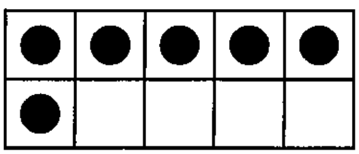
5 Math Terms to Know {for Primary Families}

Below are a group of terms and phrases you'll hear throughout the year. These five mathematical concepts (ten frame, subitizing, 120s chart, number sense, place value) are integrated throughout each unit we teach and are year-long skills we will hone.

Ten Frame

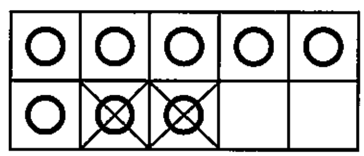
a structured way to work with numbers within 10

WHY? {Develops mental-math abilities and sets foundation for regrouping. 10 frames allow students to each group and see numbers.}



___ + 6 = 10

10 = 6 + ___



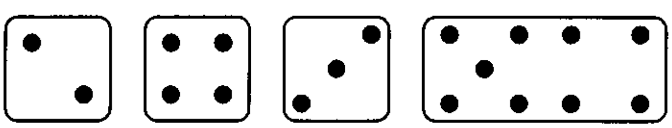
8 - 2 = ___

___ = 8 - 2

Subitizing

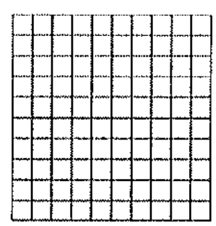
the ability to quickly identify the number of items in a small set without counting

WHY? {Subitizing helps students create a mental picture & builds number sense.}



120s Chart

a number line formatted so students can easily identify number patterns



{Understanding the 120s Chart allows students to see patterns within number sequences, as well as, easily work with 10 more/less, 1 more/less. Creates automaticity with numbers.

Number Sense

an understanding of number relationships that allows students to work mathematical problems without a traditional algorithm

WHY? {A solid understanding of numbers allows students to conceptualize numbers – What is 10 less/more? Which number is greater/less than? What happens if I double a number? What does a ten look like?}

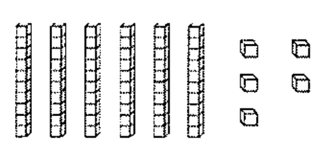
Place Value

numerical value of a digit based on its position

WHY? {Place value allows students to understand that 15 is not a "1" and a "5"; rather, it is a group of 10 and 5 ones.}

H	T	O
0	6	5

} 65

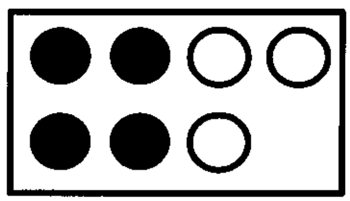


Subitizing Numbers

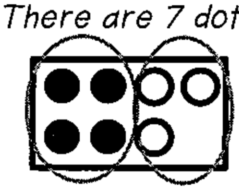
Subitizing is the ability to quickly and accurately identify the number of objects in a small set. Quick identification of a number-group means that students aren't counting objects one-by-one. Additionally, subitizing is an important foundation for breaking apart numbers and understanding all numbers can be broken apart in different ways.

What does Subitizing look like?

Teacher: What do you see when you look at this dot pattern?

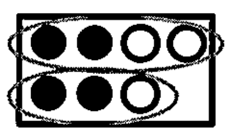


Student 1: *I see 4 black dots and 3 white dots. There are 7 dots.*



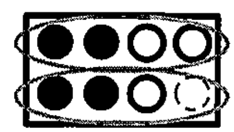
$4 + 3 = 7$

Student 2: *I see 3 dots on bottom and 4 dots on top. There are 7 dots.*



$3 + 4 = 7$

Student 3: *I see 2 rows of 4 dots but the second row has 1 less.*



$4 + 4 = 8$
$8 - 1 = 7$

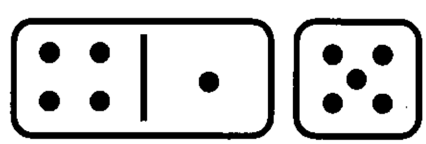
Note – When we first look at dot patterns we only talk about what we see. We do not write any number sentences about the picture. After we are comfortable seeing dot patterns, we will begin sharing our ideas and connecting them to addition and subtraction sentences.

Why is this strategy important?

Subitizing sets the foundation for decomposing (or breaking apart) numbers. It shows students that sums are made of many different number combinations. When students listen to others ideas about 'seeing' a number, it teaches them that there are many ways to find an answer in math and that's okay. Students learn to 'talk math' when they share their ideas about dot patterns.

How can I support this strategy at home?

Play a game of dominoes or a board game with dice (Yahtzee is a fabulous choice). Take turns quickly shouting out the numbers on the dice or dominoes. Then, match dominoes or dice that have the same sums.



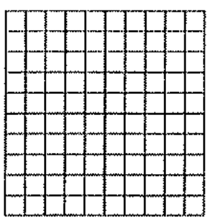
120 Chart & Place Value

Place Value helps set the foundation for addition and subtraction as students are able to identify number relationships on the 120s chart. Then, we start building two-digit numbers using tens and ones. This progresses into ordering and comparing numbers.

I can read & write numbers to 120.

120s Chart

a number line formatted so students can easily identify number patterns



Understanding the 120s Chart allows students to see patterns within number sequences, as well as, easily work with 10 more/less, 1 more/less. This creates automaticity with numbers.

67	68	69	70
77	78	79	80
87	88	89	90
97	98	99	100

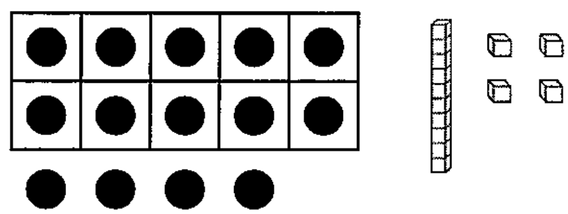
For example, students will learn 100 has 1 more one than 99, so it is just to right of 99 on the chart. 100 has 1 more ten than 90, so it is just below 90 on the chart.

I can show numbers as tens & ones.

Place Value

numerical value of a digit based on its position

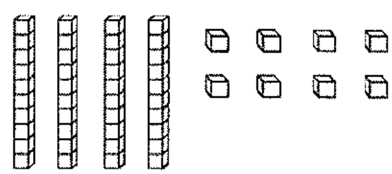
WHY? Place value allows students to understand that 14 is not a "1" and a "4"; rather, it is <u>composed</u> of a group of 10 and 4 ones.



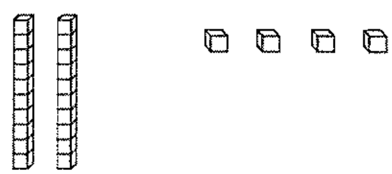
I can compare numbers (<, >, =).

Which number is <u>greater</u>?

48



24



48 is greater than 24.

48 > 24

Students understand that the number with more tens is the greatest number. Should a number have the same amount of tens, students then compare the ones.

I can order numbers using place value.

Place these numbers in order from <u>least</u> to <u>greatest</u>.

64 81 57 36

36 57 64 81

Place these numbers in order from <u>greatest</u> to <u>least</u>.

72 31 28 49

72 49 31 28

Addition Strategies

Learning a variety of addition and subtraction strategies. We will model addition strategies that will transition into mental-math strategies. Students are exposed to all strategies but are encouraged to choose the strategy that works best for them and the math problem. Students will use these strategies to solve number stories.

Commutative Property

(adding numbers in any order)

$4 + 5 = 9$

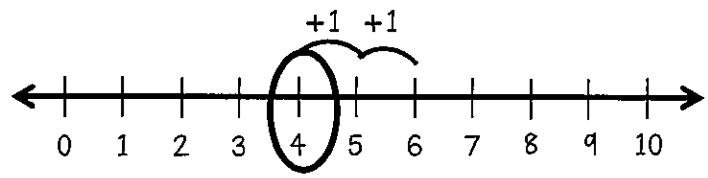
is the same as

$5 + 4 = 9$

Students will understand that even when addends (numbers being added) trade places, the sum (total) remains the same.

Counting On

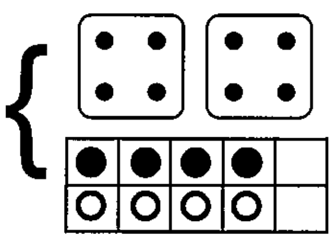
$2 + 4 = 6$



Students can count on when adding 1, 2, or 3 starting with the largest addend.

Doubles

$4 + 4 = 8$



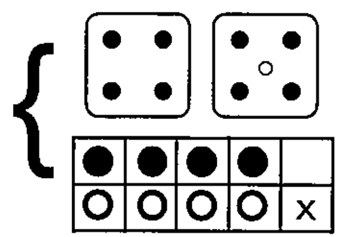
Research shows that many children remember double facts more easily than other facts with sum within 20. Using doubles moves students beyond counting to develop efficient addition strategies.

Near Doubles

$4 + 4 = 8$

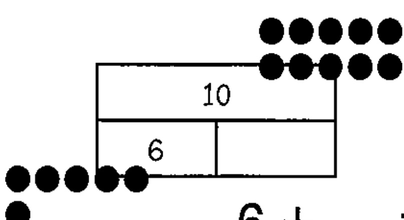
so, I know...

$4 + 5 = 9$



A near-doubles fact is a doubles fact plus or minus one. When students know both doubles and counting on/back fluently, they can solve near doubles mentally.

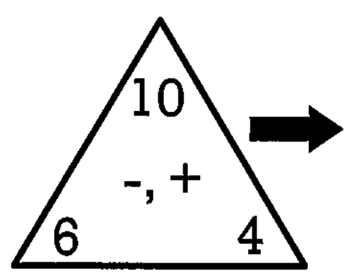
Missing Addends



6 + __ = 10

Students will use a related fact to find the unknown number. Missing addends allow students to make algebraic connections between numbers.

Fact Families



$6 + 4 = 10$
$4 + 6 = 10$
$10 - 4 = 6$
$10 - 6 = 4$

Fact families are made up of four related facts in which the same three numbers are used in two addition and two subtraction equations.

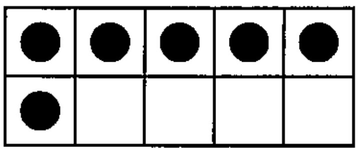
Addition Strategies

Learning a variety of addition and subtraction strategies. We will model addition strategies that will transition into mental-math strategies. Students are exposed to all strategies but are encouraged to choose the strategy that works best for them and the math problem. Students will use these strategies to solve number stories.

Ten Frame

a structured way to work with numbers within 10

WHY? { Develops mental-math abilities and sets foundation for regrouping }



____ + 6 = 10

10 = 6 + ____

Number Stories

Matt has 6 baseballs in his room. Carson has 4 baseballs in his toy box. How many baseballs do Matt and Carson have altogether?

Students will learn addition strategies in context through number stories (i.e. story/word problems). Providing context allows students to make real-world connections.

Addition of 3 Addends

Students will add 3 numbers by combining various addition strategies based on the addends given.

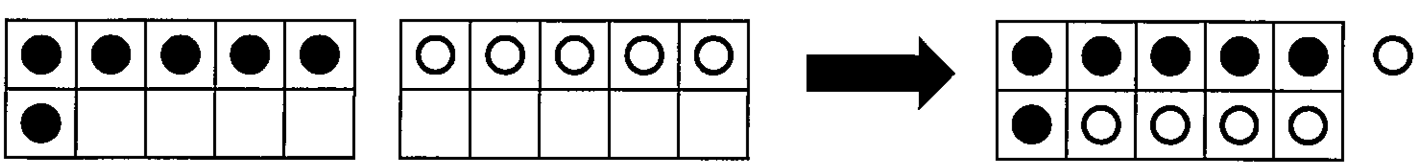
$$3 + 7 + 3 = ?$$

Student 1	Student 2
First, I added 3 and 7 because I knew they made 10. Then, I counted on 3 more. 10 → 11 → 12 → 13	I knew my doubles fact 3 + 3 was equal to 6. Then, I had 6 + 7 which I know is a near double. So, 6 + 6 = 12 plus one more is 13.

Making 10 to Add

As students learn to make a 10, it gives them a foundation when adding. Base 10 becomes a 'safety' when students aren't sure where to start. Plus, base 10 becomes especially important when learning about decimals, percentages, and exponents in intermediate grades!

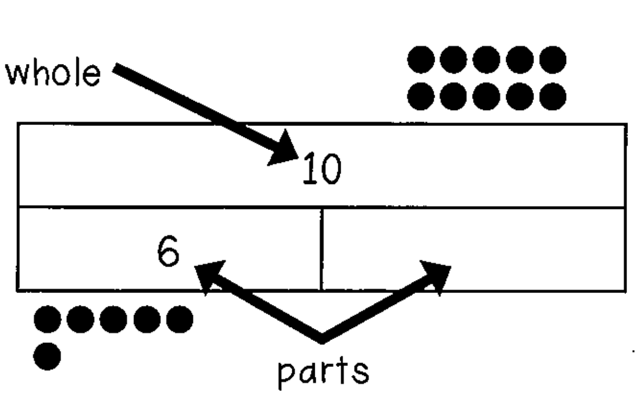
6 + 5 is the same as 6+4+1 or 10+1

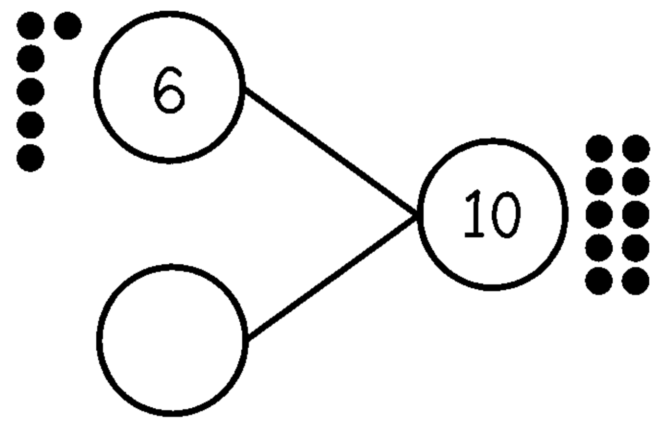


Part, Part, Whole

Part, Part, Whole is a strategy in which students see a number is made of two parts. When students are given a part, part, whole diagram, they're looking for a missing number. Part, part, whole encourages students to ask – "How are these numbers related to one another?"

What does Part, Part, Whole look like?





6 + ? = 10

10 - 6 = ?

? + 6 = 10

10 - ? = 6

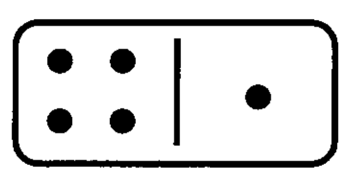
Why is this strategy important?

Eventually, breaking apart numbers (decomposing) will become a mental strategy. As students become pros at decomposing numbers, this skill will translate to other mathematical processes such as adding, subtracting, and finding missing addends (a precursor to algebra). Traditional "fact families" also stem from the concept of part, part, whole.

How can I support this strategy at home?

Play a game of dominoes. Consider the domino as 2 parts. Challenge your child to find the whole. As you continue playing, try finding other dominoes that match that whole.

(4+1=5, 3+2=5, 0+5 =5, 6−1=5)



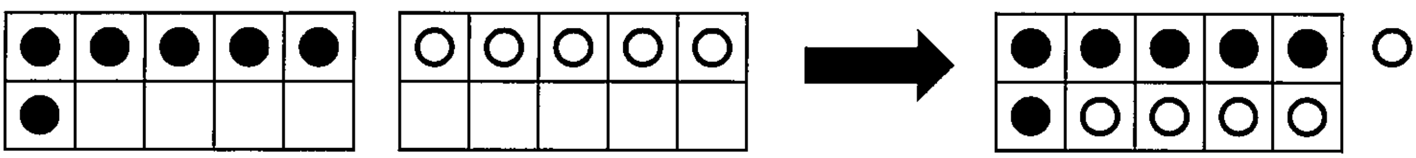
Making 10 to Add

Making 10 to Add is one of the most important skills we will build this year and it is a skill that often frustrates families. Initially when teaching students to add using 10, it is manipulative-based and done with ten-frames. Eventually, it will become a mental process for students. As adults, making 10 is a completely mental and intuitive process (because we've had many years of practice), so breaking the numbers down this way can seem cumbersome. Consider - if you did **not** have a calculator or a pencil, how would you add 35 and 45? Would you add the two 5s to make 10 and then, add 30 + 40 to make 70? Ultimately adding 10 + 70 to get 80? If so, you've unknowingly made a 10 to add!

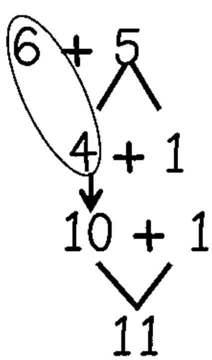
What does Making 10 to Add look like?

*<u>Foundation 1</u>: As students are just learning to make 10, we use 10 frames to make our learning hands-on and 'real'.

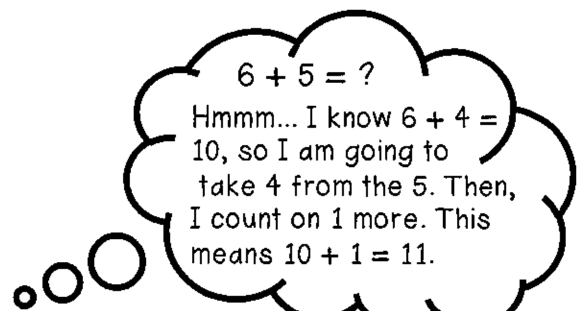
6 + 5 is the same as 6+4+1 or 10+1



*<u>Foundation 2</u>: As students gain confidence in breaking-apart numbers, we'll move to numerical representations.



*<u>Foundation 3</u>: Eventually, making 10 to add becomes a mental process that is natural and intuitive to students.



Why is this strategy important?

As students add double-digit numbers, making 10 gives students a go-to strategy for breaking apart numbers.

17 + 24 = ?

Hmmm... I know 10 + 20 = 30, leaving me 7 + 4. I know 7 + 3 = 10, plus 1 left over. So, 30 + 10 + 1 = 41.

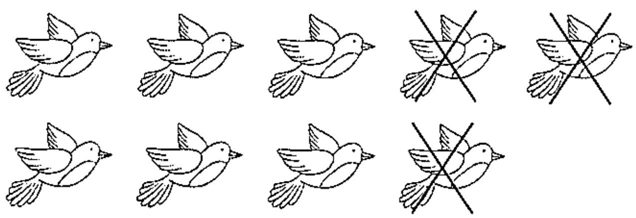
As students learn to make a 10, it gives them a starting place when adding. Base 10 becomes a 'safety' when students aren't sure where to start. Plus, base 10 becomes especially important when learning about decimals, percentages, and exponents!

Subtraction Strategies

{ Learning a variety of subtraction strategies, we will model strategies that will transition into mental-math strategies. Students are exposed to all strategies but are encouraged to choose the strategy that works best for them and the math problem given. Students will use these strategies to solve number stories. }

Draw a Picture

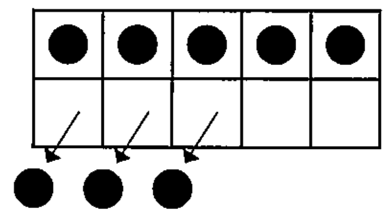
9 - 3 = ____



Before students have a variety of strategies to choose from, they may choose to draw a picture or counters to show their thinking.

Ten Frame

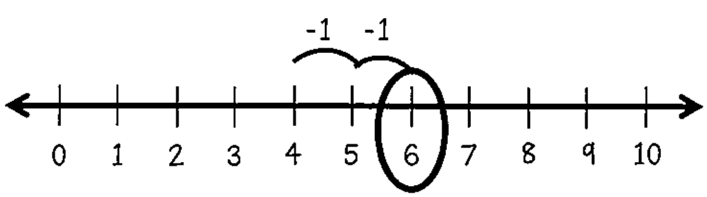
8 - 3 = ____



I know that 8 minus 3 is the same as 5.

Counting Back

__6__ - __2__ = __4__



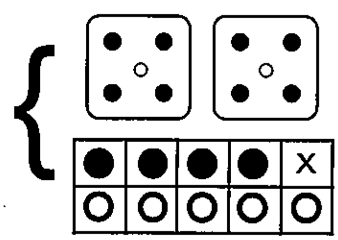
Students can count back when subtracting 1, 2, or 3 starting with the largest subtrahend.

Near Doubles

5 + 5 = 10

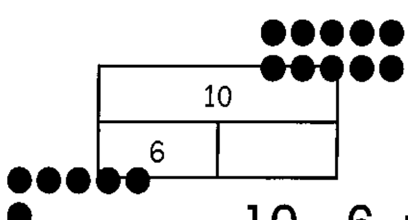
so, I know...

4 + 5 = 9



A near-doubles fact is a doubles fact plus or minus one. When students know both doubles and counting on/back fluently, they can solve near doubles mentally.

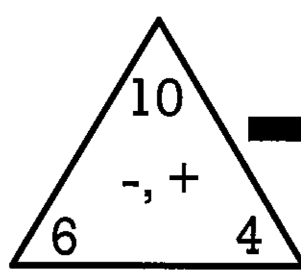
Missing Addends



10 - 6 = __

Students will use a related fact to find the unknown number. Missing addends allow students to make algebraic connections between numbers.

Fact Families



6 + 4 = 10
4 + 6 = 10
10 - 4 = 6
10 - 6 = 4

Fact families are made up of four related facts in which the same three numbers are used in two addition and two subtraction equations.

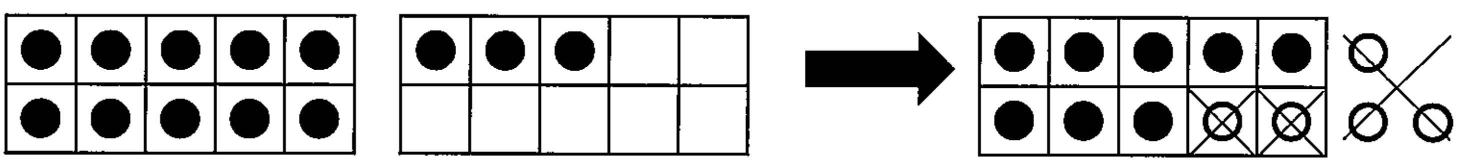
Making 10 to Subtract

Making 10 to Subtract is one of many subtraction strategies students will learn this year and it is a skill that often frustrates families. Initially when teaching students to subtract using 10, it is manipulative-based and done with ten-frames. Eventually, it will become a mental process for students. As adults, making 10 is a completely mental and intuitive process (because we've had many years of practice), so breaking the numbers down this way can seem cumbersome. Additionally, Making 10 to Subtract is a strategy many students will naturally gravitate towards while other students may prefer another strategy (and that is okay!).

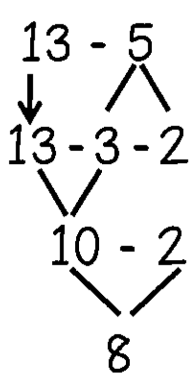
What does Making 10 to Subtract look like?

*<u>Foundation 1</u>: As students are just learning to make 10, we use 10 frames to make our learning hands-on and 'real'.

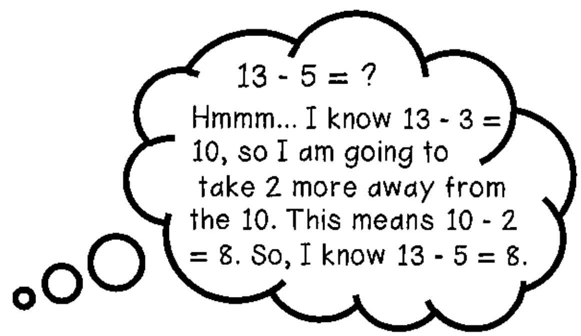
13 - 5 is the same as 13 - 3 - 2 = 8



*<u>Foundation 2</u>: As students gain confidence in breaking-apart numbers, we'll move to numerical representations.



*<u>Foundation 3</u>: Eventually, making 10 to subtract becomes a mental process that is natural and intuitive to students.



Why is this strategy important?

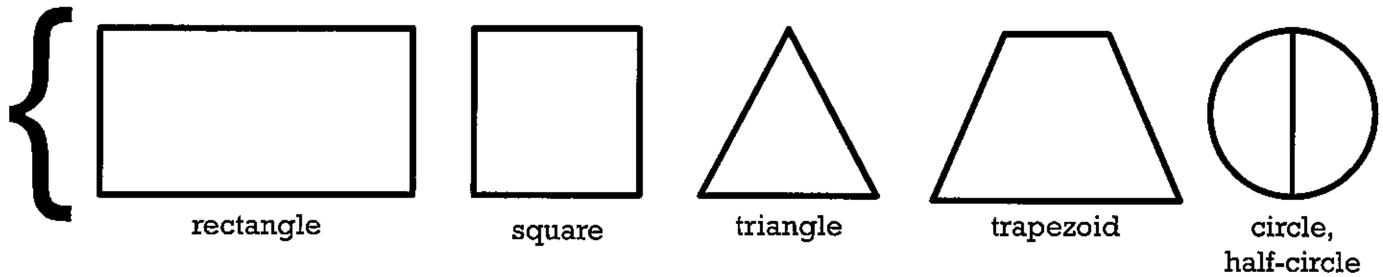
As students learn to make a 10, it gives them a starting place when adding and subtracting. Base 10 becomes a 'safety' when students aren't sure where to start. Plus, base 10 becomes especially important when learning about decimals, percentages, and exponents!

Geometry

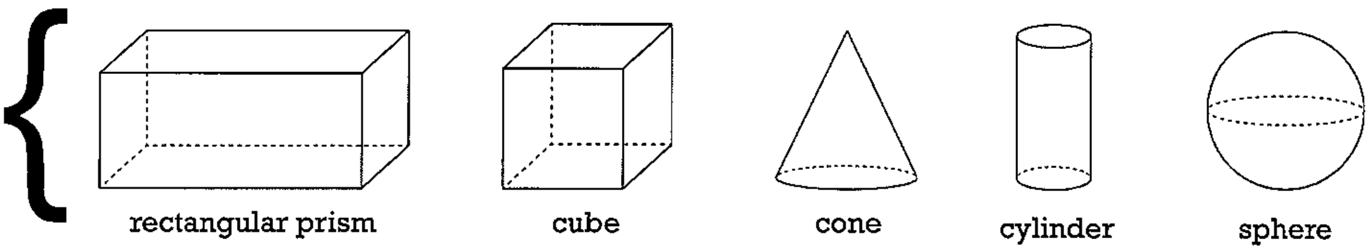
Geometry is the study of shapes. In this unit, students will build and describe shapes. In 1st grade we have moved beyond identifying shapes and will spend time observing shapes (in the abstract and in the real world). Additionally, we will describe and compare these shapes.

Shapes We Learn With in 1st Grade

2D/Flat Shapes

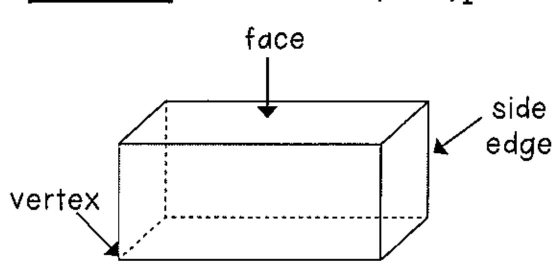


3D/Round Shapes



I can describe a shape.

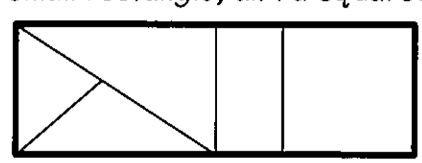
Shapes can be described using defining attributes and non-defining attributes. **Defining attributes** include sides, faces, vertices, open/closed. **Non-defining attributes** include color, size, position.



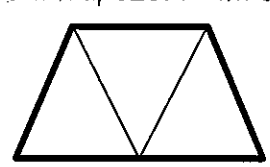
Student: This is a rectangular prism. It is a 3D shape with 6 faces – 2 square faces and 4 rectangular faces. It has 12 edges and 8 vertices.

I can make composite shapes.

From a rectangle, I can make 3 triangles, a small rectangle, and a square!



I can make a trapezoid with 3 triangles!



WHY? Building shapes from other shapes builds abstract thinking and spatial reasoning skills.