180 Days of
Number Sense Routines
Grade 5
Days 101-120

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.

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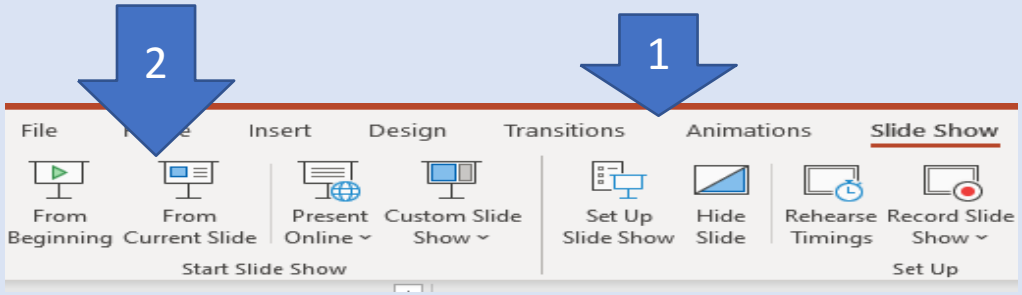
Number Sense Routines

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

Multiplying Fractions

Day 101

- Today we are going to **multiply a fraction by ½**
- I will chart your responses as we go, so we can discuss the patterns that occur when we multiply by ½
- We will begin with the fraction ¾
- **PREDICT:** As we count together, will the value of the next number increase or decrease in value?
- **DISCUSS:** It will decrease because we are multiplying by a number that is less than 1
- **CHART:** Chart student responses on the next page as you choral count.
- You do not need to complete every space on the chart but go far enough to establish the pattern to challenge student thinking.
- Let's begin: $\frac{3}{4}\ \frac{3}{8}\ \frac{3}{16}\ \frac{3}{32}\ \frac{3}{64}$
- **AFTER COUNTING:** Discuss the patterns discovered after you are finished charting responses --- you may want to pause midway, as well, to discuss emerging patterns.
- **FOCUS QUESTIONS:**
  - *Did the values increase or decrease? Explain how you know.*
  - *Why does the denominator value increase? What does this mean?*
  - *Did you notice that the numerator stays the same? Have students explain WHY this happens.*
  - *Did you also notice the pattern created by the ones place value of the denominator? 4, 8, 6, 2, 4, 8, 6, 2)*

CHORAL COUNTING

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Multiplying by ½

Day 101

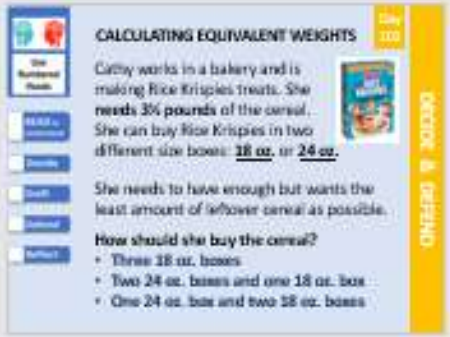
CHORAL COUNTING

$\frac{3}{4}$	$\frac{3}{8}$				

Day 102

Use the NEXT SLIDE with students.

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



3½ pounds = 56 ounces
3x16+8 (3 pounds x 16 ounces + 8 ounces which is ½ of a pound)
If needed, remind students that there are 16 oz. in each pound

Three 18 ounces boxes: 3 x 18 = 54 ounces [this is not enough]
Two 24 oz. boxes and one 18 oz. box: 2 x 24 + 18 = 66 ounces [10 ounces leftover]
One 24 oz. box and two 28 oz. boxes: 24 + 2 x 18 = 24 + 36 = 60 ounces [4 ounces leftover]
--- this is the best combination to have least amount of leftovers

DECIDE & DEFEND

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Use Numbered Heads

READ to Understand

Decide

Draft

Defend

Reflect

CALCULATING EQUIVALENT WEIGHTS

Day 102

Cathy works in a bakery and is making Rice Krispies treats. She **needs 3½ pounds** of the cereal. She can buy Rice Krispies in two different size boxes: **18 oz.** or **24 oz.**

She needs to have enough but wants the least amount of leftover cereal as possible.

How should she buy the cereal?

- **Three 18 oz. boxes**
- **Two 24 oz. boxes and one 18 oz. box**
- **One 24 oz. box and two 18 oz. boxes**

DECIDE & DEFEND

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Day 102

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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Esti-Mystery

Estimation Activity with clues!

Day 103

ESTIMATION

NOTE: Scrap paper or dry erase may be useful.
Also, students may benefit from a 100s chart to mark possibilities.

Students use clues to solve the estimation mystery.
After all of the 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.

Students may benefit from using paper and pencil to work through possibilities or consider creating a class chart where possibilities are added and crossed off as each clue is revealed.

How many flowers?

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.

NOTE: This routine only works when run in SLIDE SHOW mode of PowerPoint

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Clue #1

There are more than 20

Clue #2

It is a multiple of 8

Clue #3

$n < 6000 \div [25 \times (6 - 2)]$

Clue #4

Both digits are even numbers

Clue #5

It is the largest value of the 3 possibilities that remain

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

The Reveal
Click to see the answer.

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Day 104

7 x 70
14 x 35
35 x 18
12 x 45

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

Multiplication: Halving and Doubling

Possible reasonings:

- An efficient model of multiplying for some equations is to use the halving/doubling strategy. If you double one value and half the other value, the overall product remains the same. This is especially useful when one of the factors doubles to create a multiple of ten (i.e. 35 doubles to create 70).

    - 7x70=490
    - 14x35 = 7x70=490 (this is the SAME as the above for students to see the connection of halving/doubling)
    - 35x18=70x9=630
    - 12x45=6x90=540

Remember, students will come with a variety of strategies. During a Number Talk, the students explain their way of thinking. When students find ways that are especially efficient, highlight those strategies in the reflection that should follow the Talk. 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

Help students recognize the strategy of doubling and halving; it is a highly efficient strategy when doubling/halving) leads to a value that is a multiple of ten making multiplying easier.

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NUMBER TALK

Day 104

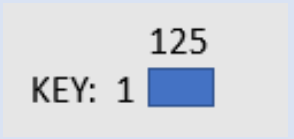
Use the NEXT SLIDE with students for the Number Talk

This page for teacher information to build deeper understanding of the halving/doubling strategy.

Model of the Halving/Doubling Strategy

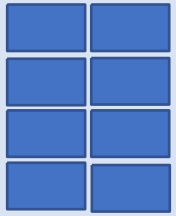
8 x 125

Halve it Double it



4 x 250 ← Easier to solve

Halve it Double it



2 x 500 ← Even Easier to solve

NUMBER TALK

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NO PAPER Needed! Think of mental strategies for efficient calculations.
How are the first and second expressions related?
How can you use that information to solve the last two expressions?

Day 104

NUMBER TALK

7 x 70

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Day 105

FRACTIONS on the NUMBER LINE

OPEN NUMBER LINE

INITIAL PROMPT

- On a Post-It or other small piece of paper, have each student write a fraction.
- As you write your fraction, think about whether your fraction is greater or less than 1 whole. How do you know? Encourage discussion with partners.
- Consider whether your fraction is greater or less than ½. How do you know? More partner discussion before beginning the whole class activity with the slips of paper.

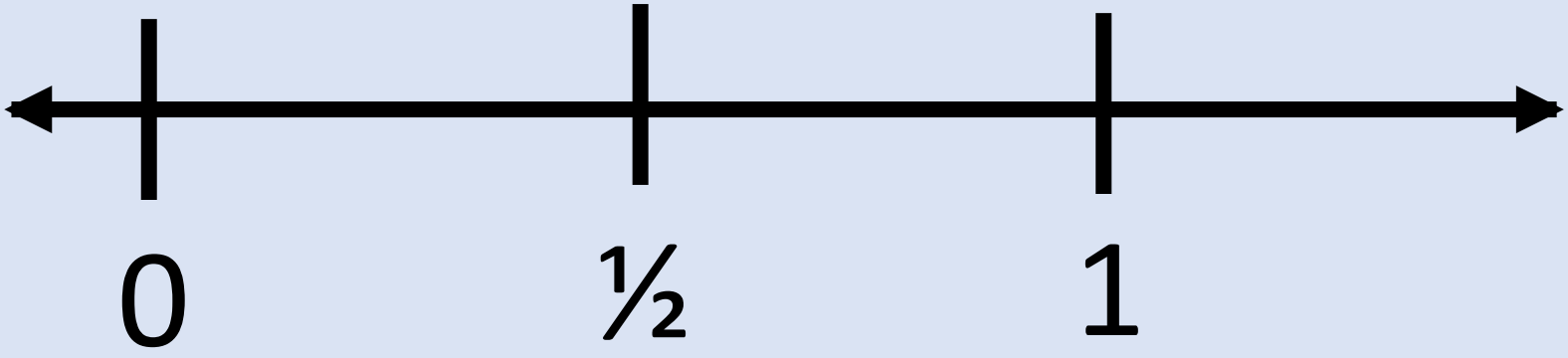
ACTIVE ENGAGMENT

The goal of this next part is to place fractions on the number line (use the next slide if desired). With a class full of students this could be chaos without the proper management.

- Begin by saying, "I am looking for 2 fractions that would fall between 0 and ½. Students will raise hands. Pick two and collect their slips of paper.
- Read each fraction one at a time and ask the class if the fraction meets the criteria of falling between 0 and ½. Be sure to have students provide the reasoning.
- Have students discuss which of the two would fall CLOSER TO ZERO and discuss the reasoning.
- Next ask for 2 fractions that fall between ½ and 1. Repeat the process described above.
- Finally, ask for 2 fractions that would be greater than 1. Repeat the process described above.
- If you wish to include a written component, have student teams write a paragraph or number line diagram where the remaining fractions within their group would fall on the number line AND the REASONING (remember, you only used 6 of the slips of paper from earlier).

Day 105

OPEN NUMBER LINE



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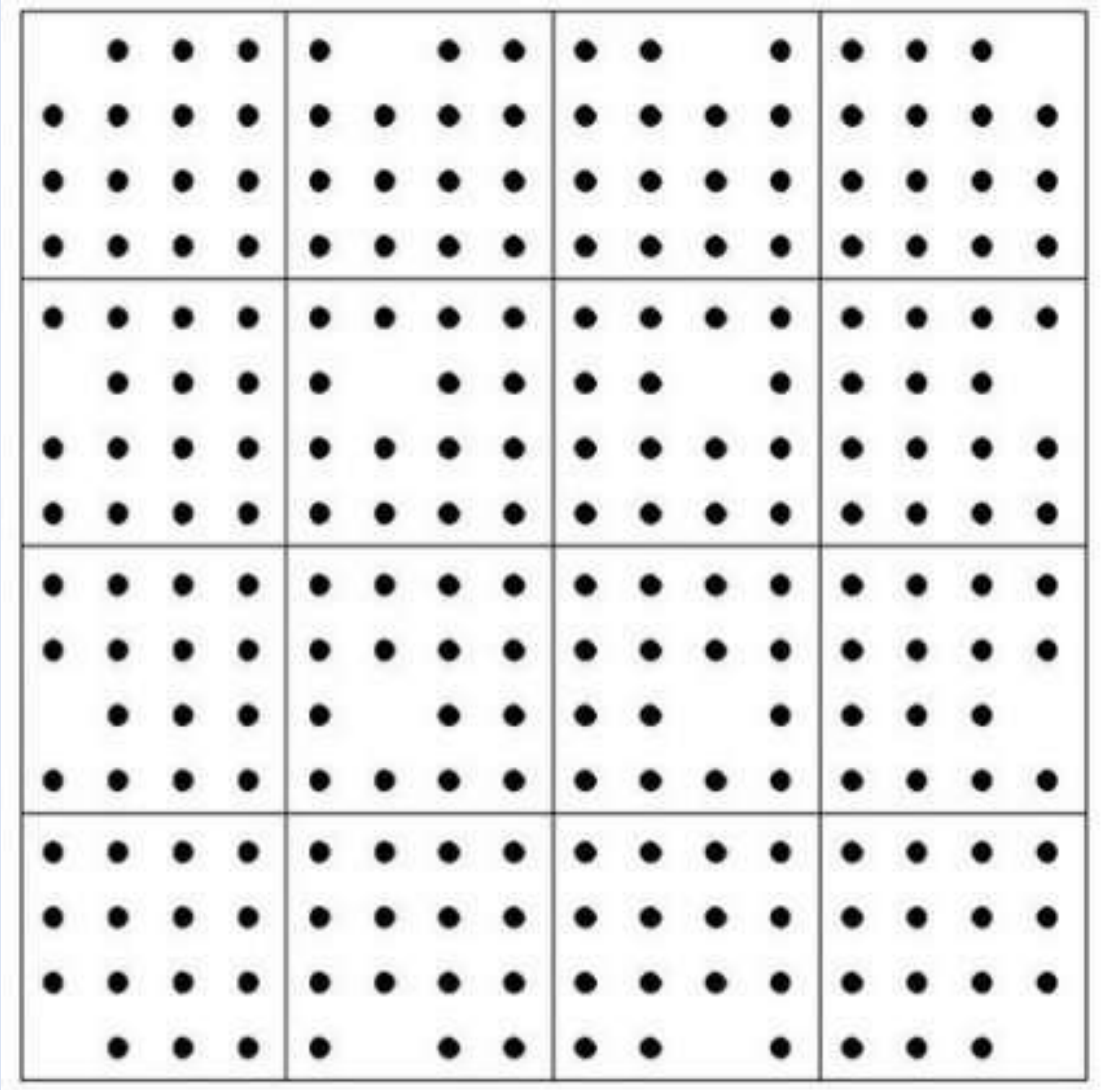
Directions for QUICK COUNT routines

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 106

What do you notice?



QUICK COUNT

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Day 106

QUICK COUNT

What did you NOTICE?

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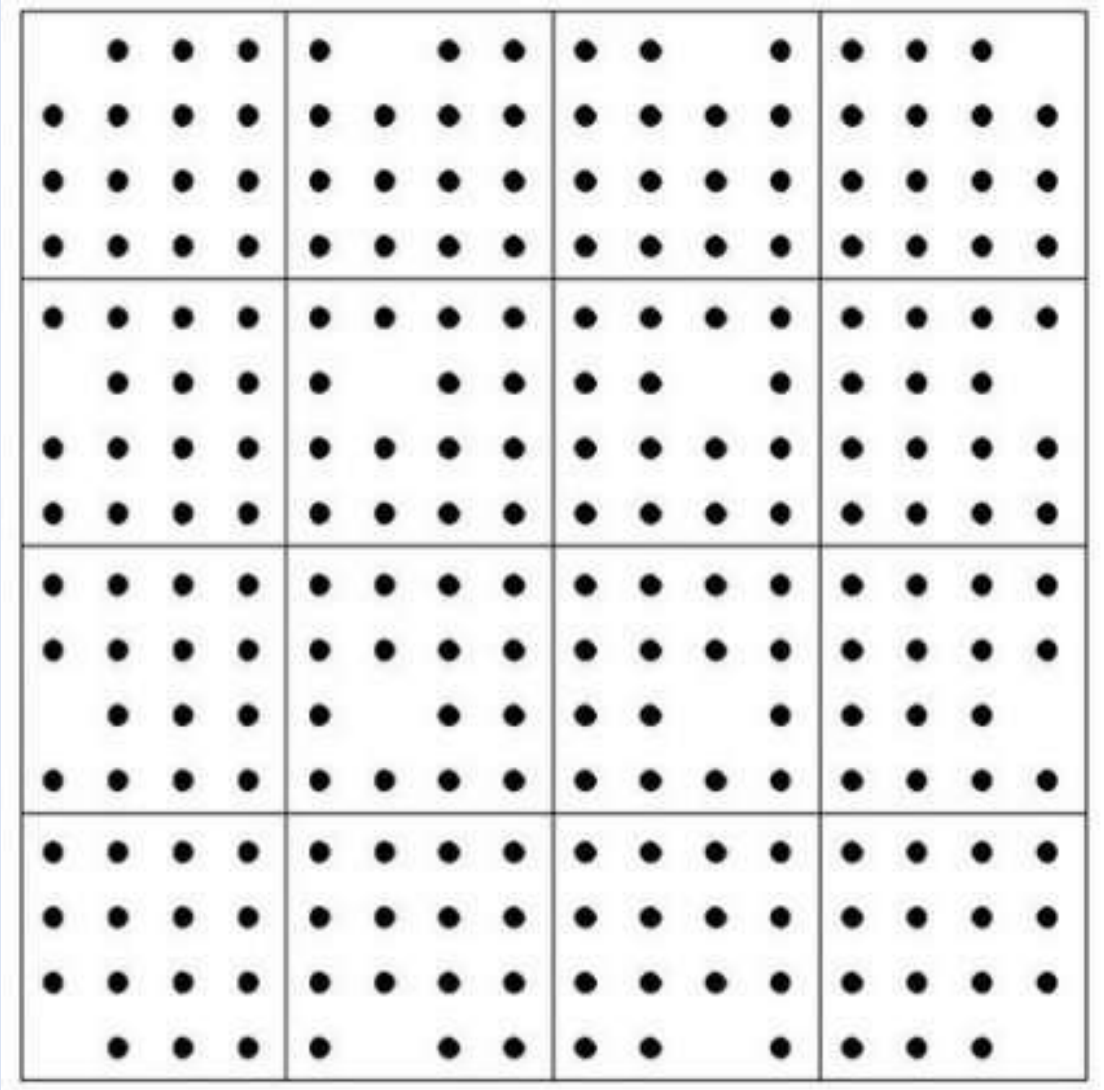
Day 106

How many dots?

What counting shortcut did you use?



QUICK COUNT

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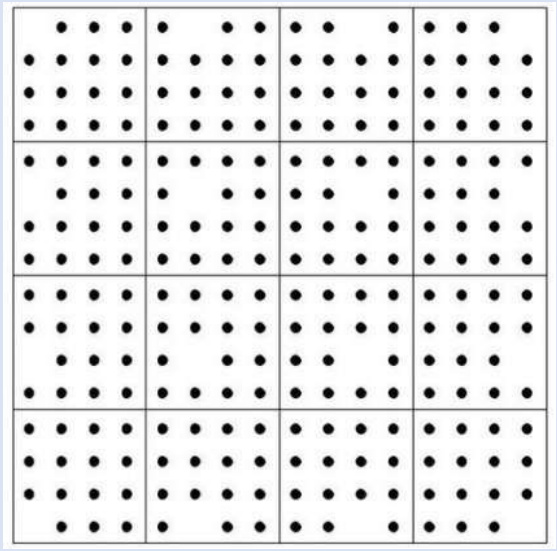
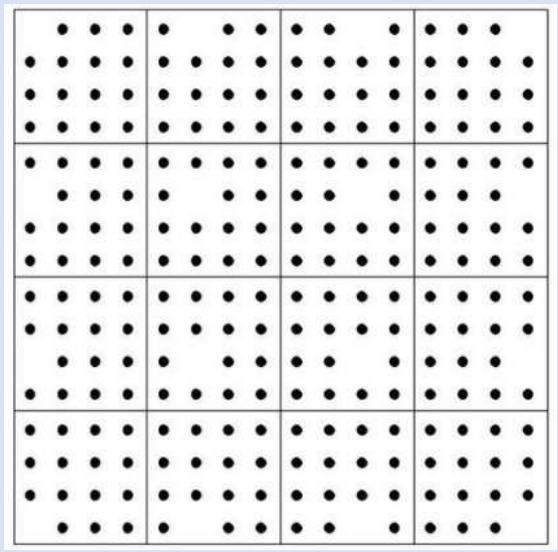
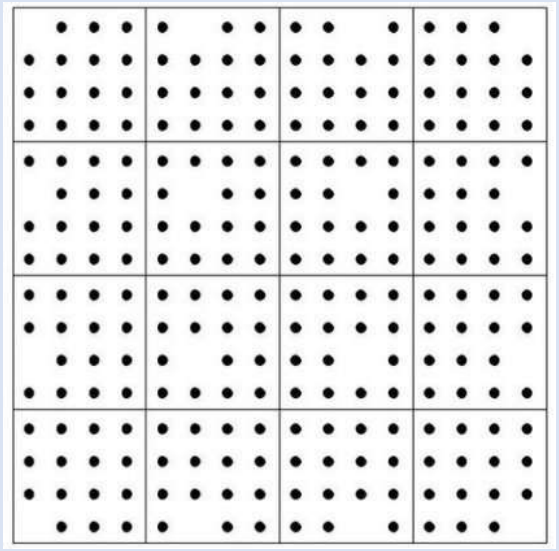
Day 106

I noticed ____ so I _____

(They) noticed ____ so they _____







QUICK COUNT

Day 106

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 107

SAME BUT DIFFERENT

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….”

9 x 20

18 x 10

POSSIBLE RESPONSES

- They are the same because both equal 180, but they do not use the same factors
- Students may notice that the factors in the first expression are just doubled and halved to create the second expression
- Some students may notice that both expressions are multiplied by a factor of 10 (x20 and x10)
- Both are multiplication expressions

How are these the SAME but DIFFERENT?

Day 107

SAME BUT DIFFERENT

9 x 20	18 x 10

What number does

Splat!

What is the total under the splat?

How else could you know?

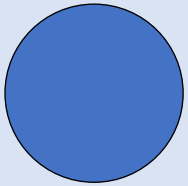
Let's look under the splat to see

What can we learn from this picture?

4

Day 108

SPLAT!



Steve Wyborney

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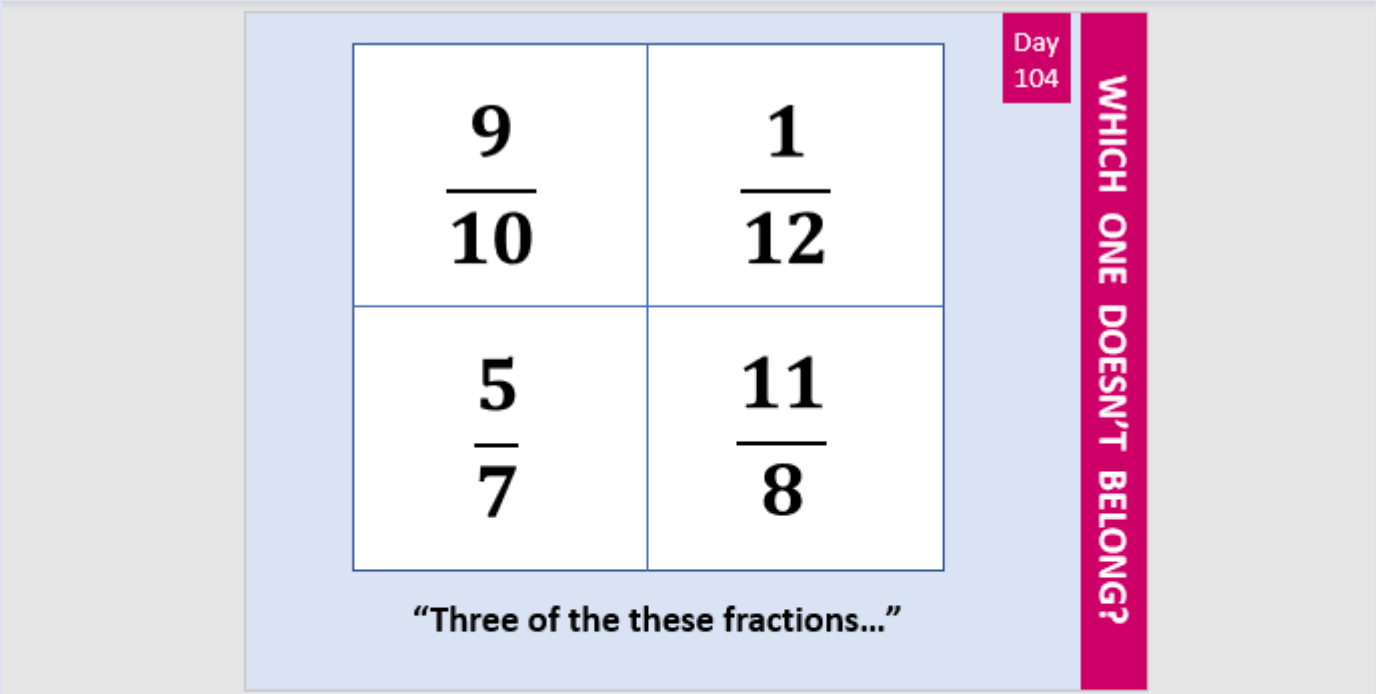
Use the NEXT SLIDE with students.

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

Day 109

WHICH ONE DOESN'T BELONG?



Possible Responses:

- Three of these fractions are more than one part away from a whole. 9/10 is not more than one part from a whole, it is exactly one part from a whole.
- Three of these fractions have a value that is greater than ½. The fraction 1/12 is not greater than ½.
- Three of these fractions are partitioned into an even number of parts. The fraction 5/7 is not an even number of parts since 7 is an odd number.
- Three of these fractions have a value that is less than one whole. The fraction 11/8 has a value that is more than one whole.

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Day 109

WHICH ONE DOESN'T BELONG?

$\frac{9}{10}$	$\frac{1}{12}$
$\frac{5}{7}$	$\frac{11}{8}$

$\frac{1}{2}$

"Three of these fractions…"

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Day 110

Multiplying fractions

- Today we are going to **multiply a fraction by 2**
- I will chart your responses as we go, so we can discuss the patterns that occur when we multiply by 2
- We will begin with the fraction ¾
- **PREDICT:** As we count together, will the value of the next number increase or decrease in value?
- **DISCUSS.** It will increase because we are multiplying by a number that is greater than 1
- **CHART:** Chart student responses on the next page as you choral count.
- You do not need to complete every space on the chart but go far enough to establish the pattern to challenge student thinking.
- Let's begin: $\frac{3}{4}\ \frac{6}{4}\ \frac{12}{4}\ \frac{24}{4}\ \frac{48}{4}$
- **AFTER COUNTING:** Discuss the patterns discovered after you are finished going around the circle and charting responses
- **FOCUS QUESTIONS:**
  - *Did the values increase or decrease? Explain how you know.*
  - *Did you notice that the denominator stays the same? Have students explain WHAT this means in terms of the fraction (number of pieces to make one whole does not change) and WHY this happens.*
  - ***What strategies did you use to multiply mentally? Discuss.***

CHORAL COUNTING

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Multiplying fractions (x2)

Day 110

CHORAL COUNTING

$\frac{3}{4}$	$\frac{6}{4}$				

NOTE: This routine only works when run in SLIDE SHOW mode of PowerPoint

Day 111

Esti-Mystery

Estimation Activity with clues!

Students use clues to solve the estimation mystery.
After all of the 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.

Students may benefit from using paper and pencil to work through possibilities or consider creating a class chart where possibilities are added and crossed off as each clue is revealed.

ESTIMATION

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How many blueberries?

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.

NOTE: This routine only works when run in SLIDE SHOW mode of PowerPoint

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Clue #1

There are more than 43 + 2 x 5

Clue #2

The number is less than

10 x [66 ÷ (2 + 9)]

Clue #3

It is an ODD number

Clue #4

The number is NOT PRIME

Clue #5

You should have two choices.

It's not the 55!

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

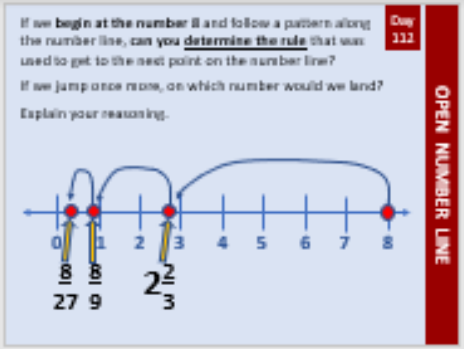
The Reveal
Click to see the answer.

Use the NEXT SLIDE with students.

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

Day 112

OPEN NUMBER LINE



- The rule followed was to multiply by 1/3 –OR- to divide by 3 (NOT divide by 1/3)
  It is important that students recognize that BOTH rules yield the same results.
- It may be easier if students see 2-2/3 as its equivalent of 8/3: 2=6/3, then 6/3+2/3=8/3 ---- seeing 8/3 to 8/9 to 8/27 shows the pattern more easily
- If we jump once more, we would land on 8/81 which is slightly less than 1/10 of 1.
- Another important note is that the jump will NEVER be to the left of 0 (zero); it simply 1/3 of the previous jump but never gets all the way to zero – if they don't believe you, keep going with the numbers (the jumps will be too small to show at this point in the process).
- Point out to students that each jump is exactly 1/3 the distance of the previous jump. This is an important visual connection to make when discussing the somewhat abstract topic of fractions.
- 8, 8/3, 8/9, 8/27 (notice that 8/3 was written as its equivalent value of 2-2/3 – this would also be a good discussion).

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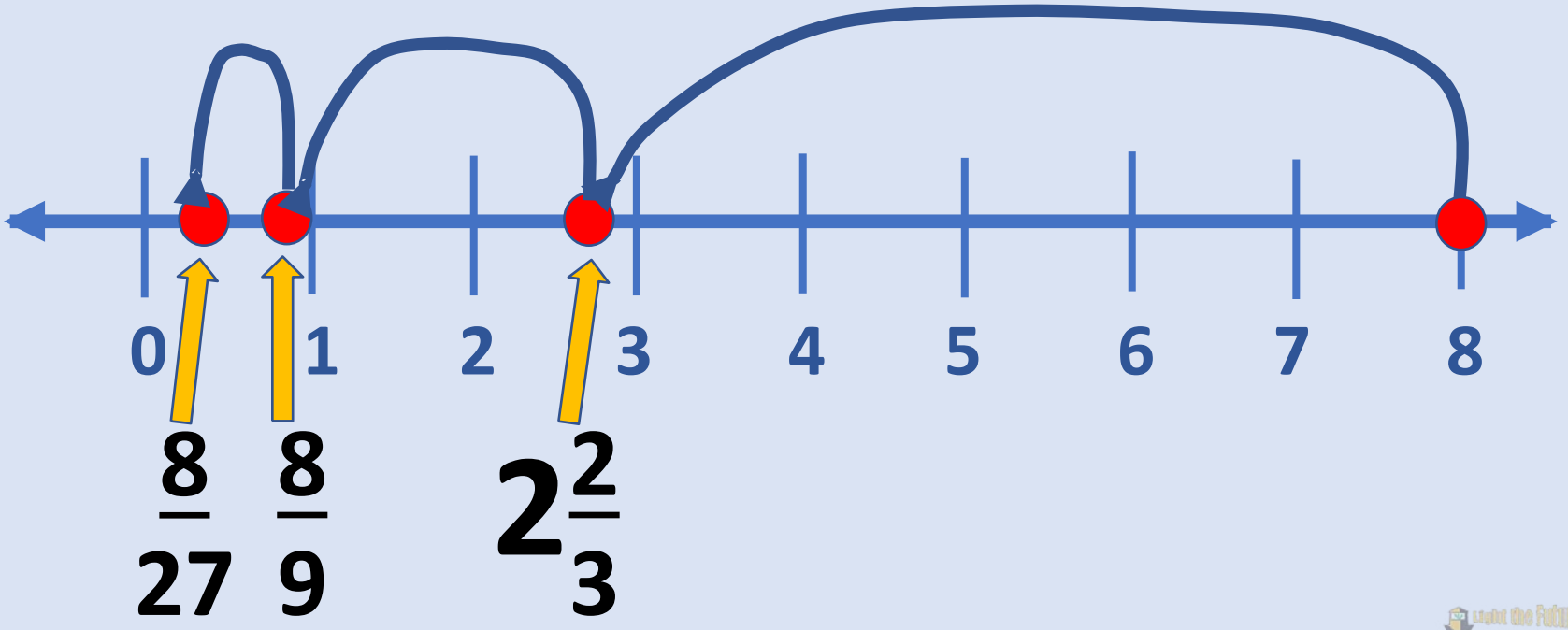
Day 112

OPEN NUMBER LINE

If we **begin at the number 8** and follow a pattern along the number line, **can you <u>determine the rule</u>** that was used to get to the next point on the number line?

If we jump once more, on which number would we land?

Explain your reasoning.

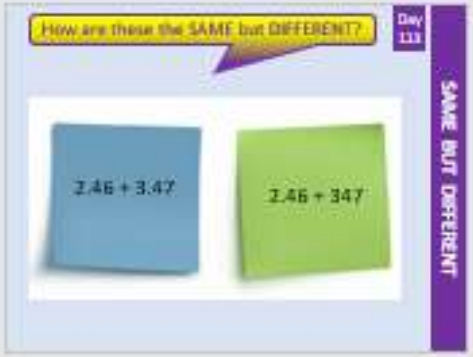


Day 113

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….”



2.46 + 3.47 vs. 2.46 + 347

- Both are addition expressions but will yield different sums
- Both have the digits 246 and 347 but the value of 347 is different because of the placement of the decimal
- The blue has a sum of about 5 or 6 while the green has a sum just over 349 (that’s quite a difference!)
- When lining these up to add, the 2 and 3 would be aligned with the blue, but the 2 aligns with the 7 on the green

SAME BUT DIFFERENT

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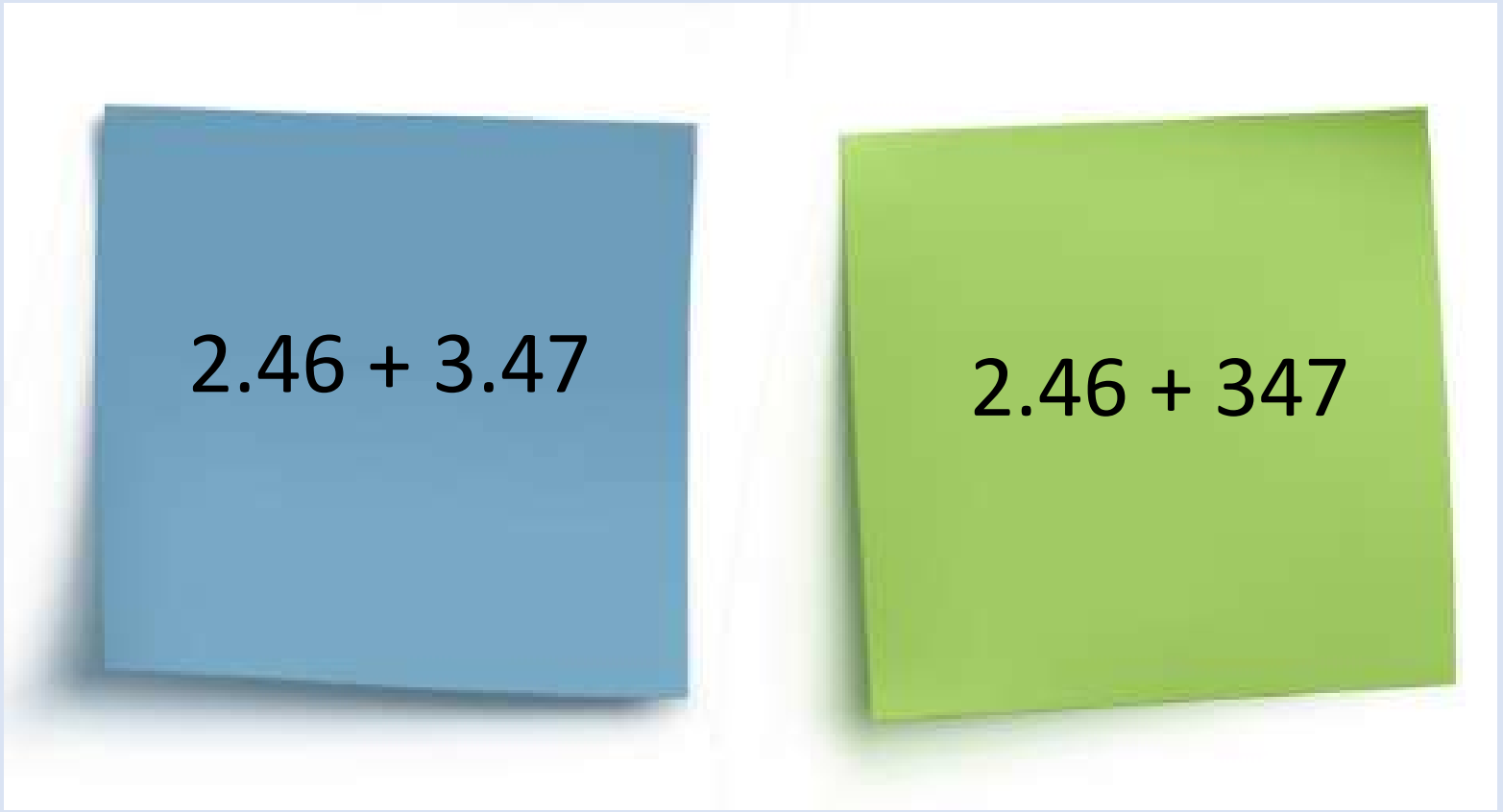
How are these the SAME but DIFFERENT?

Day 113



SAME BUT DIFFERENT

Calvert County Public Schools

Day 114

24 x 15
15 x 66
25 x 44
82 x 25

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

Multiplication: Halving and Doubling

Possible reasonings:

- We are continuing to reinforce students' understanding and proficient use of the doubling/halving strategy for multiplication.
- 24x15 >>> think 12x30 =360
- 15x66 >>> think 30x33=990
- 25x44 >>> think 50x22= 50x20 + 50x2 = 1000 + 100 = 1,100
- 82x25 >>> think 41x50 = 40x50 + 1x50 = 2000+50 = 2,050

Remember, students will come with a variety of strategies. During a Number Talk, the students explain their way of thinking. When students find ways that are especially efficient, highlight those strategies in the reflection that should follow the Talk. 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

Help students recognize the strategy of doubling and halving and how it is an efficient strategy if doubling (or halving) will lead to a value that is a multiple of ten making multiplying easier.

NUMBER TALK

How might halving and doubling help?

Day 114

24 x 15

NUMBER TALK

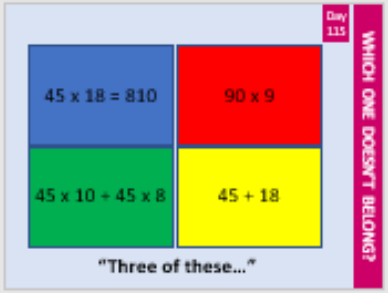
Calvert County Public Schools

Use the NEXT SLIDE with students.

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

Day 115

WHICH ONE DOESN'T BELONG?



Three of these are expressions that have not been solved. The BLUE box is an equation with a solution.
Three of these use the number 45 in the expression. The RED box does not have the number 45.
Three of these have ONE operation. The GREEN box has multiple operations that need to be performed to solve.
Three of these have a value of 810. The YELLOW box does not have a value of 810.

****NOTE: It is worth pointing out to students that there was no need to SOLVE to see they would have the same solution as the BLUE box:**

- RED makes use of the halving/doubling strategy explored earlier in a Number Talk
- GREEN box makes use of the Distributive Property based off of the BLUE box equation.

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Day 115

WHICH ONE DOESN'T BELONG?

$45 \times 18 = 810$	90×9
$45 \times 10 + 45 \times 8$	$45 + 18$

"Three of these…"

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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 116

DECIDE & DEFEND

4/5 is already much more than half and 4/10 is almost half of a bowl, so 4/5 + 4/10 is probably not less than 1 cup.
Tonya forgot that when you add fractions, you need common denominators.
We must make an equivalent fraction of 8/10 from the 4/5.
8/10 + 4/10 = 12/10 which is 2/10 MORE than a full cup since 12/10 = 10/10 + 2/10.

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Use Numbered Heads

READ to Understand

Decide

Draft

Defend

Reflect

Day 116

DECIDE & DEFEND

Tonya ate $\frac{4}{5}$ cup of rice.

Her sister Angie ate $\frac{4}{10}$ cup of rice.

Tonya said that altogether they ate less than one cup of rice since $\frac{4}{5} + \frac{4}{10} = \frac{8}{15}$

Is Tonya's reasoning correct?

How do you know?

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Day 116

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

Calvert County Public Schools

Day 117

1999 + 1999
22,499 + 22,499
104,298 + 104,298
1198 + 1199

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

Making Landmark or Friendly Numbers – Three and four-digit addends.
Both addends are one or two away from a multiple of ten or landmark number.

Possible reasonings:

- Students may recognize that 1999 is just one away from the Landmark number 2000. Students might quickly add 2000+2000=4000 then subtract the 2 additional that they added in to make the number easy to add.
- 22,499+22,499 >>> think 22,500+22,500=45,000 >>> 45,000-2 = 44,998
- 104,298+104,298 >>> think 104,300+104,300=208,600 >>> 208,600-4=208,596
- 1198+1199 >>> think 1200+1200=2400 >>> 2400-3=2397

Remember, students will come with a variety of strategies. During a Number Talk, the students explain their way of thinking. When students find ways that are especially efficient, highlight those strategies in the reflection that should follow the Talk. 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

Help students recognize that numbers that are very close to Landmark Numbers can be mentally added as those Landmark numbers and then the extra that we put in to make it a Landmark Number (Friendly Number) can be quickly subtracted back out at the end.

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NUMBER TALK

Day 117

1999 + 1999

NUMBER TALK

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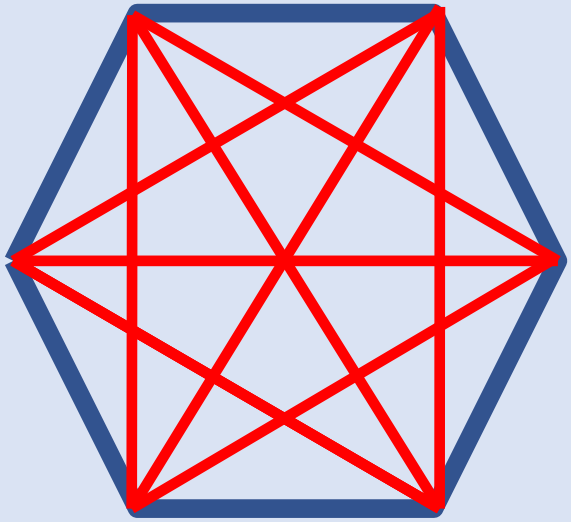
Use the NEXT SLIDES with students.

Day 118



Give plenty of partner discussion time on this image. You will likely hear many students discussing that there are 3 lines at each point and there are 6 points, so there must be 18 lines. Logical at first glance, but inaccurate.

BUT… if you allow more time for discussion, students will begin to realize that many of the lines are duplicates since a line running from Point A to Point D and a line running from Point D to Point A are the SAME line and should not be counted twice.

There are 9 red lines

As students discuss with their partners, **LISTEN** for students who have developed a **SYSTEMATIC way** to count the red lines. During the whole class discussion, **call on** these students to share their strategies rather than calling on students randomly.

NOTE: Our goal in Grade 5 is for students to develop reasoning and organized thinking in mathematics. In middle school, students will formally learn that lines connecting two vertices are called ***diagonals*** (regardless of the directional orientation). They will also be introduced to a mathematical formula used to calculate the number of diagonals. In THIS figure, there are 9 diagonals.

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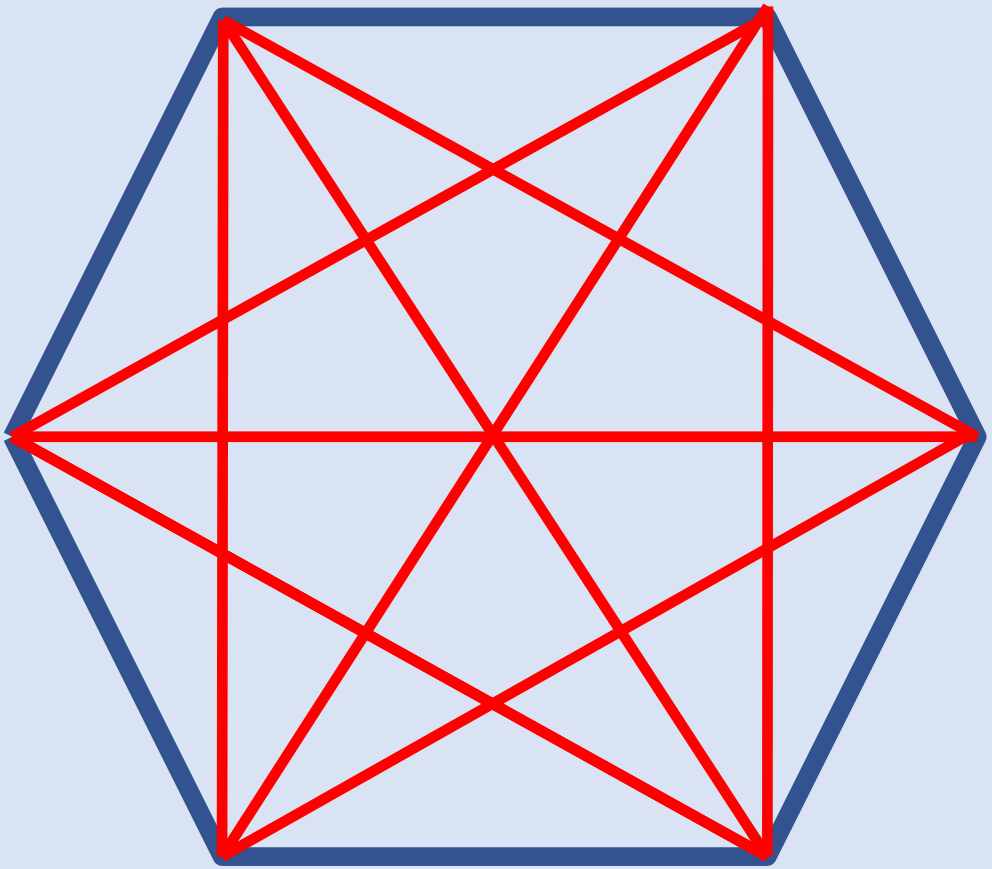
QUICK COUNT

What do you notice?

Day
118



QUICK COUNT

Calvert County
Public Schools

Day 118

QUICK COUNT

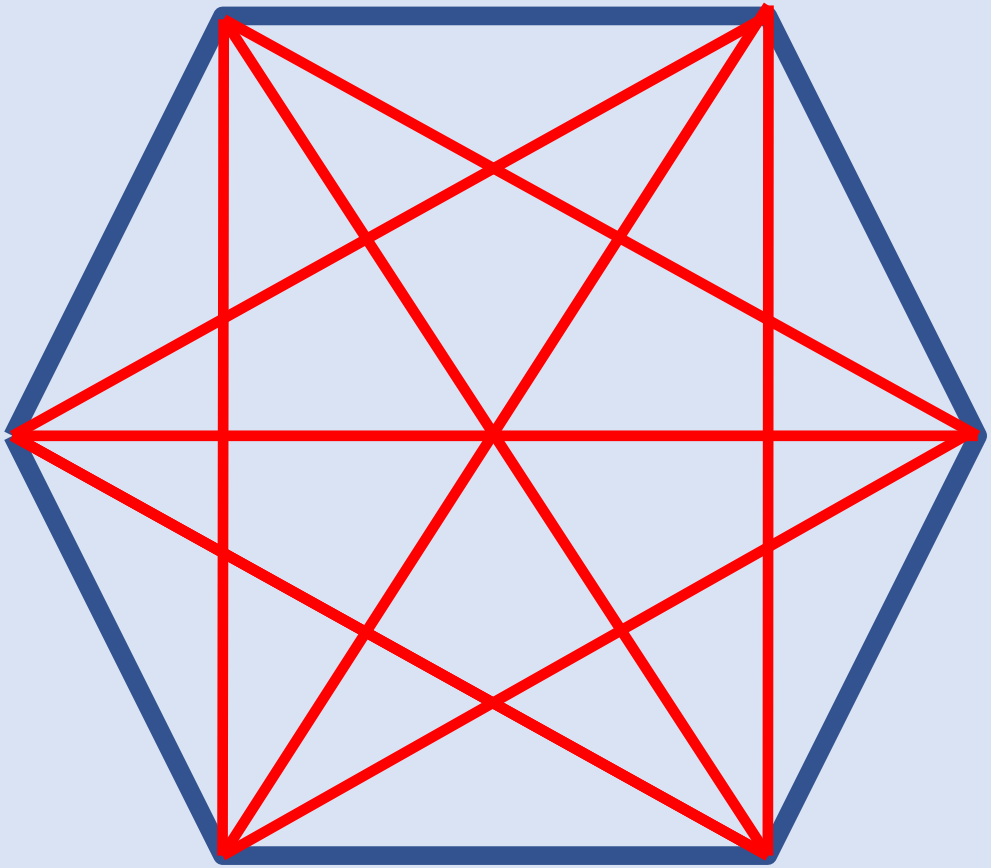
What did you NOTICE?

Calvert County Public Schools

Day 118

How many red lines?

Mentally calculate by **chunking**, **changing the form** and **connecting to math you know**.



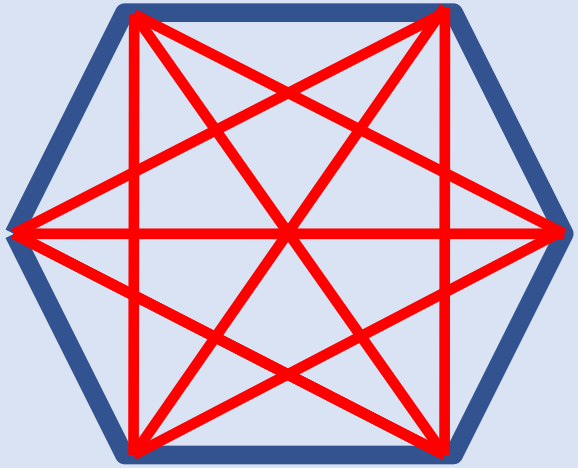
QUICK COUNT

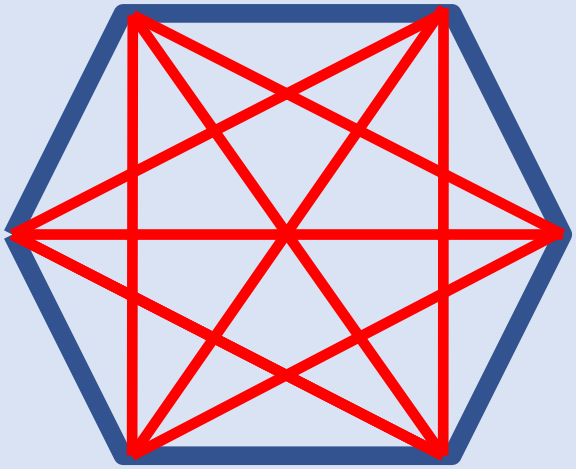
I noticed ____ so I _____

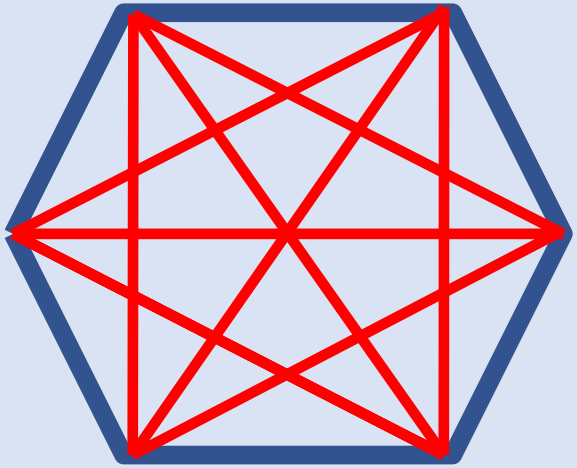
(They) noticed ____ so they___

Day 118

QUICK COUNT







Day 118

Reflect

What was mathematically important?

QUICK COUNT

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Day 119

SPLAT!

What number does this represent?

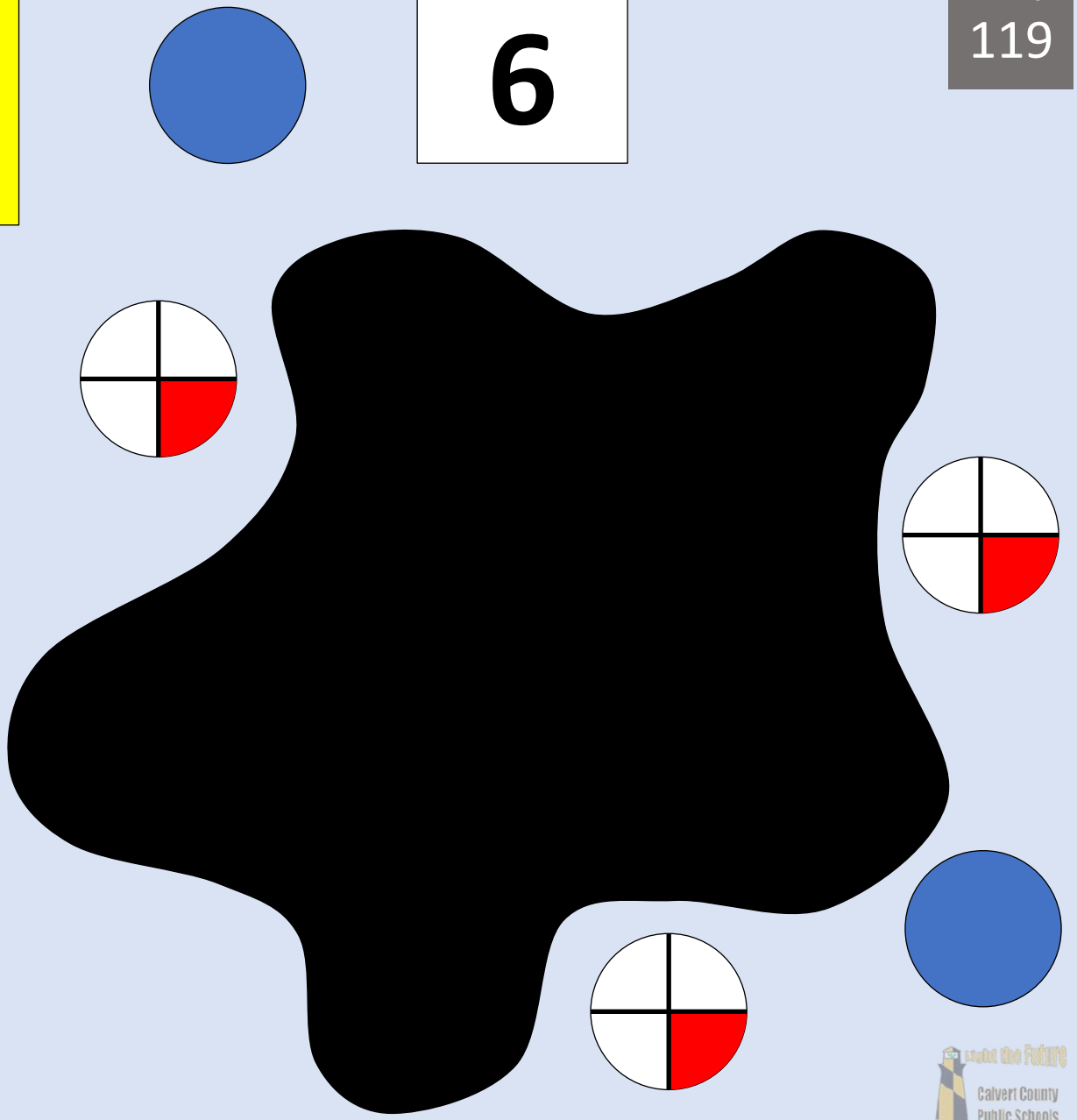
Splat!

What is the total under the splat?

How else could you know?

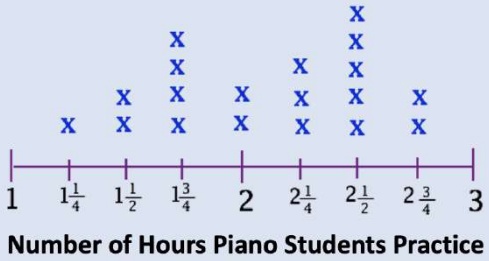
Let's look under the splat to see

What can we learn from this picture?



Steve Wyborney

Calvert County Public Schools



Number of Hours Piano Students Practice

TEACHER NOTES

Day 120

NUMBER TALK

BEFORE

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DURING

Adding and subtracting fractions (using number sense strategies) with unlike denominators

Possible reasonings:

- Students may recognize that the least two equal 2-3/4 which is the amount of the greatest so these subtract to a value of zero. Leaving the second greatest value as the difference (2-1/2)
- Some will add the two greatest (5-1/2) and the two least (2-3/4) and subtract (4-6/4 – 2-3/4 = 2-2/4 or 2-1/2)
- Some may subtract the least from greatest and second least from second greatest and add the differences
- Some will work with the whole numbers first, then will address the fractions separately

Annotating student thinking is critical!

Remember, students will come with a variety of strategies. During a Number Talk, the students explain their way of thinking. When students find ways that are especially efficient, highlight those strategies in the reflection that should follow the Talk. 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

Help students understand that some strategies are more efficient than others. Help them to also recognize shortcuts such as how the whole #s subtract to equal zero making it unnecessary to include them in this equation.

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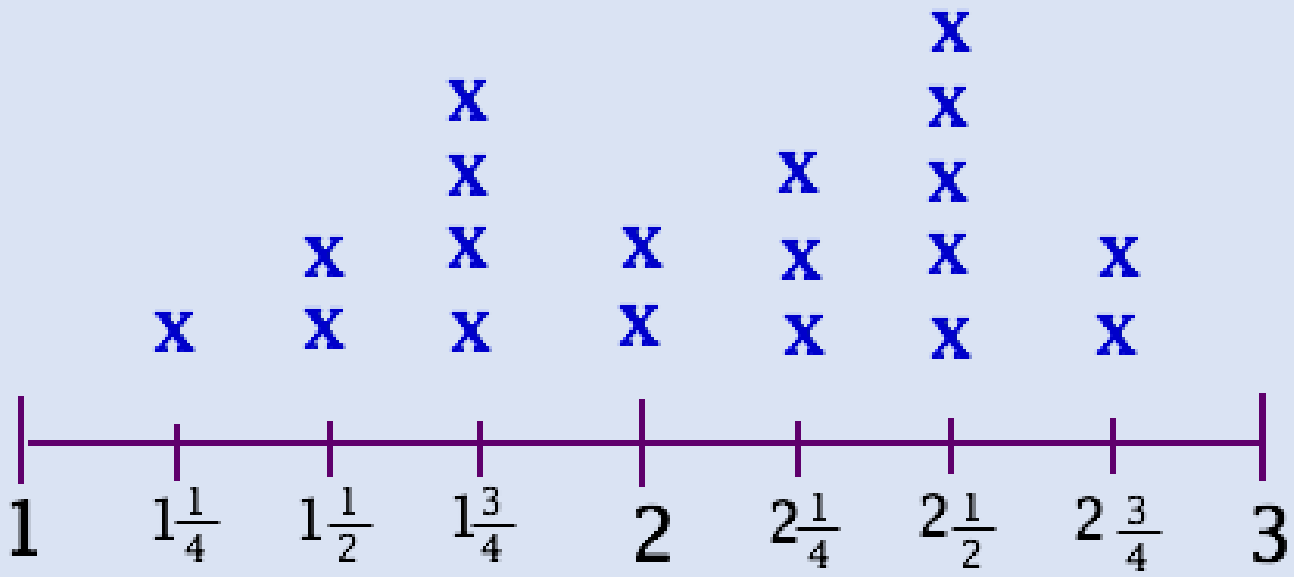
Day 120

What is the difference in hours between the two students who practiced the most and the two who practiced the least?

What strategy did you use to determine this?

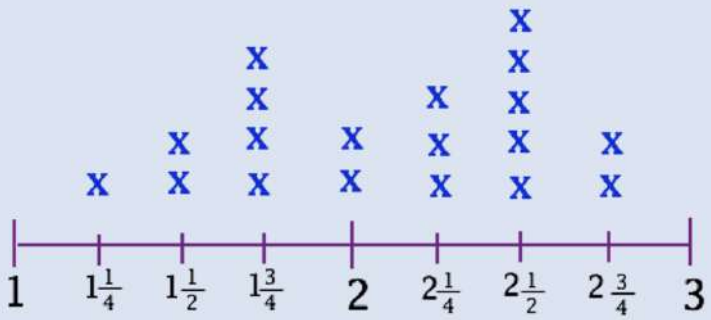


Number of Hours Piano Students Practice

NUMBER TALK

Let's Show Our Thinking

Day 120



Number of Hours Piano Students Practice

NUMBER TALK

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