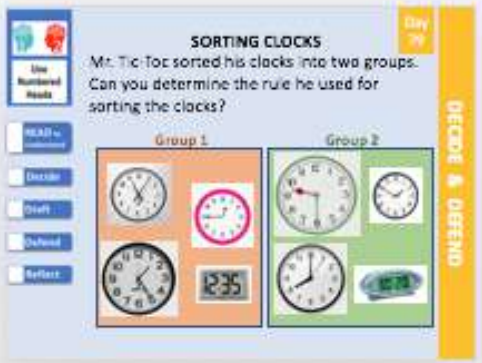
SPLAT!

Use the NEXT SLIDE with students.

Here is are some possible responses. This list is not all-inclusive.
Additional ideas encouraged!

Day 79

DECIDE & DEFEND



Give students plenty of time and space to notice and discuss these clocks with their partners.
As they grapple with solving the sorting rules, the discussions they have will be the most valuable part of the activity.
Listen as students talk and take notes on interesting ideas that are shared. When you come back to whole group discussion, call on the students whose ideas will generate thinking and reasoning.

Group 1: All of the times end with 5 ---- 11:05 / 12:45 / 1:25 / 12:35
Group 2: All of the times end with 0 ---- 9:30 / 1:50 / 8:00 / 10:20

Challenge/Extension: Are there any clock times that would NOT fit into either of Mr. TicToc's groups? (YES: 11:23, 1:17, etc.…)

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Use Numbered Heads

READ to Understand

Decide

Draft

Defend

Reflect

Day 79

SORTING CLOCKS

Mr. Tic-Toc sorted his clocks into two groups. Can you determine the rule he used for sorting the clocks?

Group 1

Group 2

DECIDE & DEFEND

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Day 79

Reflect on Learning

- What was mathematically important in the problem?
- What new math idea did you learn today?

DECIDE & DEFEND

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17 + 8 + 3
8 + 9 + 11
42 + 8 + 9

Day 80

NUMBER TALK

TEACHER NOTES

BEFORE

This slide has the String of expressions that you will use for today's Number Talk. You can use Smart Ink, right click for PowerPoint Pen, or convert this slide to Smart Notebook so you can easily annotate on the slide. The annotation is an important part of the routine. The expressions should be presented one-at-a-time with skills building on one another. Remember, students will come with a wide variety of strategies. Allow student sharing of these strategies and work toward determining which of the ways were most efficient and brain-friendly.

DURING

Adding more than 2 numbers efficiently

The following number talks consist of equations with more than 2 addends. Encourage students to look for partners to make decade numbers. The numbers do not have to be next to each other to be added since addition is both commutative and associative.

Example: *17 + 8 + 3. 17 + 3 make an easy 20 (decade number). 20 + 8 = 28.*

Remember, students will come with a wide variety of strategies. Allow student sharing of these strategies and work toward determining which of the ways were most efficient and brain-friendly.

AFTER

After solving the expressions with various strategies, help students to understand how these expressions were all related.

Day 80

17 + 8 + 3

NUMBER TALK

Light the Future
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