Day 1 of this week has a step-by-step procedure for introducing Math Talks.

Double Ten Frames Dot Talks Objective: Students determine how many dots are on each of two ten frames and what the total number of dots is.	Day 1	
Description: These Math Talks ask students to determine the		
 total number of dots on a double ten frame without counting each individual dot. Students: develop their ability to subitize (quickly identifying the number of items in a small set without counting, for example "seeing" 4 dots as four without counting); use what they know about the 10 frame (for example, that 	Day 2	
there are 5 dots on each side); and find the total number of dots by counting on or making ten.	Day 3	
These Math Talks help students develop their mental fluency within 20 (2.OA.2). Strategies that students		
develop in these Math Talks will also be utilized as they build their understanding of addition of larger numbers with place value understanding. (Paper-and-pencil fluency with addition within 100 - 2.NBT.5)	Day 4	
More instructions are given in Day 1.		
The 2.0 Math Talks BLM has large versions of each of these double ten frame Math Talks. This video shows making 10 math talks on a double ten frame in action.	Day 5	

Below are the Math Talks suggested for this unit. These Math Talks are also listed with each lesson. **Use images from the Math Talks BLM.**

Engage with Current Content

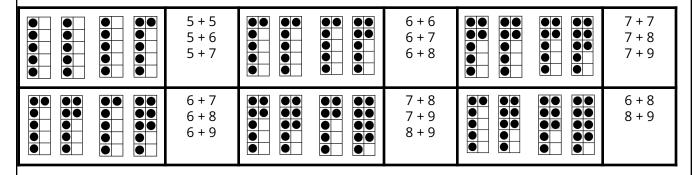
Double Ten Frames Dot Talks

Objective: Students determine how many dots are on each of two ten frames and what the total number of dots is.

Description: These Math Talks ask students to determine the total number of dots on a double ten frame without counting each individual dot. They build on the "making 10" talks from Unit 2.0. Students:

- develop their ability to subitize (quickly identifying the number of items in a small set without counting);
- use what they know about the ten frame (for example, that there are 5 dots on each side); and
- find the total number of dots using **doubles or near doubles.**

For more information, see Unit 2.0.



Adjust the number of dots as you see fit using the Double Ten Frame and Dot BLM.

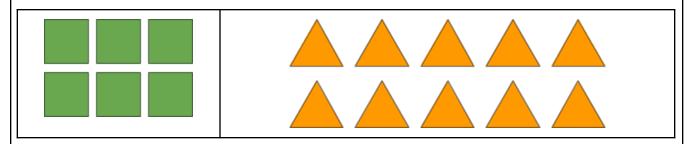
Arrays / Equal Groups

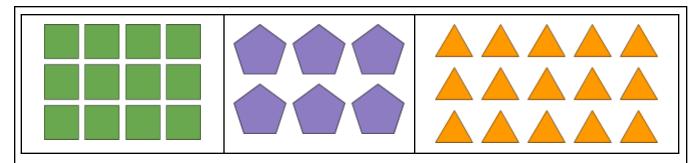
Objective: Students find the total number of objects in an array by thinking about skip counting or repeated addition.

Description: These Math Talks are designed to help students understand rows and columns and to apply skip counting and repeated addition.

Show an array and ask: How many objects (e.g., triangles) in this array? How do you know? How many rows? How many columns? How many altogether?

Rearrange the arrays and ask if students see the total a different way. Use fewer or more objects according to your students' needs.





Use images from the Math Talks BLM.

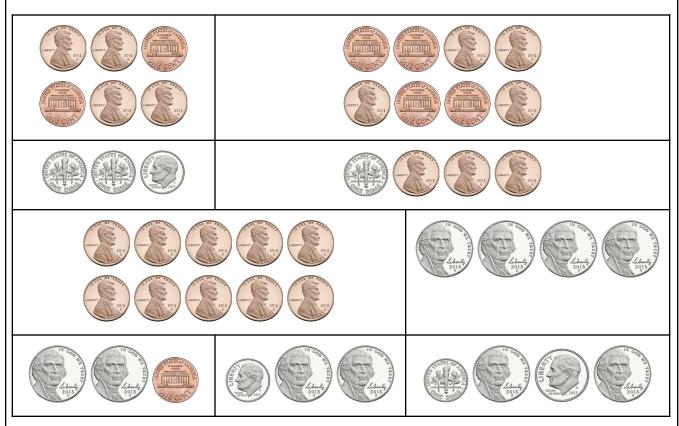
Identifying the Value of Coins and Combinations of Coins

Objective: Students identify the value of coins and combinations of coins.

Description: These Math Talks are designed to help students improve their ability to identify coins, remember their value, and find totals of multiple coins using skip counting and counting on. Vary the actual coins you use according to the needs of your students.

Show a set of coins and ask: *How many cents is this? How do you know?*

Rearrange the coins and ask if students see the total a different way. Use fewer or more coins according to your students' needs.

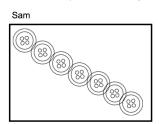


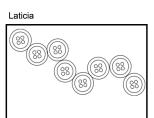
Use real coins or coin images from the Math Talks BLM.

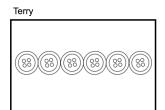
Below are the Math Talks suggested for this unit. These Math Talks are also listed with each lesson.

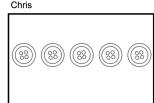
Engage with Current Content

Button Talk: Four students measured the length of a piece of paper. Which student has the most accurate method? Why? Use images from the Math Talks BLM.









Re-engage with Previous Content

Math Talks with Coins

Continue these from Unit 2.1. Emphasize the use of skip counting and counting on. Remind students that they can look at the class hundred chart or think of an open number line to help them.

Show a set of coins and ask: *How many cents is this? How do you know?*













If I have 3 dimes, and 12 pennies, how much money do I have?

If I have 2 nickels and ten pennies, how much money do I have?

Extension: Do I have enough money to buy an item that costs __ cents? If not, how much more do I need?

Use real coins or coin images from the Math Talks BLM.

Odd and Even

Is 20 odd or even? How do you know? If I start at 20 and count by 2s. will the numbers I count be odd or even? How do you know?

Is 9 odd or even? How do you know? If I start at 9 and count by 2s. will the numbers I count be odd or even? How do you know?

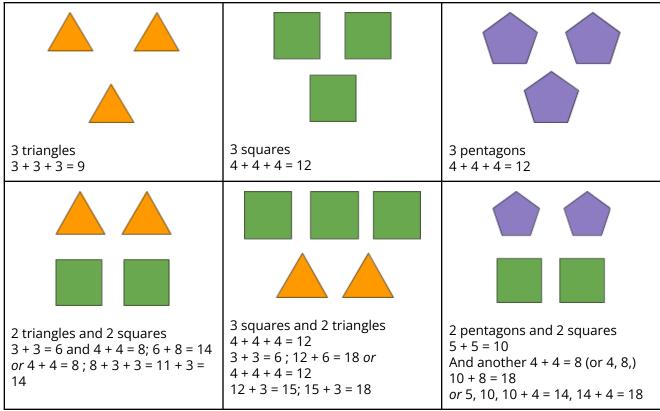
Is 10 odd or even? How do you know? If I start at 10 and count by 5s. will the numbers I count be odd or even?

Equal Groups / Repeated Addition with Geometric Subitizing

Geometric Subitizing uses group of shapes where the number of sides is easily recognized. Show cards quickly.

- Ask: How many shapes did you see? What are they?
- Then ask: How many sides does each shape have?
- And, finally: *How many sides altogether?*

Record student descriptions as equations. See sample responses below:



Continue to create cards with any combination of shapes. You can find images in the Math Talks BLM or use pattern blocks or other geometric shapes.

Extensions:

- Cover one shape, show the card, say the total number of sides. Ask: What shape am I covering?
- Say: My card has 14 sides, what could the shapes be?
- Ask: What shape must be on your card if you have an odd number of sides?

Adapted with permission from Math Talks developed by Graham Fletcher (https://gfletchy.com)

Engage with Current Content

Building Addition Fluency

Objective: Students practice different addition strategies.

Description: These Math Talks are designed to build student's fluency with addition within 20 and extend the techniques to larger numbers, building toward the three paper-and-pencil strategies that are the focus of this unit: **Adding by Place Value, Chunking,** and



Compensation.

Use the precise language of addition during these Math Talks and in the lessons:

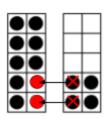
In Unit 2.0, students developed **making 10** strategies with double ten frames.

In this unit, students will **visualize** the double ten frames as they add two numbers by breaking one of them up to make ten with the other.

Return to using ten frames as needed. This video shows making 10 Math Talks on a double ten frame in action.

Our Addition Strategies

Making Tens
8 + 4 = 8 + 2 + 2
= 10 + 2 = 12



Making 10 number strings

making to na	maer acringa					
9 + 1 =	6 + 4 =	7 + 4 + 3 + 6 =	6+5+4+5=	15 + 5 =	17 + 3 =	11 + 9 =
9 + 1 + 4 =	6 + 4 + 3 =			25 + 5 =	17 + 23 =	21 + 9 =
9 + 5 =	6 + 7 =	2+7+8+3=	1 + 2 + 8 + 9 =	25 + 15 =	27 + 23 =	21 + 19 =
9 + 6 =	6 + 10 =			25 + 25 =		
	6 + 9 =	9+3+1+7=	4+4+6+6=			

In Unit 2.1, students solved **doubles and near doubles** problems, again with ten frames.

In this unit, students will **visualize** the double ten frames as they add doubles and near doubles.

Return to using ten frames as needed.

Using doubles

5 + 5 = 10 and 6 is one more than 5 So 5 + 6 = 11



Doubles and near doubles

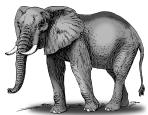
Doubles and near doubles							
5 + 5 =	6 + 6 =	7 + 7 =	8 + 8 =	9 + 9 =			
5 + 6 =	6 + 5 =	7 + 6 =	8 + 7 =	9 + 8 =			
5 + 4 =	6 + 7 =	7 + 8 =	8 + 9 =	9 + 10 =			

Engage with Previous Content

<u>Measurement</u>

Objective: Students choose a reasonable tool and unit to measure an object. Students find the length of an object on a broken ruler.

What would you use to measure the length of an elephant?



- a ruler?
- a meterstick?
- a tape measure?
- centimeters?
- inches?
- feet?
- meters?

What would you use to measure the length of a watermelon?



- a ruler?
- a meterstick?
- a tape measure?
- centimeters?
- inches?
- feet?
- meters?

What would you use to measure the length of a bicycle?



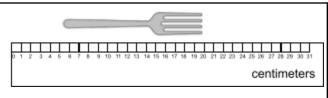
- a ruler?
- a meterstick?
- a tape measure?
- centimeters?
- inches?
- feet?
- meters?

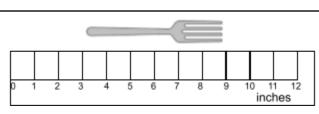
What would you use to measure the length of a fork?



- a ruler?
- a meterstick?
- a tape measure?
- centimeters?
- inches?
- feet?
- meters?

How long is it?





See images in the Math Talks BLM.

Below are the suggested Math Talks for this unit. Please see the Math Teaching Toolkit for more information. **2.4 Math Talks BLM**

There are two types of Math Talks suggested in this unit: Math Talks related to the content of this unit, **telling time**; and Math Talks related to the topic of the previous unit, **addition within 100**. You may choose to do more than one math talk per day, or alternate the clock talks with the addition talks. There are more than enough resources for you to continue to use these math talks in later units.

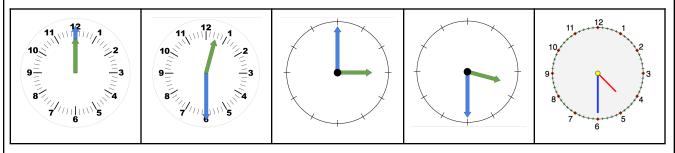
Engage with Current Content

Clock Talks

Objective: Students apply their knowledge of analog clocks to tell time to the nearest hour and half hour. **Description:** These Math Talks are designed to encourage students to reason about time and apply their understanding of how the hours are sequenced and positioned on a clock. These clock talks proceed in order of increasing difficulty. Gauge your students' interest and skill in order to decide how fast to move through them. Images are available in the 2.4 Math Talks BLM. Optionally, use an instructional clock or create your own clock talks from the Interactive Clock Face or No Numbers Interactive Clock Face.

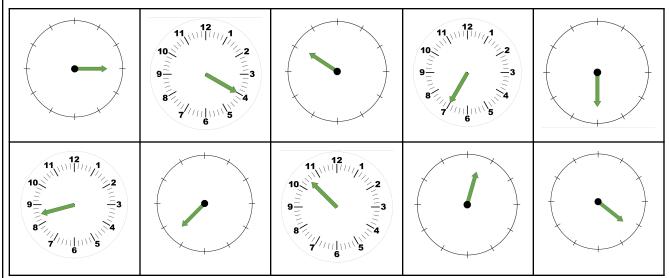
Hour and half hour (can be done with or without numbers)

What time is it? How do you know?



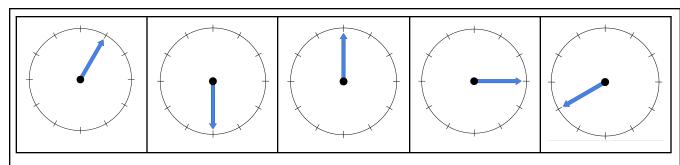
Hour hand only (can be done with or without numbers)

About what time is it? How do you know?

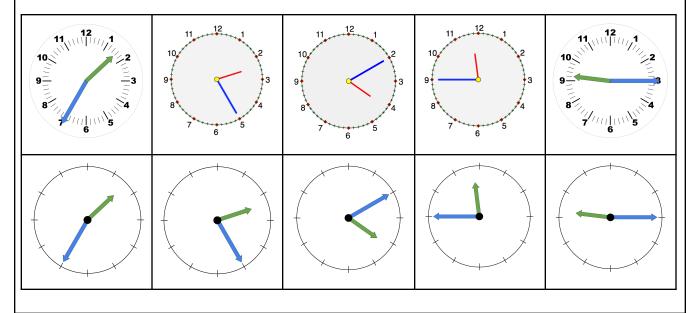


Minute hand only (can be done with or without numbers)

How many minutes after the hour? How do you know? How many minutes before the hour? How do you know?



Minute and hour hand (can be done with or without numbers) What time is it? How do you know?



Below are the suggested Math Talks for this unit. Please see the Math Teaching Toolkit for more information. See the Math Talk Visuals for images to show/project.

Engage with Current Content

Have a large hundred chart and open number line available to help students explain their thinking. Use the precise language of subtraction during these Math Talks and in the lessons:

minuend - subtrahend = difference

Students may solve these problems using strategies other than those named, and they should not be discouraged from this. But the choice of numbers lends itself to particular strategies.

Subtracting Tens

Objective: Students develop mental fluency subtracting tens.

27 – 20 =	63 – 20 =	49 – 20 = 49 – 30 =	Students might say: I know that skip counting backwards by 10 takes me down one number in the tens. 63, 53, 43. I thought of 6 base ten rods and 3 ones and took away 1 rod.
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Subtracting in Chunks

Objective: Students practice finding the difference between two numbers by taking away from the minuend one chunk of the subtrahend at a time.

get 29. To subtract 17, I take 10 more away - so 19.		33 – 8 =		36 – 17 =	Students might say: To subtract 7 from 36, I first thought of 7 as 6 + 1. Then subtracted the 6 to get 30. I had to subtract one more t
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Adding up to Subtract

Objective: Students practice finding the difference between two numbers by adding up from the subtrahend to the minuend and keeping track of the amount added.

30 – 19 =	40 – 24 =	70 – 34 =	32 – 28 =	Students might say: I know that 19 + 1 is 20, so 20 - 19 is 1. Since 19 + 1 is 20 and it's 10 more to 30, 19 + 11 = 30, so 30 - 11 = 19
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Subtraction Word Problems

Objective: Students solve word problems in a variety of contexts, applying subtraction strategies.

Visual Addition and Subtraction with Dots

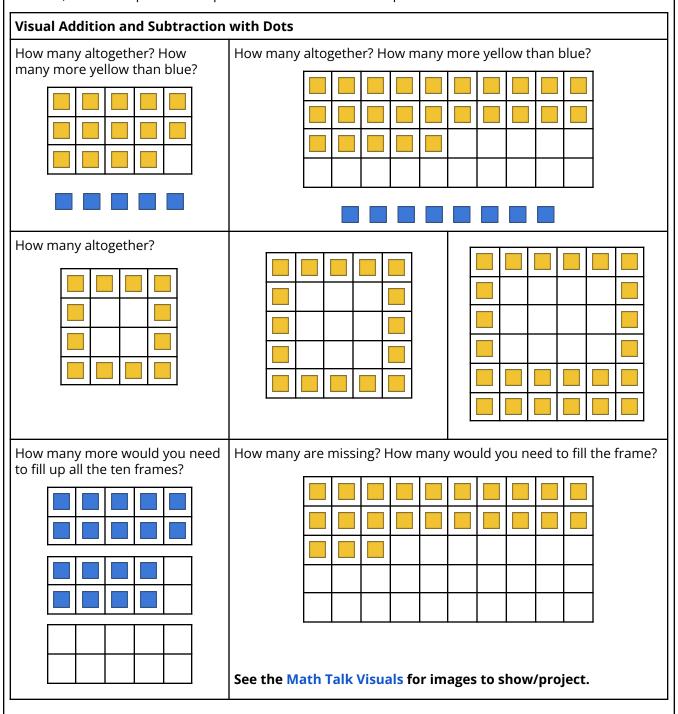
Objective: Students add or subtract dots in arrays and/or on grids and ten frames.

These Math Talks circle back to the standard students first encountered in Unit 2.1:

Operations and Algebraic Thinking

Work with equal groups of objects to gain foundations for multiplication.

2.0A.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 columns; write an equation to express the total as a sum of equal addends.



Math Talk Visuals for images to show/project.

Engage with Current Content

Equations with Unknowns: Students solve problems with unknowns in all positions. Since Math Talks are done without paper and pencil, it's important to keep the numbers within 20 or, if over 20, use friendly numbers. These are suggestions. Adjust numbers for your students as needed. The purpose is to build students understanding of the idea of an unknown and the relationship between addition and subtraction, while developing mental computation skills.

8 + ? = 10	? – 7 = 10	? – 7 = 11	18 – ? = 8	18 – ? = 8	5 = 20 - ?	17 = ? – 3	20 = 15 + ?
					6 = 20 - ?		
8 + ? = 12	? – 7 = 8	? – 5 = 11	18 – ? = 10	16 – ? = 8	7 = 20 - ?	15 = ? - 3	20 = 13 + ?
? + 8 = 12	? – 7 = 7	? – 4 = 11	18 – ? = 11	15 – ? = 8	8 = 20 - ?	14 = ? – 3	20 = 12 + ?

Engage with Previous Content

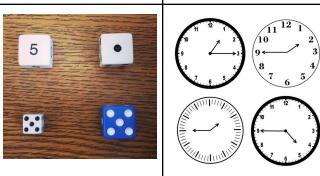
Which One Doesn't Belong: Students look at four images (of numbers, coins, or shapes) and compare their attributes. These Math Talks have many different solutions. Students can argue for any of the four not belonging, but their reasoning must be justified. For more "Which One Doesn't Belong" Math Talks, visit: http://wodb.ca/shapes.html

Display the image and ask Which one doesn't belong? Why?



Math Talk Visuals are here.

Credits: Puzzles from www.wodb.ca and used with permission of Mary Bourassa and Andrew Gael.



Math Talk Visuals are here.

Engage with Current Content

Which is Greater?

Students decide if two qu	antities are equal or if one i	s greater than the other by rea	soning.
2 tens + 5 ones	6 ones + 2 tens	1 ten + 7 ones	17 ones
1 hundred + 5	tens + 3 ones	1 hundred + 3 tens	s + 5 ones
3 hundred + 5 tens	3 hundred + 5 ones	5 hundred + 2 tens	502

Number Lines: What's the Number?

Students name a missing number and justify their reasoning.

Question: What could the number be?	Sample responses:
◆	I think it's 150 because it's between 100 and 200.
100 200	But it's not half way - it's closer to 100. So I think it is 140,
300	100

Number Lines: Where do they go?

These math talks give students opportunities to: Compare numbers to decide **where** they go relative to each other on the number line; reason about how far apart they go relative to each other on the number line; and reason about the scale of the number line and what benchmark numbers to include

Present the number lists all at once, or by revealing one number at a time. As each new number is added, ask students where it goes, how they know, and how the numbers placed so far need to be adjusted. The focus is on approximate placement, justification, and developing number sense. A class number line can be made on a board or can be a permanent fixture of the classroom. Hanging numbers on a string with clothespins makes it easy to move numbers around.



Ask: Where does each number go? How do you know? What benchmark numbers can help you? Does that change where the other numbers go?

Place the numbers: 25, 28, 75, 78, 102, 50 Place the numbers: 100. 200. 500. 140. 170 Place the numbers: 600, 700, 650, 660, 655

Sample discussion: Students might initially put the 100 and 200 far apart but then will need to put them closer together relative to the 500.

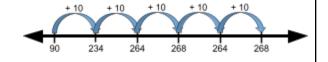
Engage with Current Content - Number Strings

For each number string, students may justify their thinking with a combination of:

- Patterns (e.g. when I add ten, the tens goes up by one)
- Showing on the class 1000 chart
- Showing on a number line

Reflection questions:

- What patterns helped you? What patterns do you see?
- How are the different ways of thinking about this similar? How are they different?



Fluency with ad	ding ones leading	to fluency with	adding tens and l	nundreds:	
7 + 5 70 + 50 700 + 50	7 + 5 77 + 5 707 + 5 7 + 55	8 + 6 80 + 60 800 + 60	8 + 6 88 + 6 88 + 60 88 + 66	9 + 5 90 + 50 99 + 50 99 + 150	8 + 9 80 + 90 88 + 90 88 + 190
Patterns when a	adding tens:		Patterns when s	subtracting tens:	
62 + 10 162 + 10 262 + 10	35 + 10 135 + 10 235 + 10	170 + 10 170 + 20 177 + 10	62 – 10 162 – 10 262 – 10	35 – 10 135 – 10 235 – 10	170 – 10 170 – 20 177 – 20
Patterns when adding hundreds:			Patterns when subtracting hundreds:		
7 + 100 70 + 100 77 + 100 700 + 100 707 + 100 777 + 100	4 + 100 40 + 100 44 + 100 40 + 200 40 + 300 44 + 200	18 + 100 180 + 100 188 + 100 188 + 200 288 + 100 288 + 200	400 - 100 440 - 100 444 - 100 400 - 200 440 - 200 444 - 200	500 - 100 550 - 100 555 - 100 500 - 200 550 - 200 555 - 200	600 - 100 600 - 200 613 - 100 613 - 200 613 - 110 613 - 210
Patterns when a	adding tens and h	undreds:	Patterns when subtracting tens and hundreds:		
28 + 10 28 + 110 28 + 120 280 + 110	87 + 10 87 + 110 187 + 110 187 + 120	45 + 10 45 + 110 450 + 10 450 + 110	380 - 10 388 - 10 388 - 110 388 - 120	145 – 10 145 – 110 145 – 120 145 – 130	222 - 10 222 - 110 222 - 120 222 - 130
Patterns when adding across hundreds:			Patterns when subtracting across hundreds:		
180 + 10 180 + 20 180 + 30 180 + 40	185 + 10 185 + 20 185 + 30 285 + 30	150 + 50 150 + 60 150 + 70 155 + 50	120 - 10 120 - 20 120 - 30 120 - 40	326 - 10 326 - 20 326 - 30 326 - 40	326 - 110 326 - 120 326 - 130

Math Talk Visuals BLM

Engage with Current Content

Which One Doesn't Belong?

Objective: Students observe different visual images and observe and compare attributes

Description: Students look at four images (of numbers, coins, or shapes) and compare their attributes. These Math Talks have many different solutions. Students can argue for any of the four not belonging, but their reasoning must be justified. For more "Which One Doesn't Belong" Math Talks, visit: http://wodb.ca/shapes.html

Display the image and ask Which one doesn't belong? Why?

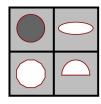








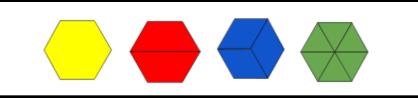




Some images from wodb.ca. Used with permission of Mary Bourassa and Isabelle Bourassa.

Notice and Wonder

Display the images and ask What do you notice? What do you wonder?



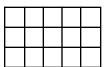
Partitioning Rectangles



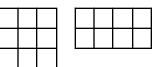
Grandma made a pan of brownies for Jake's birthday. There will be six

people sharing the brownies. How can Jake cut the pan up evenly into 6 equal pieces so everyone gets an equal share?

How many squares do you see? How do you know?



How are these rectangles the same? How are they different?



How many squares are green? How many are blue? How many squares altogether?



Equal Shares

Melissa and her friend want to share a pizza. How can they cut it up so they both get the same amount?

Melissa, Mia, Mary, and Mark want to share a pizza. How can they cut it up so they all get the same amount?

Pablo, Peter, and Perry want to share a pizza. How can they cut it up so they all get the same amount?

Math Talk Visuals

Engage with Previous Content

Fraction Math Talks

What do you notice?

What fraction of the shape is blue? Green? Light orange? Dark orange? Orange?







Engage with Current Content			Sample responses		
Making ten 18 + 16 28 + 26 25 + 29 35 + 39 45 + 19		25 + 29 35 + 39	18 + 16 • 18 + 2 + 14 = 20 + 14 = 20 + 10 + 4 = 30 + 4 = 34 • 18 + 16 = 16 + 18 16 + 18 = 16 + 10 + 4 + 4 = 26 + 4 = 30 + 4		
Decomposing a number leading to a ten or using the relationship between addition and subtraction			23 - 14 • 23 - 14 = 23 - 10 - 3 - 1 = 13 - 3 - 1 = 10 - 1 = 9 • 23 - 14 = 23 - 7 - 7 = 23 - 3 - 4 - 7 = 20 - 4 - 7 = 16 -		
23 - 14 33 - 14	52 - 14 42 - 14 42 - 24	27 - 8 27 - 18 37 - 18	7 = 16 - 6 - 1 = 10 - 1 = 9 • I know that 14 + 6 = 20 and 20 + 3 = 23 so I add 6 and 3 to get 9		

Math Talks with Money: What is the total? Which is less? How much less?

• Show coins from the Math Talks Visuals BLM and have students find totals and/or compare values

What is the total?



Which is more? How much more? How do you know?





Word Problems to develop students facility with the unknown problem types and mental computation

Yesterday there were 22 students in class. 8 were boys. How many were girls? Were there fewer boys or girls? How many fewer? How many more would be needed to get to 25?

- I know that I need to find the number that you add to 8 to make 22. 8 + 2 = 10, another 10 makes 20, and another 2 makes 22. 2 + 10 + 2 = 14
- If I subtract the number of boys from the number of students, I'll get the number of girls. 22 8 = 22 2 6 = 20 6 = 14.

There were 15 kids on a bus. At the next stop more kids got on. Now there are 25 kids on the bus. How many kids got on the bus?

Marcus rode his bike for 3 days. He rode a total of 14 miles. On Saturday he rode 7 miles, he rode some more on Sunday, and on Monday he rode 4 miles. How many miles did he ride on Sunday?

Every day, Tanya walks a mile to school and a mile home. On Wednesday, she walked to school but got a ride home. How many miles did she walk to and from school this week?

Ben has 6 red and 6 blue marbles. Tim has 15 marbles. Who has more? How many more?

There are 15 desks in our room and 13 in the room next door. Which room has fewer? How many?

Domino Math Talks





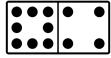




How many dots? How do you know?

Students might say:

• I combined the 6 dots with the 4 to make one 10; the 5 with the 2 and 3 to make another 10, and that left 4 dots. 10 + 10 + 4 = 24







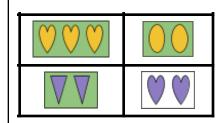


Math Talk Visuals are here S C.

Engage with Previous Content - Which one doesn't belong? Why?

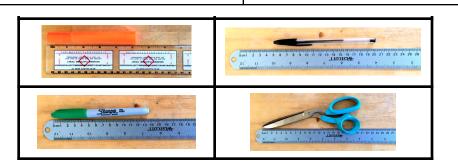


15 + 15 = 30	4 + 1 = 5
13 + 14 = 27	23 + 24 = 47





From wodb.ca. Used with permission of Erick Lee.



Engage with Current Content - What do you notice? What do you wonder?

Favorite Pets		
Pet	Tally Marks	Number
	# #	10
3		4
	# 1	6

