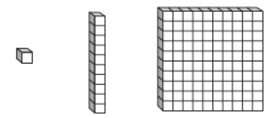
Grade 3 Mathematics
Key Concepts and Skills
A Parents' Guide

Below are the key mathematics concepts that we hope your child will master by the end of Grade 3.

Grade 3 is the year that we extend your child's number sense to working with larger numbers and with fractions. We hope they:

- have strong visual images for quantities,
- understand place value and the relationships between the places,
- can easily compare quantities,
- can represent quantities with objects and drawings (e.g., Base 10 materials),
- understand and use open number lines to represent numbers,
- notice and describe numeric and computational patterns,
- can create fractional units,
- can represent fractions on open number lines, and
- can compare fractions with like numerators or like denominators.



Grade 3 is the year that your child uses a variety of addition and subtraction strategies and representations to solve problems. Your child should be very flexible in the strategies they use and she or he should be able to solve a problem in more than one way.

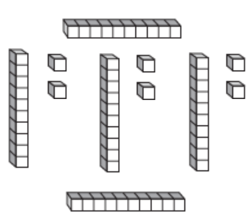
Grade 3 is also the year that your child is introduced to area, perimeter, and the models and language associated with multiplication and division.

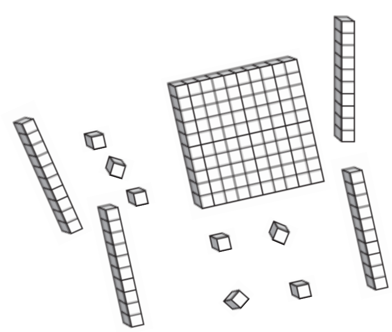
Number Concepts

Subitize Numbers

Subitize may be an unfamiliar term but many of us do this without knowing its name. For example, when you play a game involving dice, do you recognize a 6 without counting the pips? That is subitizing, recognizing and naming a quantity without counting the individual objects.

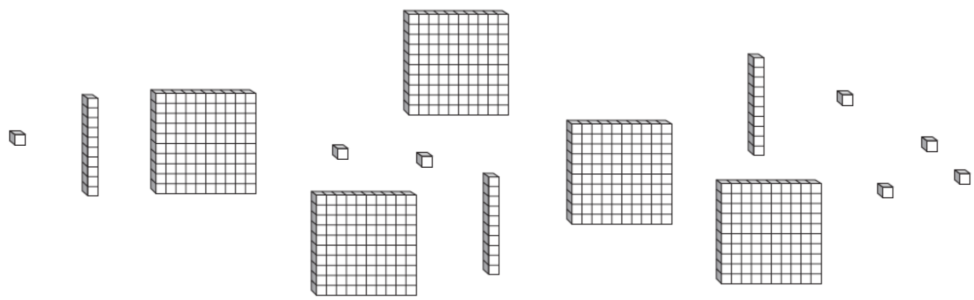
1. Your child should be able to subitize Base 10 materials in any arrangement and turned in a variety of ways. For example,

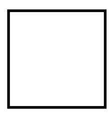


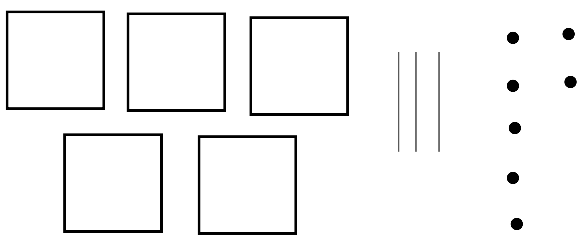


Place Value

2. Your child should be able to correctly read and write numbers between 1 and 1000 using numerals (e.g., 235, 56, 999), number words (e.g., two hundred thirty-five, fifty-six, and nine hundred ninety-nine), and expanded form (e.g., 235 = 200 + 30 + 5, 56 = 50 + 6, 999 = 900 + 90 + 9).
3. Your child should be able to represent numbers between 1 and 1000 using base 10 materials and the related drawings. Suppose the number is 537, your child could represent using base 10 materials as shown below (**Note:** Your child should understand that the position of the base 10 materials is not important. The materials themselves have the value of 100s, 10s, and 1s).

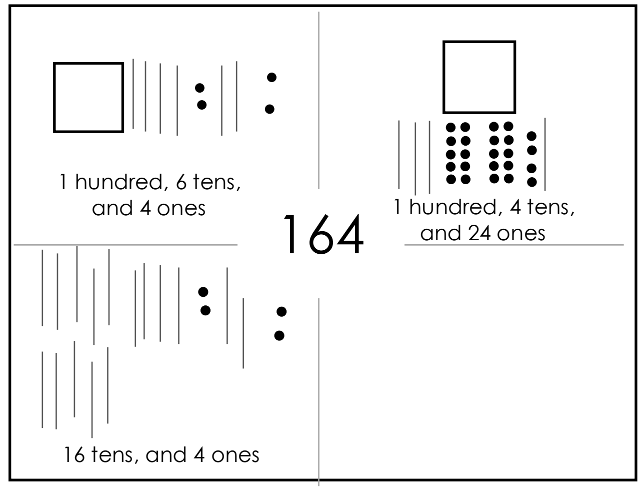


Your child can then draw a  for 100, a | for 10, and a • for 1.



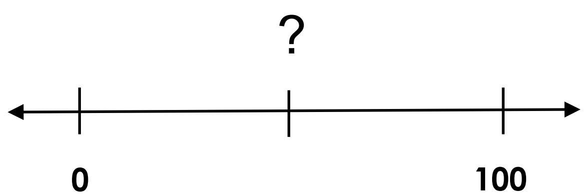
4. Given any number, your child should be able to name the number that is 1 more, 10 more, and 100 more.
5. Given any 2-digit number your child should be able to name the number that is 10 fewer, or 1 fewer.
6. Given any 3-digit number your child should be able to name the number that is 100 fewer, 10 fewer, or 1 fewer.

7. Your child should be able to represent quantities in a variety of ways using 100s, 10s and 1s. For example, 164 can be represented with 1 hundred, 6 tens and 4 ones, OR 1 hundred, 4 tens and 24 ones, OR 16 tens and 4 ones, etc.

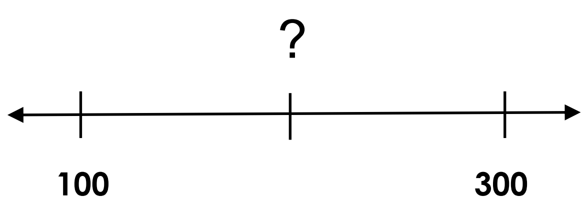


Open Number Lines

8. Your child is expected to be able to identify points on an "open" number line. An open number line is a number line on which only some of the hash marks are given. We use benchmarks such as halfway points to find the values on the number line. For example, in the number line below, the endpoints 0 and 100 are given. Your child is asked to find the halfway point, 50.



9. Your child may be asked to solve problems with "0" as one of the endpoints. He or she may also be asked to find the missing values when the starting number is a number other than 0. For example, in the problem below, your child is asked to find the value that is halfway between 100 and 300. (200)

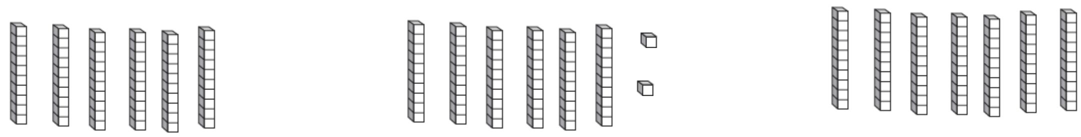


Comparing Quantities

10. Given 2 numbers, your child should be able to tell which is larger, smaller, or the same. He or she should be able to prove using base 10 materials, drawings, and showing on an open number line.
11. Your child should be able to correctly use the symbols >, <, =.

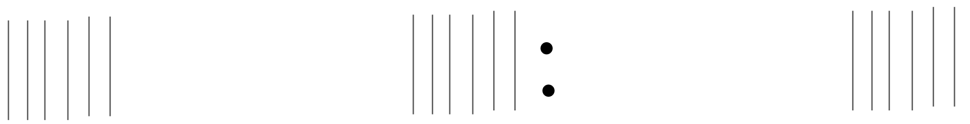
12. Your child should be able to represent the 10s that a 2-digit number is between with base 10 materials, drawings, number lines, and numerals. He or she should then be able to identify the nearest ten (round to the nearest 10). For example, 62 is between 60 and 70.

With base 10 materials:



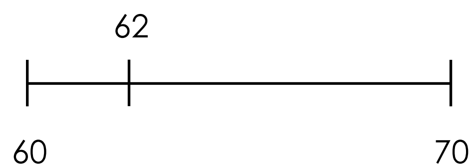
60 62 70

With drawings:



60 62 70

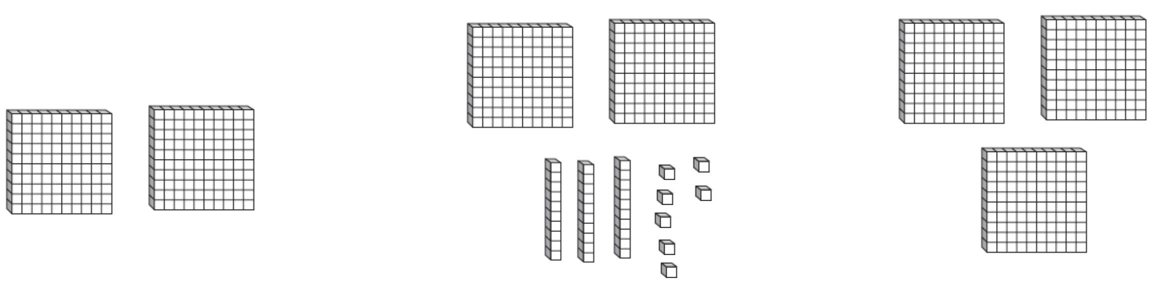
On an open number line:



Rounding to the nearest ten, 62 rounds to 60.

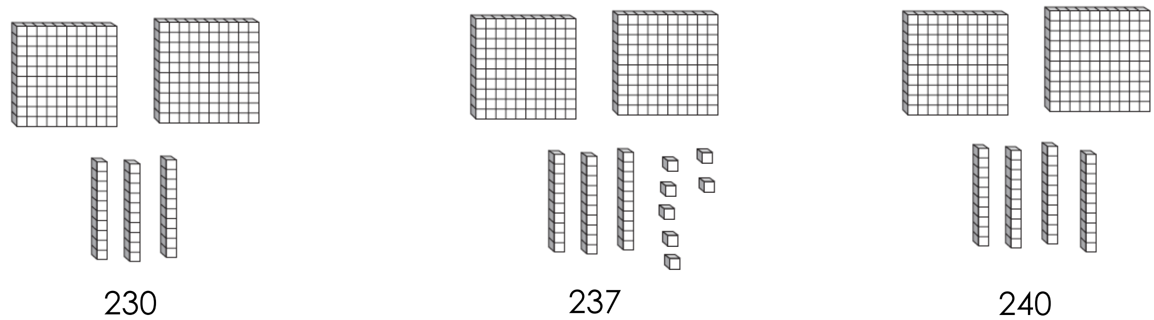
13. Your child should be able to represent the 100s and the 10s that a 3-digit number is between with base 10 materials, drawings, number lines, and numerals. He or she should then be able to identify the nearest hundred (round to the nearest 100) and the nearest ten (round to the nearest 10). For example, 237 is between 200 and 300 (hundreds it is between) and 230 and 240 (tens it is between).

With base 10 materials—the hundreds that 237 is between:

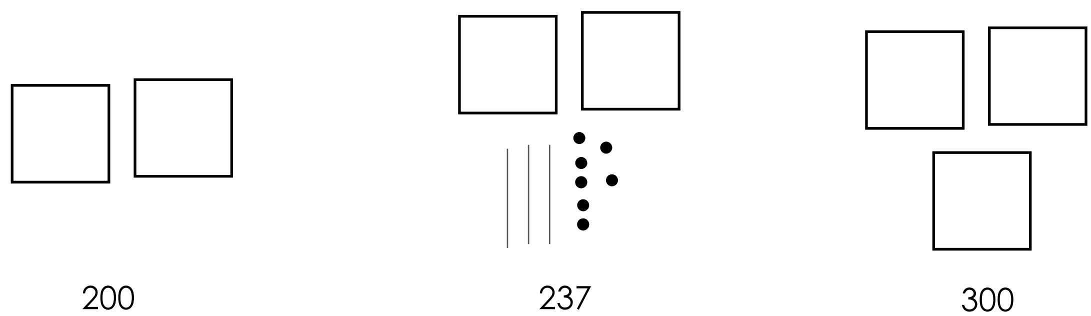


200 237 300

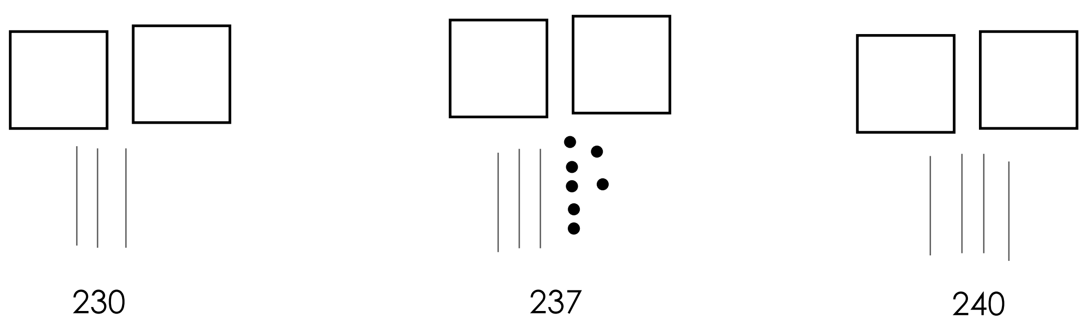
With base 10 materials—the tens that 237 is between:



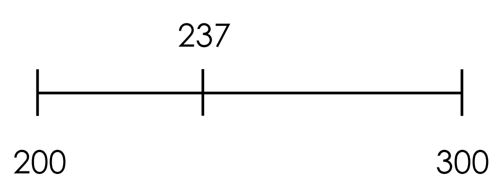
With drawings—the hundreds that 237 is between:



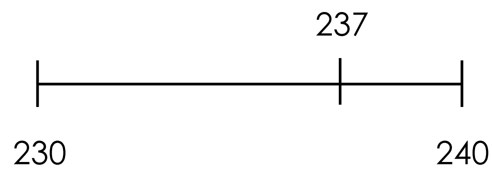
With drawings—the tens that 237 is between:



On an open number line—the hundreds that 237 is between:



On an open number line—the tens that 237 is between:



Rounding to the nearest hundred, 237 rounds to 200.

Rounding to the nearest ten, 237 rounds to 240.

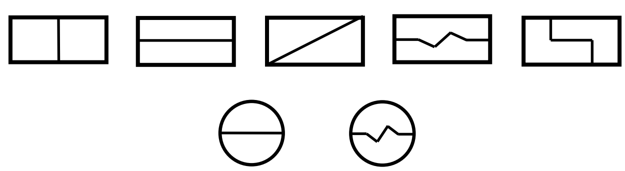
14. Your child understands that when rounding a number at the midpoint, we round up. For example, if we are rounding 65 to the nearest ten we know that 65 is the midpoint between 60 and 70. Therefore we round up to 70. If we are rounding 250 to the nearest hundred we know that 250 is the midpoint between 200 and 300. Therefore, we round up to 300.

Fractions

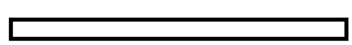
Creating Fractional Units

In grade 1, children begin work with fractions as they cut a whole into 2 or 4 equal pieces. In grade 2, children are asked to cut wholes into 2, 4, or 3 equal pieces and name the pieces. Your grade 3 child is asked to cut a whole into 2, 4, 8, 3, or 6 equal pieces and name the pieces.

1. Your child should be able to show multiple ways to cut a region into 2 or more pieces and prove that their pieces are the same size.



2. Your child should be able to cut a rectangular region (shown below) into 2, 4, 8, 3, or 6 equal pieces and draw a picture to match.

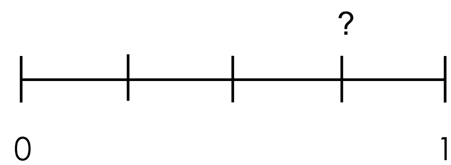


This drawing will be very useful in grades 4 and 5 as the children learn to add, subtract, multiply, and divide fractions.

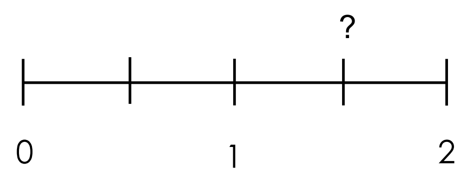
3. Your child can cut an interval from 0 to 1 (1 to 2, 2 to 3, and so on) on a number line into 2, 4, 8, 3, or 6 equal sections.

Naming Fractional Units

4. Many of us learned to name a fraction such as ¾ as three-fourths or 3 out of 4. It is important for your child to learn to name fractions in 3 ways: three-fourths, 3 out of 4, and 3 one-fourth pieces. In this last way of naming the fraction, your child learns that the numerator, 3, gives the number of unit fraction pieces (in this case one-fourth). A unit fraction is a fraction with the numerator of 1. This way of reading the fraction will help your child compare fractions.
5. Your child can name the fraction represented by the shaded portion and unshaded portion of a region.
6. Your child can write the fraction (e.g., ½) and fraction number word (e.g., one-half) represented by the shaded portion and unshaded portion of a region.
7. Your child can label fractions represented on a number line between 0 and 1. For example,



8. Your child can label fractions represented on a number line beyond 1. For example,



9. Your child can write the fraction number word represented on a number line.

Comparing Fractional Units

10. In Grade 3 your child should be able to compare fractions with the **same denominator**. For example,

$$\frac{3}{8} \qquad \frac{5}{8}$$

We'll ask your child, "Which is bigger 3, one-eighth pieces or 5, one-eighth pieces?" Understanding that you have more one-eighth pieces if you have 5 one-eighth pieces than 3 one-eighth pieces. Your child can defend that five-eighths is greater than three-eighths using fraction pieces or drawings.

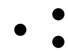
11. Your child should be able to compare fractions with the **same numerator**. For example,

$$\frac{3}{8} \qquad \frac{3}{6}$$

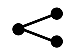
We'll ask your child, "Which is bigger 3, one-eighth pieces or 3, one-sixth pieces?" Understanding that since a one-sixth piece is bigger than a one-eighth piece, your child can defend that 3, one-sixth pieces would be greater than 3, one-eighth pieces using fraction pieces or drawings.

12. Your child understands that on a number line, the number to the right is larger. He or she can use this understanding to compare fractions on a number line.

13. Your child is also expected to use the symbols >, <, and = correctly. To help with this, we have your child put 2 dots next to the larger value and 1 dot next to the smaller number.

$\frac{3}{8}$  $\frac{3}{6}$

Your child then connects the dots.

$\frac{3}{8}$  $\frac{3}{6}$

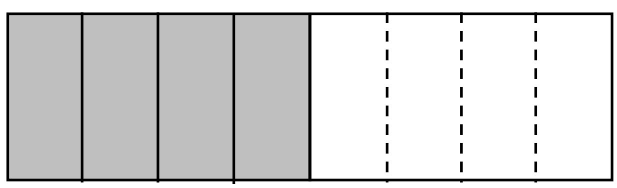
Equivalent Fractions

14. In Grade 3 your child should understand that we can divide the same region into smaller equal sized pieces. For example, we can begin with ½.

We can cut the halves into 2 equal pieces. We see that 2, one-fourth pieces is equivalent to one-half.

$$\frac{1}{2} = \frac{2}{4}$$

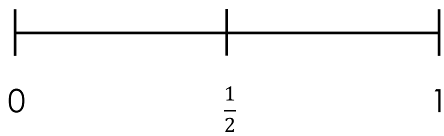
We can cut the fourths into 2 equal pieces. We see that 4, one-eighth pieces is equivalent to one-half.



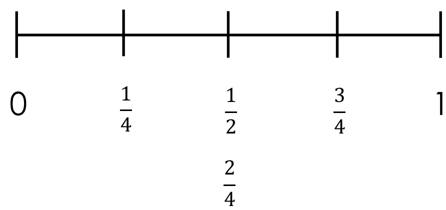
$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$$

Your child should understand how to create equivalent fractions using fraction pieces or drawings.

15. Your child understands that we can name the same location on a number line in more than one way. For example, suppose we cut the interval from 0 to 1 into 2 equal sections.

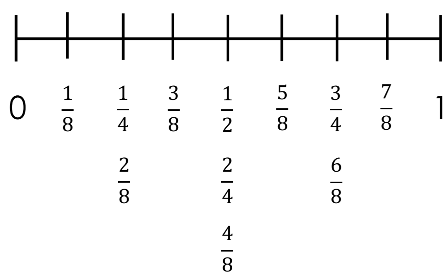


We then cut the interval from 0 to 1 into 4 equal sections.



$\frac{1}{2}$ and $\frac{2}{4}$ name the same location on the number line so $\frac{1}{2}$ is equivalent to $\frac{2}{4}$.

Suppose we repeat and cut the interval from 0 to 1 into 8 equal sections.



$\frac{1}{4}$ and $\frac{2}{8}$ name the same location on the number line so $\frac{1}{4}$ is equivalent to $\frac{2}{8}$.

$\frac{1}{2}$, $\frac{2}{4}$, and $\frac{4}{8}$ name the same location on the number line so they are equivalent.

$\frac{3}{4}$ and $\frac{6}{8}$ name the same location on the number line so $\frac{3}{4}$ is equivalent to $\frac{6}{8}$.

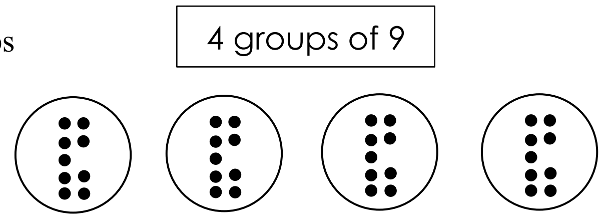
Your child should understand that equivalent fractions on a number line name the same location. She or he should be able to represent equivalent fractions on a number line and defend that the fractions are equivalent.

Multiplication and Division

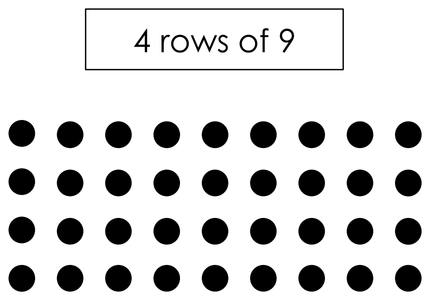
Multiplication Concepts

1. For many of us, learning multiplication involved memorizing the multiplication facts. Although fact fluency is important, your child is expected to understand all of the ways that we represent multiplication: equal groups, equal rows (array), equal jumps, and area. For example,

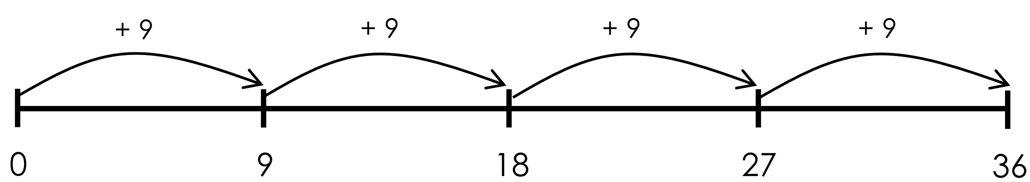
Equal Groups



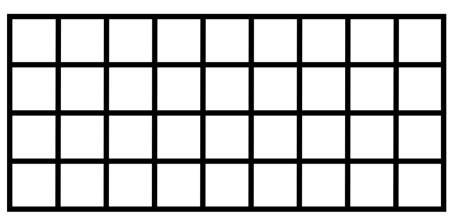
Equal Rows (Array)



Equal Jumps



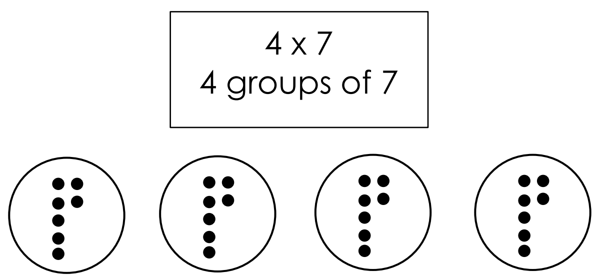
Area



2. These above models are the models your child will see in multiplication story problems. Your child should know how to represent each model with concrete materials (such as beans, cubes, etc.) and drawings.

3. Your child should know the language associated with each multiplication model. For example,
    - equal groups of,
    - equal rows of,
    - equal jumps of,
    - or “by” (when working with area).

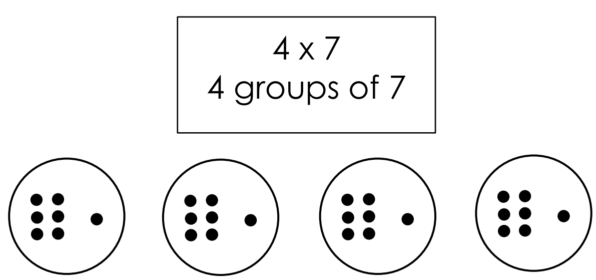
   For a problem such as 4 x 9, we could read as:
    - 4 groups of 9,
    - 4 rows of 9,
    - 4 jumps of 9, or
    - 4 by 9.
4. Your child should understand that multiplication is Commutative. That is the order in which we multiply numbers will not change the product. For example, 9 x 5 is the same as 5 x 9. 2 x 9 x 5 is the same as 2 x 5 x 9.
5. Your child should understand and explain the patterns that occur when multiplying a one-digit number by 10 or a multiple of 10. For example, 9 x 20 is the same as 9 x (2 x 10) or (9 x 2) x 10. We can first find the fact we know, 9 x 2, and then multiply by 10. For 9 x 50 we could first find 9 x 5 and then multiply by 10. This is the Associative Property.
6. Your child should understand and use the Distributive Property to find the product of 2 numbers (Note: We begin with single-digit multiplication to introduce the Distributive Property. We then extend its use to larger numbers in grade 4).



Looking at the above picture we can think of 7 as 5 and 2. We then have 4 groups of 5 put together with 4 groups of 2.

$$\begin{aligned} 4 \times 7 &= 4 \times (5 + 2) \\ &= 4 \times 5 + 4 \times 2 \quad \text{OR } (4 \times 5) + (4 \times 2) \\ &= 20 + 8 \\ &= 28 \end{aligned}$$

If we use the picture below we can think of 7 as 6 and 1.



We have 4 groups of 6 put together with 4 groups of 1.

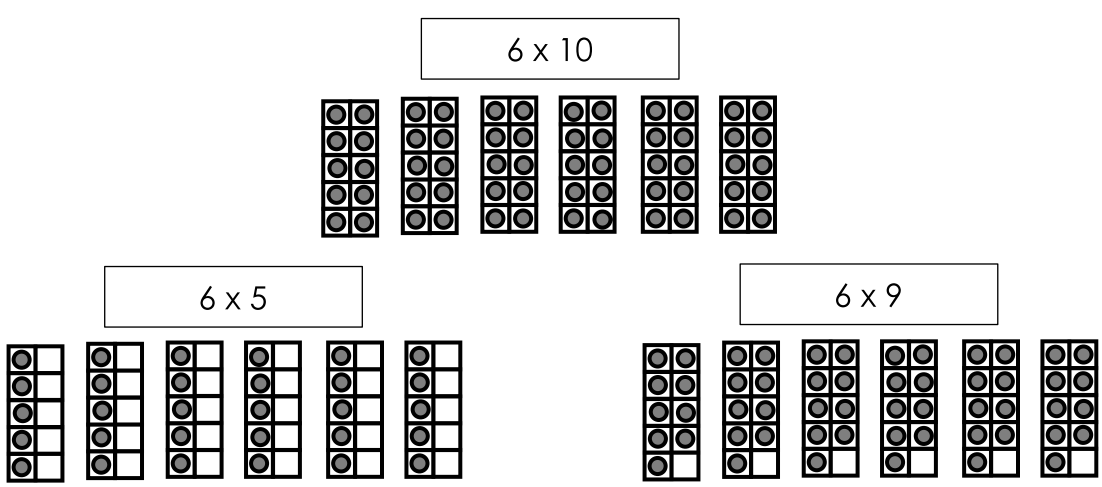
$$
\begin{aligned}
4 \times 7 &= 4 \times (6 + 1) \\
&= 4 \times 6 + 4 \times 1 \text{ OR } (4 \times 6) + (4 \times 1) \\
&= 24 + 4 \\
&= 28
\end{aligned}
$$

Your child should understand that there are several ways to separate 7 into groups. He or she should then be able to use that understanding to find the product in multiple ways.

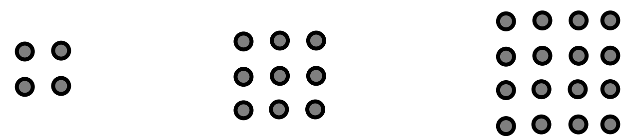
7. Your child should understand that although the totals are the same for problems such as 1 x 7 and 7 x 1, the pictures will be different.

Multiplication Facts

8. Your child should understand and use a variety of multiplication strategies to name multiplication facts (1-digit by 1-digit products).
   - Your child should know that anything multiplied by 0 will be 0. To make this memorable we may ask your child to draw 7 groups of 0, 3 groups of 0, 3 rows of zero, zero groups of 7, zero rows of 5, zero jumps of 9.
   - Your child should know that anything multiplied by 1 maintains its identity. For example, 7 multiplied by 1 is 7.
   - Your child should be able to describe the products for multiple groups of 10. For example, 5 groups of 10 is 50, 7 groups of 10 is 70, 8 groups of 10 is 80, etc. He or she may picture filled 10 frames or base 10 rods.
   - Your child should understand the relationship between the 9 facts and the 10s. That is, the 9s have one fewer in each group. Therefore, we can build down from the 10s. For example, if 6 tens is 60, 6 nines would be 60 minus 6 (1 fewer in each group) or 54. If 8 tens is 80, 8 nines would be 80 minus 8 (1 fewer in each group) or 72.
   - Your child should understand the relationship between the 5 facts and the 10s. That is, the 5s are half of the tens. For example, if 6 tens is 60, 6 fives is half of that or 30. If 8 tens is 80, 8 fives is half of that or 40.

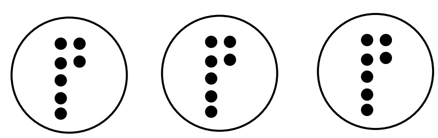


- Your child should be able to double a number (2s facts). For example, 2 x 7 is the same as double 7 or 14.
- Your child should be able to double a number twice for the 4s facts. For example, 4 x 7 can be thought of as double 7 is 14, double 14 is 28.
- Your child should be able to double a number three times for the 8s facts. For example, 8 x 7 can be thought of as double 7 is 14, double 14 is 28, double 28 is 56.
- Your child should understand that square numbers (2 x 2, 3 x 3, 4 x 4, etc.) can be represented as squares and used to name those facts.



Note: If your child knows these facts and knows that you can "flip" the known facts to get the same product (Commutative Property: if you know 2 x 3 = 6 then you know 3 x 2 = 6), then your child knows all but a few facts. We have not listed the 3s, 6s, or 7s in this sequence. The only facts that we are missing are 3 x 6, 3 x 7, 6 x 3, 6 x 7, 7 x 3, 7 x 6. Understanding the Commutative Property reduces this list to 3 facts. We are missing 3 x 6. 3 x 6 is double 3 x 3. We are missing 6 x 3 and 6 x 7. If your child knows 3 x 6 is 18 then he or she knows 6 x 3 is 18. 6 x 7 is double 3 x 7. If your child knows 3 x 7 is 21 then 6 x 7 is double that or 42. We are missing 7 x 3 and 7 x 6 but we've already addressed those facts. Technically the one fact to memorize is 3 x 7. However, the example of the Distributive Property shown earlier provides an image and strategy for finding this fact.

3 x 7
3 groups of 7



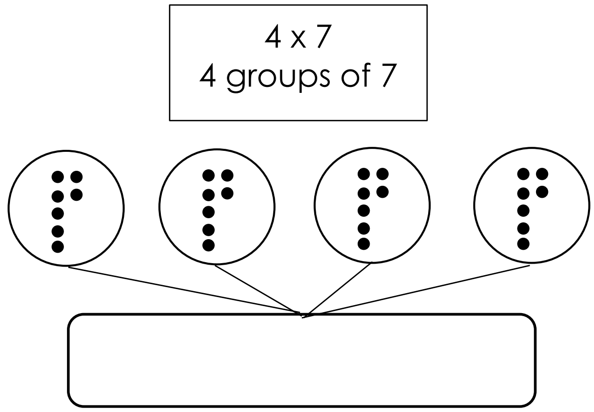
3 groups of 7 is the same as 3 groups of 5 put together with 3 groups of 2.

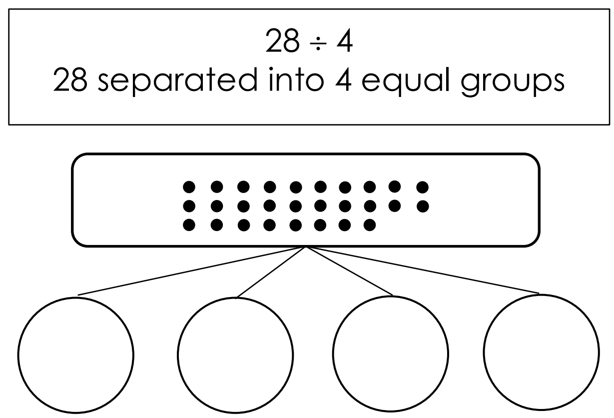
3 x 5 + 3 x 2 OR (3 x 5) + (3 x 2)

15 + 6 = 21

Division

9. Your child should understand that multiplication and division are inverse operations. That is, your child should understand that:
    - if multiplication is combining equal groups, division is separating into equal groups or pulling off equal groups of a given number.
    - if multiplication is combining equal rows, then division is separating into equal rows or pulling off equal rows of a given number.
    - if multiplication is combining equal jumps, then division is separating into equal jumps.
    - if multiplication is finding the area when given the dimensions of a rectangle, then division is finding an unknown side length when the area and one side length is known.





10. In grade 3, your child is expected to understand the different representations and language for division. For example,
    - separating into equal groups,
    - how many groups of ___ are in ___,
    - separating into equal rows,
    - how many rows of ___ are in ___,
    - separating into equal jumps,
    - how many jumps of ___ are in ___.

    For a problem such as 24 ÷ 6, we could read as:
    - 24 separated into 6 equal groups,
    - how many groups of 6 are in 24,
    - 24 separated into 6 equal rows,
    - how many rows of 6 are in 24,
    - 24 separated into 6 equal jumps,
    - how many jumps of 6 are in 24.

11. He or she is also expected to use his or her knowledge of multiplication to divide. That is, to find 24 ÷ 6 your child can think, “What times 6 is 24?” (missing factor). This is helpful when using the area model to divide. For example, 6 by ___ is 24.

Word Problems

12. Your child should be able to represent and solve multiplication and division multi-step word problems.

Addition & Subtraction

Word Problems

1. Your child should be able to use a variety of addition and subtraction strategies to solve multi-step word problems.

Addition Strategies

2. Your child should understand and use the Associative Property when appropriate to solve addition problems. In grade 1 your child learned that another way to think of 9 + 4 is as 10 + 3 or 8 + 6 as 10 + 4. This was called the bridge to 10 strategy. In grade 2 we used this strategy to solve problems such as 38 + 16 knowing that it is the same as 40 + 14. In grade 3 your child learns it is the Associative Property. For example, to solve 538 + 197 we think of 538 as 535 + 3. Instead of associating the 3 with the 535 we associate it with 197,

   538 + 197 = (535 + 3) + 197 = 535 + (3 + 197)

   So, 538 + 197 = 535 + 200 = 735

   This is a powerful mental strategy.

3. Your child should be able to use doubles and near doubles (doubles plus 1, doubles minus 1, doubles plus 2, doubles minus 2) when appropriate to solve addition problems. For example, to solve 199 + 199, your child can think of this problem as double 200 minus 2. To double 137, your child can double 100, double 30, and double 7.

double 100, double 30, and double 7
137 + 137 = 200 + 60 + 14 = 274

4. Your child should understand that when you add 2-digit or 3-digit numbers you add like places. That is, the hundreds go with hundreds, the tens with tens, and the ones with ones. It doesn't matter where the numbers are written (It is not required that they are aligned. This is why you often see problems written horizontally, not just vertically).

Subtraction Strategies and Representations

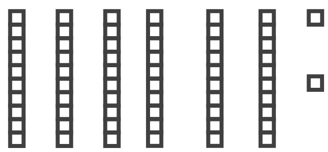
In grade 3, your child should be fluent with a variety of subtraction strategies. He or she should understand why a chosen strategy works.

5. Your child should understand and use the round and adjust strategy when appropriate to solve subtraction problems.

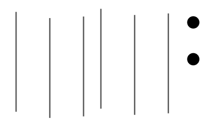
   Example: 62 – 29

   Begin with showing 62 using Base 10 materials (with materials and as a drawing).

   Materials

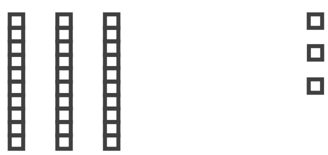
   

   Drawings

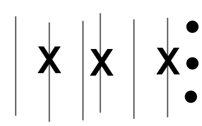
   

   To remove 29, we remove 30 and then give back 1. We rounded the 29 to 30 and then needed to adjust (give 1 back) because we took away one too many. Another way to think about this is with money. Suppose you have 6 dimes and 2 pennies. You buy something that costs 29¢. You don't trade a dime for 10 pennies. You give the cashier 3 dimes. They give you back 1 penny. That is what we just did with the tens and ones. This strategy models what we do when we pay for items with cash. The illustrations below show the changes in our materials and drawing after using this strategy.

   Materials

   Drawings

   We removed 3 tens, or 30, and gave back 1. (Note: It doesn't matter which of the 10s are removed or crossed out.)

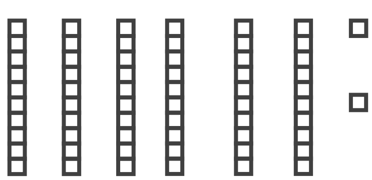
   $$62 - 29 = 62 - 30 + 1 \text{ or } 33$$

6. Your child should understand and use place value and decomposing a 10 or 100 when appropriate to solve subtraction problems.

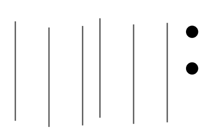
   Example 1: 62 – 29

   Begin with showing 62 using Base 10 materials (with materials and as a drawing).

   Materials

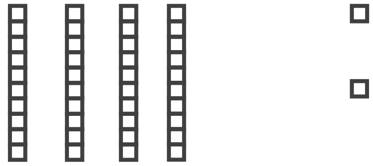
   

   Drawings

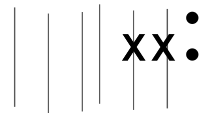
   

We think of 29 as 20 and 9. First remove 20.

Materials

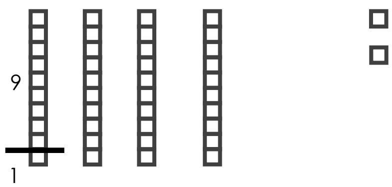


Drawings

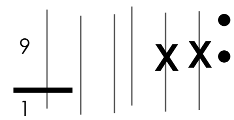


We don’t have 9 ones to remove so we “cut” a 10 into 9 and 1 (Note: It doesn’t matter which 10 we cut into 2 pieces).

Materials

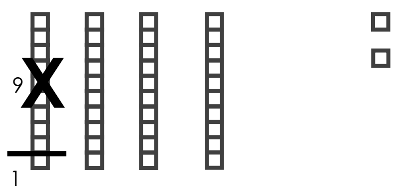


Drawings

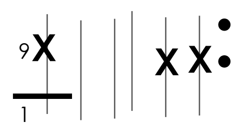


We “remove” the 9 and we are left with the answer.

Materials



Drawings

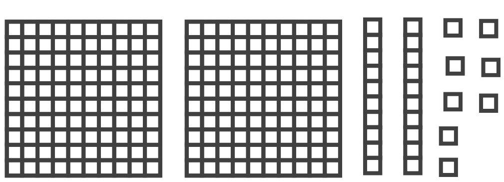


62 – 29 = 62 – 20 – 9 or 33

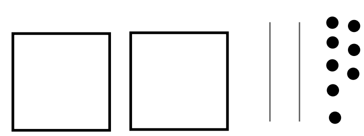
<u>Example 2:</u> 228 – 83

Begin with showing 228 using Base 10 materials (with materials and as a drawing).

Materials

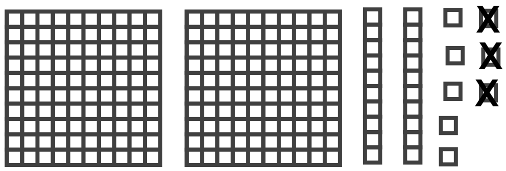


Drawings

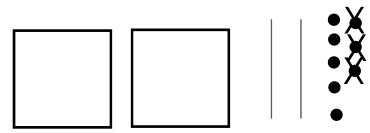


We think of 83 as 80 and 3. We can first remove either 80 or 3. Since we have 8 ones let's remove the 3 ones first.

Materials

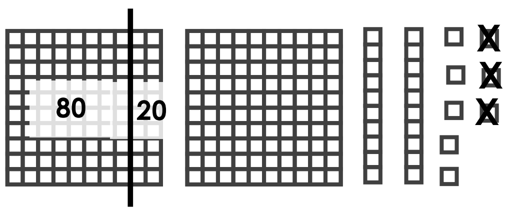


Drawings

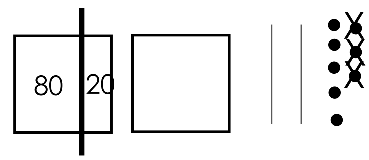


We don't have 8 tens to remove so we "cut" a 100 into 80 and 20 (Note: It doesn't matter which 100 we cut into 2 pieces).

Materials

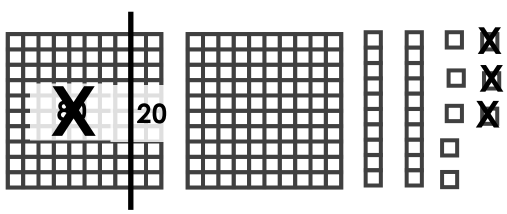


Drawings

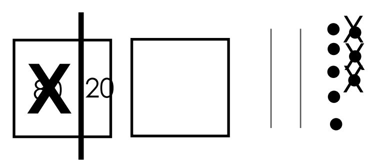


We "remove" 80 and we are left with the answer.

Materials



Drawings



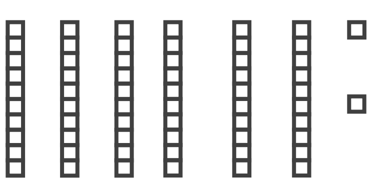
228– 83 = 228 – 3 – 80 or 145

7. Your child should understand and use place value, part-part-total, and decomposing a 10 or 100 when appropriate to solve subtraction problems.

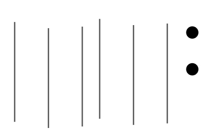
   Example 1: 62 – 29

   Begin with showing 62 using Base 10 materials (with materials and as a drawing).

Materials

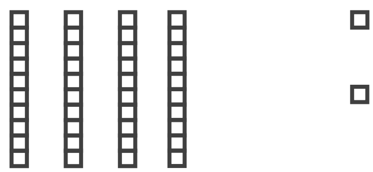


Drawings

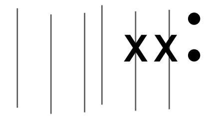


We think of 29 as 20 and 9. First remove 20.

Materials

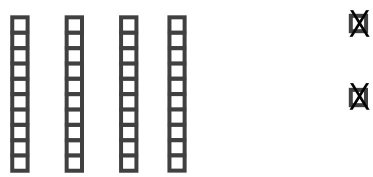


Drawings

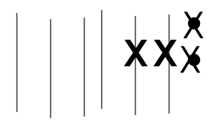


We don't have 9 ones to remove but we do have 2 ones. Remove the 2 ones.

Materials

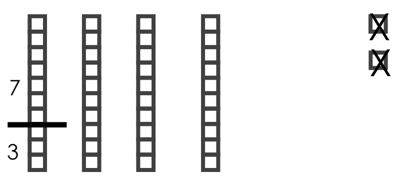


Drawings

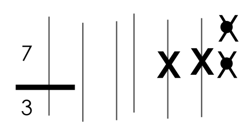


We still need to remove 7. At this point we've thought of 9 as 2 + 7 (Part-part-total; part 1 is 2, part 2 is 7, total is 9). So we "cut" a 10 into 7 and 3 (Note: It doesn't matter which 10 we cut into 2 pieces).

Materials

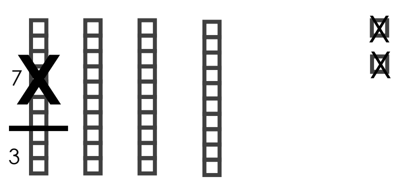


Drawings

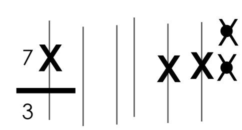


We "remove" 7 more and we are left with the answer.

Materials



Drawings

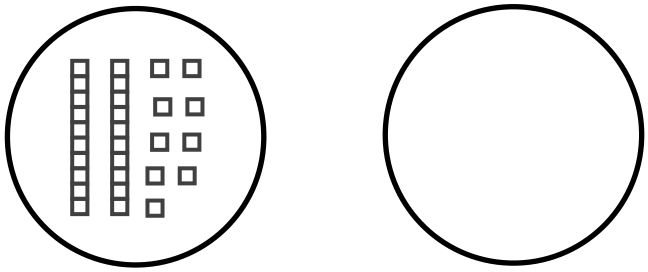


62 – 29 = 62 – 20 – 2 – 7 or 33

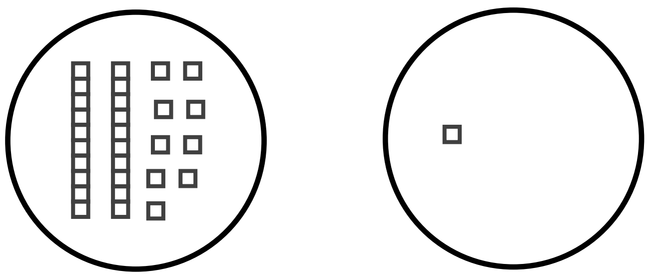
8. Your child should understand and use a counting up strategy (find the missing part) to solve subtraction problems. This strategy involves thinking of subtraction as a comparison. We think of problems such as 62 – 29 as how many more than 29 is 62 or how many do we need to add to 29 to get to 62.

29 + ___ = 62

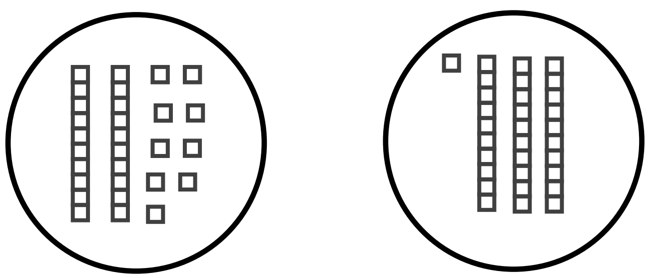
Example: To solve 29 + ___ = 62 (or 62 – 29) using a missing part strategy, begin with representing the part you know (29). This is represented on the left. We add 10s and 1s until we reach 62 on the right.



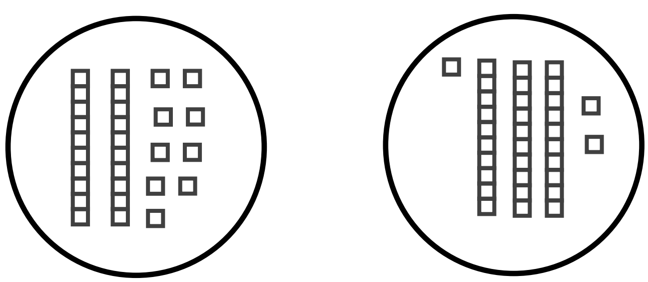
For example, if we add a 1, we have a total of 30. (**Note:** We don't have to begin by adding ones. We could put tens on the plate first until we get close to the goal number.)



We add 10s until we reach a total of 60.



We then add 1s until we reach a total of 62.



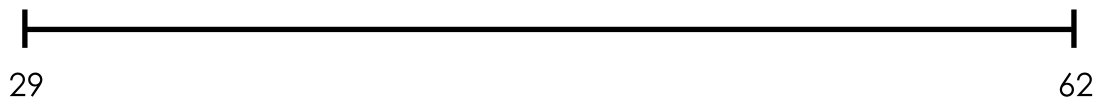
The missing part is 33.

29 __**33**__ = 62 so 62 – 29 = **33**

9. Your child should understand and use a counting up strategy on an open number line (find the missing part) to solve subtraction problems. This strategy involves thinking of subtraction as a comparison. We think of problems such as 62 – 29 as how many more than 29 is 62 or how many do we need to add to 29 to get to 62. We solve these problems by making jumps on an open number line.

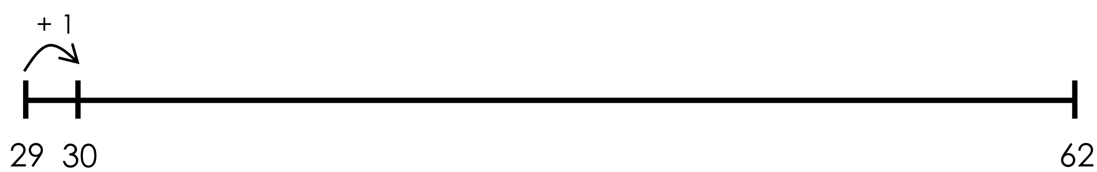
29 + ___ = 62.

Example 1: 29 + ___ = 62 (or 62 – 29) using a counting on strategy. We begin with an open number line with the start number on the left and the goal number on the right.

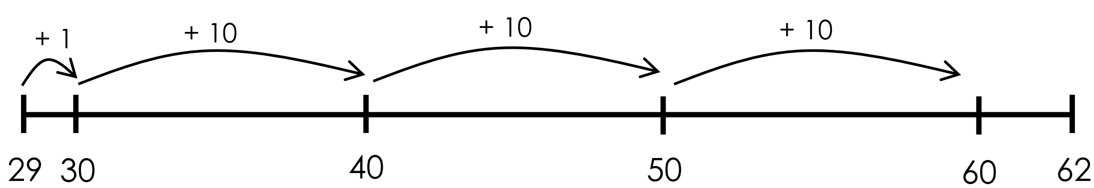


The goal is to find the distance between 29 and 62 by making jumps. **Note:** There are many different ways to "jump" from 29 to 62.

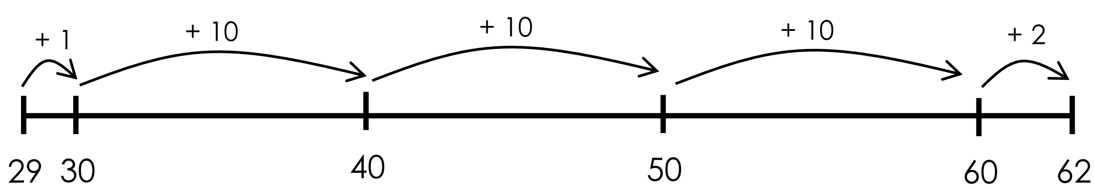
We can make a jump of 1 to get to 30 (Count up 1).



We can make jumps of 10 to get to 60 (Count up 10, 20, 30).



We make a jump of 2 to get to 62 (Count up 2).

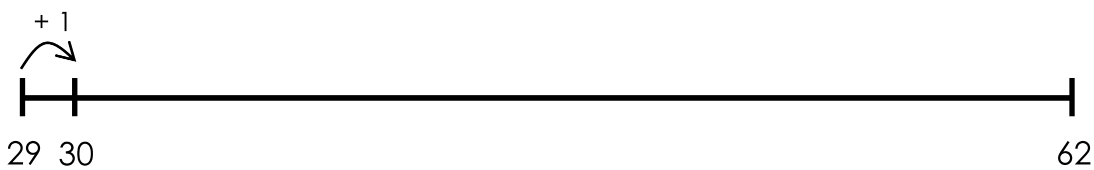


We combine the jumps to get the missing addend.

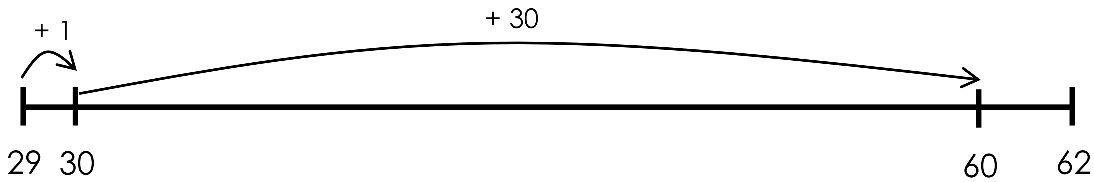
29 + **1 + 10 + 10 + 10 + 2** = 62
29 + **33** = 62 so 62 – 29 = **33**

Example 2: 29 + ___ = 62 (or 62 – 29) using a counting on strategy. We begin with an open number line with the start number on the left and the goal number on the right.

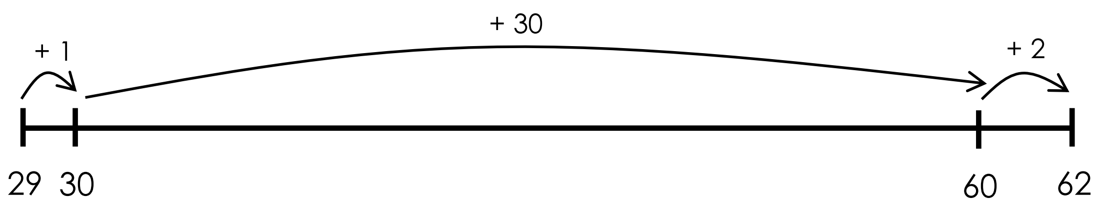
We can make a jump of 1 to get to 30 (Count up 1).



We can make a jump of 30 to get to 60 (Count up 30).



We make a jump of 2 to get to 62 (Count up 2).



We combine the jumps to get the missing addend.

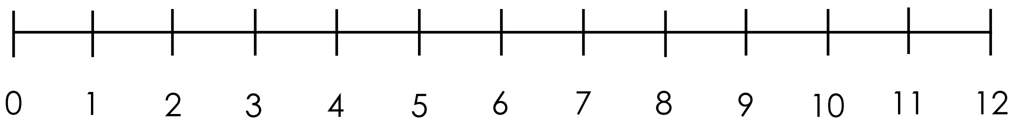
29 + **1 + 30 + 2** = 62
29 + **33** = 62 so 62 – 29 = **33**

Measurement Concepts

Time

1. It is important for your child to accurately tell time to the nearest minute on an analog clock. An analog clock is the clock that is divided into 12 equal sections. Sometimes the sections are numbered 1 to 12, with 12 at the top of the clock. Sometimes only some of the sections are labeled (e.g., 3, 6, 9, and 12). Your child should understand that the numbers on the clock represent 2 different time measures. First, the numbers represent the number of hours that have passed since midnight or since noon. It takes 1 hour for the hour hand to move from one number to the next. The numbers also represent multiples of 5 minutes.

2. Your child should understand that an analog clock is a number line that wraps on itself. If we "unwrap" the clock face we would have something similar to the number line show below.



   At 12 we are back at 0.
3. Your child should be able to represent times on a number line.
4. Your child should be able to solve addition and subtraction story problems involving time.

Money

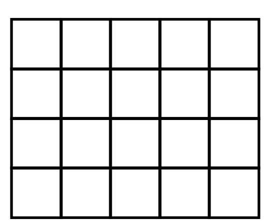
5. In 3rd grade your child is expected to be able to:
   - name each of the coins regardless of the image on the head or tail,
   - name the value of each coin,
   - find and name other information available on the coins (date, United States of American, In God We Trust, value, etc.),
   - name the total when given a collection of mixed coins,
   - show multiple ways to make the same value using coins, and
   - solve money story problems.

Liquid Volume and Mass

6. Your child should be able to use a variety of measurement tools such as beakers, measuring cups, etc. to measure liquid volume (cups, ½ a cup, ¼ of a cup, ounces, liters, milli-liters, etc.).
7. Your child should be able to use balances, scales, etc. to find the mass of objects in pounds, ounces, grams, kilograms, etc.
8. Your child should be able to solve story problems involving mass or liquid volumes.

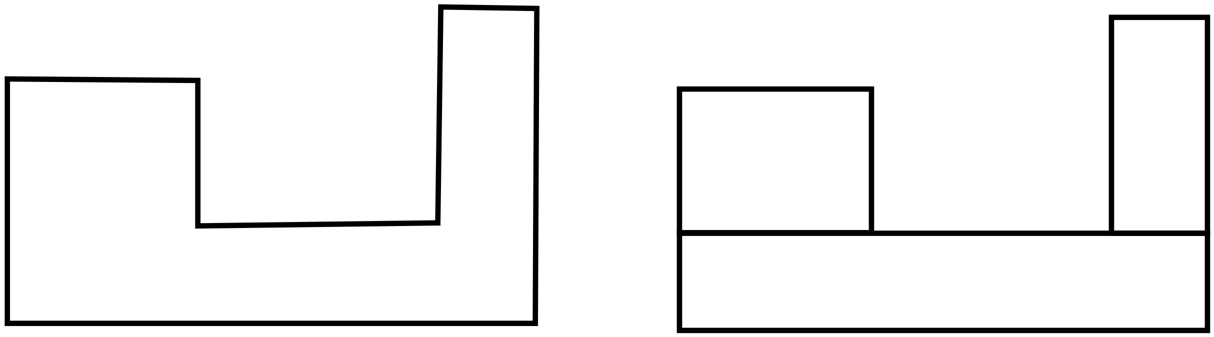
Area

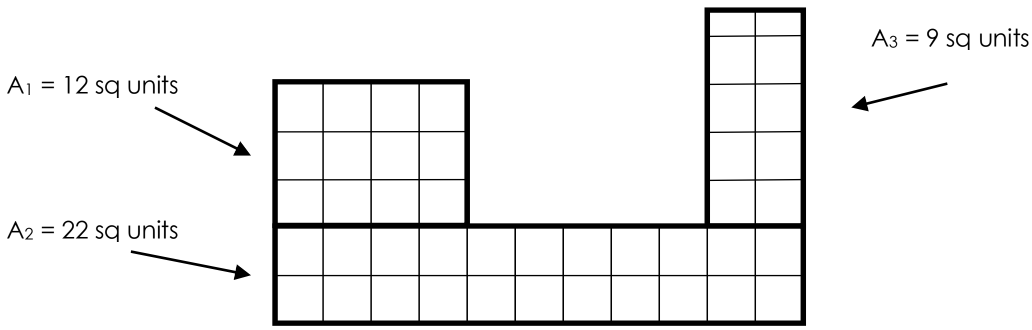
9. Your child should understand that area is a measure of the number of square units that can fill a 2-dimensional shape.
10. Your child should understand that we can find the area of a rectangle by tiling it with 1 by 1 squares. He or she should understand, and be able to prove, that adding the squares within the rectangle will give the same result as multiplying the side lengths. For example, for the rectangle below we could count by 5s, 5, 10, 15, 20 (5 + 5 + 5 + 5 = 20) to get the area.



    We would get this same answer if we multiply 4 by 5, 4 x 5 = 20.

11. Your child should understand that we can find the area of non-overlapping pieces of a shape and put them together to find the total area of a shape. For example, the shape below can be cut into rectangles as shown on the right. We can then find the area of each rectangle, combine those areas and obtain the area of the original shape.





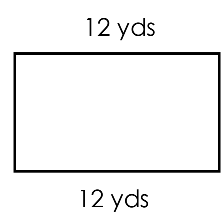
Combining the areas, A_1, A_2, and A_3

$$A_1 + A_2 + A_3 = 12 + 22 + 9 \text{ sq units} = 43 \text{ sq units}$$

Perimeter

12. Your child should understand that perimeter is a linear measure. We find perimeter by finding the distance around a 2-dimensional shape.
13. Your child should be able to solve story problems involving perimeter including finding an unknown side length when the perimeter is known. For example,

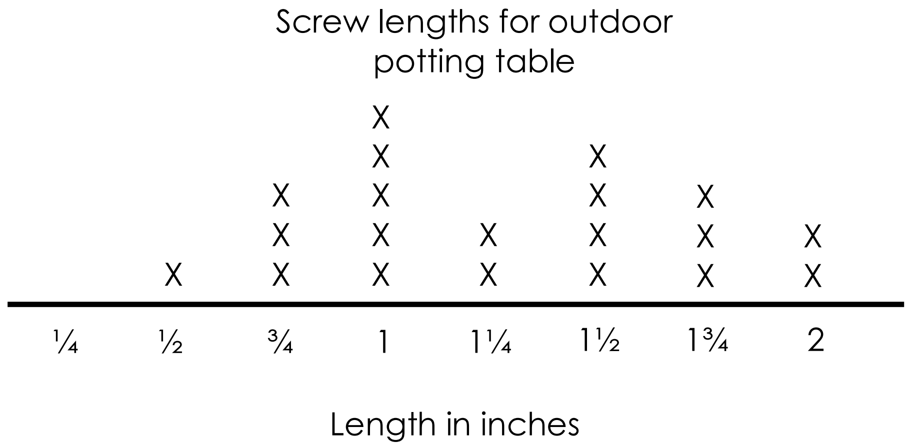
    Aidan and Colleen made a play yard in the shape of a rectangle for their dogs. Two of the sides are 12 yards each. What are the other two side lengths if they used 36 yards of fencing?



Represent and interpret data

14. Your child should be able to draw a picture graph or a bar graph with a scale of 1 and a scale of more than 1. For example, your child should be able to draw a bar graph in which each square represents 5 animals.
15. Your child should be able to solve one- and two-step story problems about a scaled bar or picture graph.

16. Your child should be able to measure a collection of items to the nearest quarter of an inch and create a line plot to show the data. For example,



Geometry

1. Your child should understand that shapes can be sorted in many different ways. For example, we can sort shapes by the number of sides. 4-sided shapes (quadrilaterals) would include parallelograms (opposite sides are the same length and parallel), rectangles (parallelograms with right angles), squares (rectangles with equal sides), trapezoids (one set of parallel sides), rhombi (parallelograms with equal sides), etc. These 4-sided shapes can be sorted into subcategories such as parallelograms and trapezoids. Parallelograms can be sorted into subcategories such as rectangles, rhombi, etc.
2. Your child should understand that a shape can fit into several different categories. For example, a square could be placed in the quadrilateral group, the parallelogram group, the rectangle group, and the rhombus group.