Grade 2—Home Math Activities

Below are math activities that you can do at home with your child. Please note that this document is organized into 3 sections.

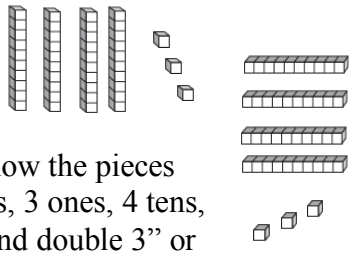
- Section 1—Child activities: Number and Addition Strategies & Games, pp 1-13
- Section 2—Parent Information: Subtraction Strategies & Drawings (This section is to provide information regarding the variety of strategies we hope Grade 2 students use and understand), pp 14-24.
- Section 3—Child activities: Subtraction, Money, Measurement, and Geometry, pp 25-37.

Section 1—Child Activities

Number Activities using *Base 10 Concentration* Cards

Prep: Print, cut, and shuffle the cards well.

Activity 1—Name that number



- Shuffle the cards well.
- Flash the card quickly.
- Have your child name the number they see.
- For cards showing pictures of quantities, ask your child to describe how the pieces are arranged. (For the picture on the right your child may say, "4 tens, 3 ones, 4 tens, and 3 ones" as they point in the air. He or she may say, "double 40 and double 3" or "There are 4 tens and 3 ones and another 4 tens and 3 ones that is turned.")
- Flash the card again quickly.
- Ask your child if he or she changed his or her mind.
- Show the card so your child can check.
- Repeat for the remaining cards.

Activity 2—Write that numeral

- Remove the numeral cards (13, 24, 36, 47, 53, etc.)
- Shuffle the remaining cards well.
- Flash the card quickly.
- Have your child write the numeral that goes with the quantity they see (For example, 86, 131, 201, 47 etc.).
- Flash the card again quickly.
- Ask your child if he or she changed his or her mind.
- Show the card so your child can check.
- Repeat for the remaining cards.

If your child has difficulty with this activity, have her or him place the numeral cards face up on the table. When you flash the card, he or she picks the matching numeral card and explains how he or she knows it is a match.

Activity 3—Write the number word

- Shuffle the cards well.
- Flash the card quickly.
- Have your child write the number word that goes with the image on the card (For example, thirteen, eighty-six, two hundred one, etc. Note: We save the word "and" for the decimal point. That is why we would write two hundred one instead of two hundred and one).
- Flash the card again quickly.
- Ask your child if he or she changed his or her mind.
- Show the card so your child can check.
- Repeat for the remaining cards.

Activity 4—Who has more?

- Shuffle the cards well.
- Deal the cards so that each player has the same number of cards.
- Each player places their cards in a stack, face down.
- Each player turns over the top card on the stack.
- The player with the greater number states how they know it is greater. If the explanation makes sense, he or she then takes the cards and places on the bottom of the stack.
- See who can capture all of the cards.

Activity 5—Who has fewer? Who has less?

- Shuffle the cards well.
- Deal the cards so that each player has the same number of cards.
- Each player places their cards in a stack (face-down).
- Each player turns over the top card on the stack.
- The player with the smaller number states how they know it is smaller. If the explanation makes sense, he or she then takes the cards and places on the bottom of the stack.
- See who can capture all of the cards.

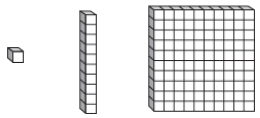
Other Number Activities

Activity 6—Quantity hunt

- Have your child look for things of which there are more than 25 around your home and in the neighborhood. For example, books, clothes, glasses, leaves, pebbles, windows, slats on a fence, paper clips in a box.
- Have your child draw pictures of what he or she finds and label with the appropriate numeral (e.g., 27, 14).

Base 10 Materials

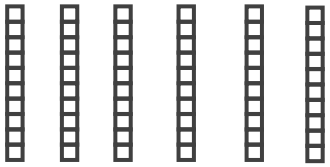
Note: In grades 2-5 we use Base 10 materials as models for 1s, 10s, and 100s. Your child can easily make a set for home use by cutting 10 by 10, 1 by 10, and 1 by 1 pieces from centimeter grid paper. A sheet with and without suggested cutting lines is included. For a greater challenge have your child cut the pieces from an unmarked copy without looking at the marked version. Have an extra copy or 2 available in case your child makes a mistake or if additional pieces are needed for later activities.



Activity 7—10 more, 10 fewer; 100 more, 100 fewer

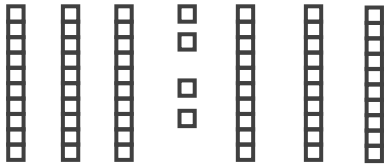
Prep: 1 or 2 pages of base 10 pieces (cut apart).

- Have your child count by 10s as you place a group of tens in front of him or her. For the following,



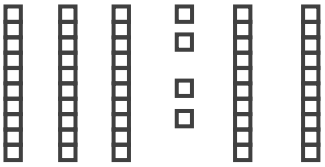
your child would count 10, 20, 30, 40, 50, and 60. If they seem to be skipping a piece or skipping a number, have your child point to each piece as he or she counts.

- Place 64 in front of your child (6 tens and 4 ones). The tens and the ones do not have to be grouped together. For example, the beginning arrangement could be as shown on the right.



Note: It is important that your child understands that the location of the 10s does not change its value. A 10 will be a 10 no matter its location. A 1 will be a 1 no matter its location.

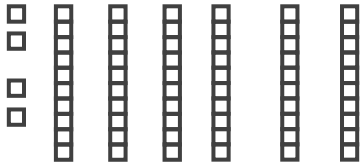
- Have your child count the pieces.
- Remove a 10 and ask your child to name the number that is 10 fewer (for our example it would be 54).



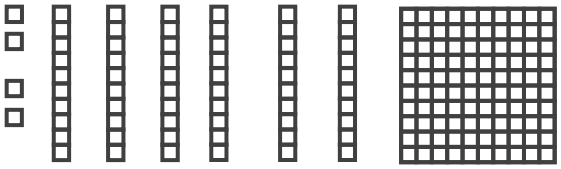
- Repeat by removing another 10 and ask your child to name the number that is 10 fewer.
- Repeat until you only have the "extras." (In our example it would be 4).

- Go the opposite direction by adding a 10. Ask your child to name the number that is 10 more (For our example it would be 14).

- Continue until you are back to the starting number (in our example it would be 64).



- Add a 100 piece and ask your child to name the number that is 100 more. (164)



- Repeat for another 100. (264)
- Remove a 100 and ask your child to name the number that is 100 fewer.

Repeat this activity on a different day for a different starting number.

Activity 8—All of the ways to make a number

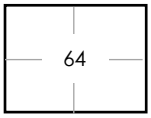
It is important for your child to understand that there are many different ways to make a number using 100s, 10s, and 1s. For example, 64 can be made with 6 tens and 4 ones, 4 tens and 24 ones, 64 ones, 3 tens and 34 ones, etc.

Note: Please allow your child to develop their own strategies for making sure they have found all of the ways. Tricks can prevent him or her from having this valuable problem-solving experience. This understanding and flexibility in playing with numbers will help them become more efficient and fluent when adding, subtracting, multiplying, and dividing. We will also use this technique to help your child become fluent in working with money.

Prep: 1 or 2 pages of base 10 pieces (cut apart), blank paper, pencil or crayon

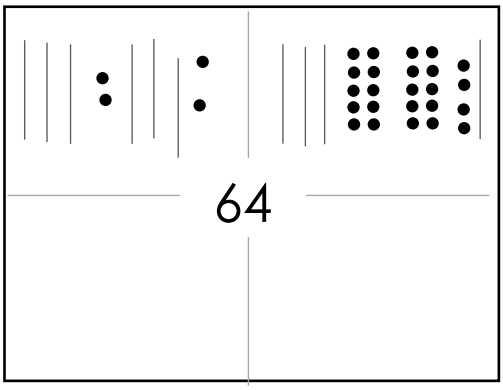
- Have your child fold a sheet of paper into 4 equal sections.

- Pick a 2-digit number (e.g., 64, 72, 53, 49).
- Have your child write the number in the center of the paper.

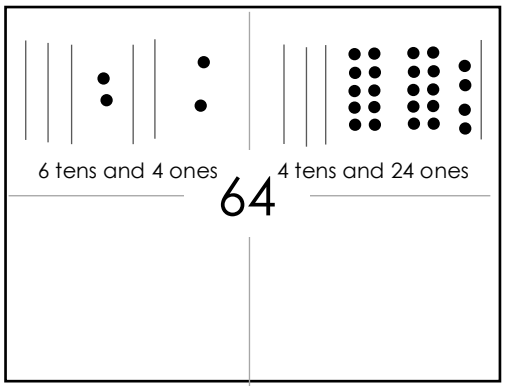


- To simplify the drawings of 2-digit numbers, have your child draw a | for 10 and a • for 1.

- Have your child draw as many different pictures as they can (one per section) for the given number. For example,



- After your child has drawn all of the possible pictures, have them label each drawing using, "____ tens and ____ ones." For example,



- Repeat for other 2-digit numbers on other days. When comfortable with 2-digit numbers, have your child do the same for 3-digit numbers. To simplify the drawings of 3-digit numbers, have your child draw a ▭ for 100, a | for 10, and a • for 1. Your child should draw at least 8 different pictures (4 on the front of the paper and 4 on the back) for each 3-digit number.

Addition Strategy Games

Bridge to 10 or 100 strategy using the *Bridge to 10 or 100 Concentration Cards*

The bridge to 10 strategy is a powerful addition strategy for your child to know. In grade 1 your child should learn that another way to think of 9 + 4 is as 10 + 3 or 8 + 6 as 10 + 4. In grade 2 your child will use this strategy to solve problems such as 38 + 6 knowing that it is the same as 40 + 4. They can link 38 + 16 to 40 + 14. When they reach grade 5 they will use the strategy to solve problems such as 3.8 + 1.6 linking the problem to 4.0 + 1.4. We call it the Bridge to 10 strategy in grades 1 and 2. In later grades your child will learn it is the Associative Property.

Prep: Print, cut, and shuffle the cards well.

Activity 1—Quantity Match

- Shuffle the cards well.
- Place cards face up in 4 rows with 6 cards in each row.
- Take turns finding matches.
- Each player must share how he or she knows it is a match before taking the cards.

Activity 2—Quantity Concentration

- Shuffle the cards well.
- Place cards face down in 4 rows with 6 cards in each row.
- Take turns turning over 2 cards and placing face up in the exact same spaces.
- If the cards match, the player must share how he or she knows it is a match before taking the cards. (The defense must make sense.)
- If the cards do not match, the player must share how he or she knows the cards do not match before turning them back over. (The defense must make sense.)
- See who can find the most matches.

Activity 3—Who has more?

- Shuffle the cards well.
- Deal the cards so that each player has the same number of cards.
- Each player places their cards in a stack, face down.
- Each player turns over the top card on the stack.
- The player with the greater number states how they know it is greater. He or she then takes the cards and places on the bottom of the stack.
- See who can capture all of the cards.

Activity 4—Who has fewer?

- Shuffle the cards well.
- Deal the cards so that each player has the same number of cards.
- Each player places their cards in a stack (face down).
- Each player turns over the top card on the stack.
- The player with the fewer number of dots states how they know it is fewer. He or she then takes the cards and places on the bottom of the stack.
- See who can capture all of the cards.

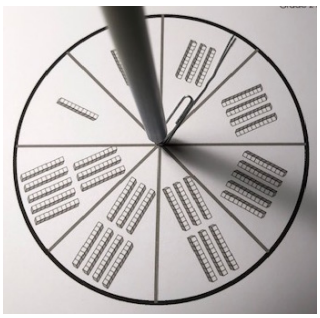
Doubling strategies using spinners

Doubles and near doubles (doubles plus 1, doubles minus 1, doubles plus 2, doubles minus 2) are also important addition strategies for your child to know. In grade 1 your child learns to double the numbers 1 to 9 (e.g., double 8 is 16, double 6 is 12). He or she may also double multiples of 10 (e.g., double 40 is 80, double 30 is 60). It is also important for your child to name the double (For example, when shown 7 + 7 your child can name it as double 7). A near double is a problem such as 7 + 8. It is important for your child to know that this is double 7 and 1 more or 1 fewer than double 8. As your child moves up through the grades they will use these strategies to quickly solve problems such as 199 + 199 (or 2 x 199). They think of this problem as double 200 minus 2. 56 + 56 (or 2 x 56) is double 50 plus double 6 or 112.

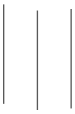
Materials: Grade 2 Spinners page, paper clip, blank paper, pencil or crayon.

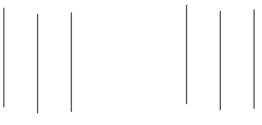
Activity 1—Draw the double—decade numbers (e.g., 10, 40, 80)

Prep: Print the Grade 2 Spinners page. Partially unfold a paper clip to use as the spinner. Gather a pen or pencil and a sheet of paper.



- Have your child fold a sheet of paper into 4 equal sections.
- Have your child spin the Base 10, decade spinner.
- To simplify the drawings of 2-digit numbers, have your child draw a for 10.
- In the first section of the paper, have your child draw what is on the spinner section where the paper clip is pointing.





- Have your child draw the same image again to show the double.
- Have your child spin the spinner a second time and draw the related double in the next section (Have your child try to draw a different double each time. He or she may need to spin the spinner more than once to get a new double. It is important for your child to decide if he or she already has drawn a given double.)

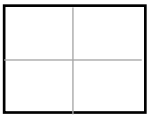
- Repeat by having your child spin the spinner and draw the related double in the next section on his or her paper.
- Have students complete the activity by spinning their spinner and drawing the related double a total of 8 times (4 drawings on the front of the paper and 4 drawings on the back).
- After your child has finished drawing 8 different doubles, have him or her go back and label the drawings. For example,

double 30
30 + 30 = 60

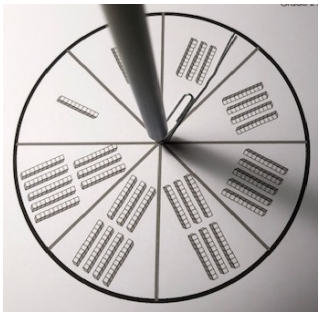
Activity 2—Draw the double—2-digit numbers

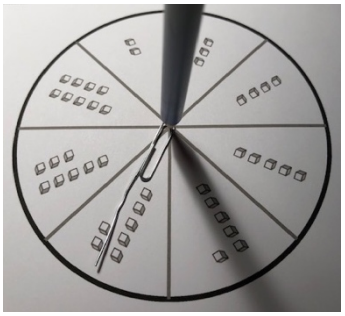
Prep: Print the Grade 2 Spinners page. Partially unfold a paper clip to use as the spinner. Gather a pen or pencil and a sheet of paper.

- Have your child fold a sheet of paper into 4 equal sections.

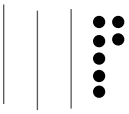


- Have your child spin the Base 10, decade spinner and the Base 10 ones spinner.



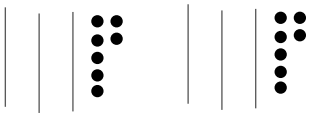


- To simplify the drawings of 2-digit numbers, have your child draw a | for 10 and a • for 1.
- In the first section of the paper, have your child draw what is on the spinner sections where the paper clips are pointing.

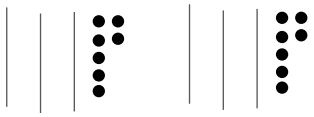


Note: It is helpful to have your child draw the ones using a 5-frame, 10-frame, or domino pattern instead of a random pattern. The pattern shown above is similar to the 5-frame pattern that is learned in grade 1 and that we use for other strategies. Drawing 7 as 5 and 2 will make it easier to "see" the double.

- Have your child draw the same image again to show the double.



- Have your child spin the spinners a second time and draw the related double in the next section (Have your child try to draw a different double each time. He or she may need to spin the spinner more than once to get a new double. It is important for your child to decide if he or she already has drawn a given double.)
- Repeat by having your child spin the spinners and draw the related double in the next section on his or her paper.
- Have students complete the activity by spinning their spinners and drawing the related double a total of 8 times (4 drawings on the front of the paper and 4 drawings on the back).
- After your child has finished drawing 8 different doubles, have him or her go back and label the drawings. For example,



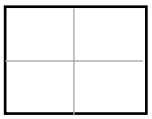
double 30 and double 7
37 + 37 = 60 + 14 = 74

Note: We do not need to "carry" a one to find the answer. We will teach that strategy (regrouping) in a later grade. In Grade 2 it is very important that your child understands the combining of like places for later work with fractions and algebra. It is important for your 2nd grader to think about how he or she can make the number using the fewest number of Base 10 pieces. In our example, 14 ones can be thought of as a 10 and 4 ones. Thinking of equivalent ways to make the same number, instead of "carrying" 1s will help students be more successful when learning to add and subtract fractions and mixed numbers.

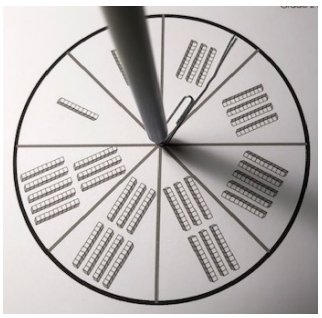
Activity 3—Draw the double + 1—2-digit numbers

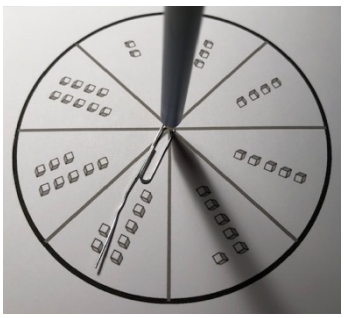
Prep: Print the Grade 2 Spinners page. Partially unfold paper clips to use as spinners. Gather a pen or pencil and a sheet of paper.

- Have your child fold a sheet of paper into 4 equal sections.

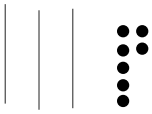


- Have your child spin the Base 10 decade spinner and the Base 10 ones spinner.

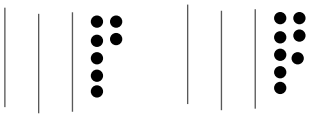




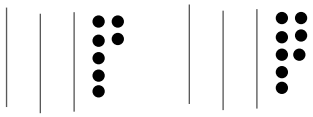
- To simplify the drawings of 2-digit numbers, have your child draw a | for 10 and a • for 1.
- In the first section of the paper, have your child draw what is on the spinner sections where the paper clips are pointing.



- Have your child draw the same image again to show the double and then add one more dot to the drawing.



- Have your child spin the spinners a second time and draw the related double + 1 in the next section (Have your child try to draw a different double each time. He or she may need to spin the spinner more than once to get a new double. It is important for your child to decide if he or she already has drawn a given double.)
- Repeat by having your child spin the spinners and draw the related double + 1 in the next section of his or her paper.
- Have students complete the activity by spinning their spinners and drawing the related double + 1 a total of 8 times (4 drawings on the front of the paper and 4 drawings on the back).
- After your child has finished drawing 8 different doubles + 1 problems, have him or her go back and label the drawings. For example,



double 30 and double 7
and 1 more
37 + 38 = 60 + 14 + 1 = 75

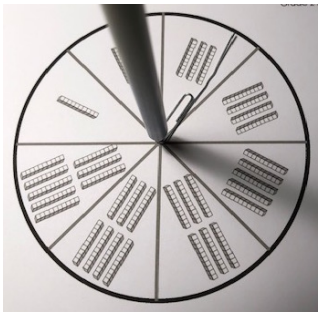
Note: We do not need to "carry" a one to find the answer. I can think about how I can make the number using the fewest number of Base 10 pieces. In our example, instead of using 15 ones, I would use a 10 and 5 ones. Thinking of equivalent ways to make the same number, instead of "carrying" 1s will help students be more successful when learning to add and subtract fractions and mixed numbers.

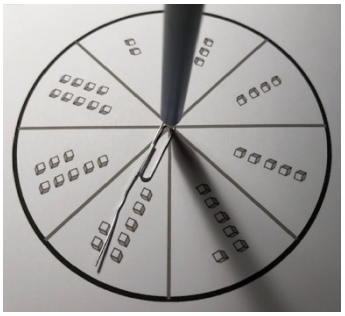
Activity 4—Draw the double – 1—2-digit numbers

Prep: Print the Grade 2 Spinners page. Partially unfold paper clips to use as spinners. Gather a pen or pencil and a sheet of paper.

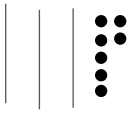
- Have your child fold a sheet of paper into 4 equal sections.

- Have your child spin the Base 10 decade spinner and the Base 10 ones spinner.

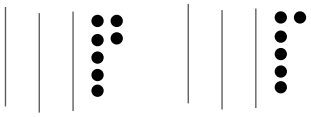




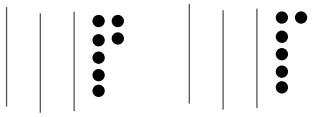
- To simplify the drawings of 2-digit numbers, have your child draw a | for 10 and a • for 1.
- In the first section of the paper, have your child draw what is on the spinner sections where the paper clips are pointing.



- Have your child draw the same image again but with one fewer one to show the double – 1.



- Have your child spin the spinners a second time and draw the related double – 1 in the next section. (Have your child try to draw a different double each time. He or she may need to spin the spinner more than once to get a new double. It is important for your child to decide if he or she already has drawn a given double.)
- Repeat by having your child spin the spinners and draw the related double – 1 in the next section of his or her paper.
- Have students complete the activity by spinning their spinners and drawing the related double – 1 a total of 8 times (4 drawings on the front of the paper and 4 drawings on the back).
- After your child has finished drawing 8 different doubles – 1 problems, have him or her go back and label the drawings. For example,



double 30 and double 7
and 1 fewer
37 + 36 = 60 + 14 – 1 = 73

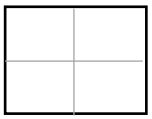
Note: We do not need to "carry" a one to find the answer. I can think about how I can make the number using the fewest number of Base 10 pieces. In our example, instead of using 13 ones pieces I could use with a 10 and 3 ones. Thinking of equivalent ways to make the same number, instead of "carrying" 1s will help students be more successful when learning to add and subtract fractions and mixed numbers.

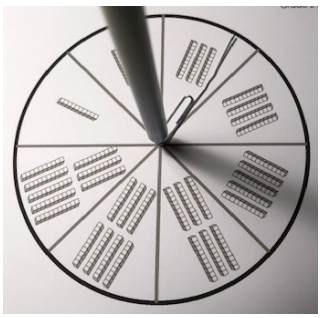
These same activities can be done for doubles + 2 and doubles – 2 problems. They can also be extended to 3-digit numbers.

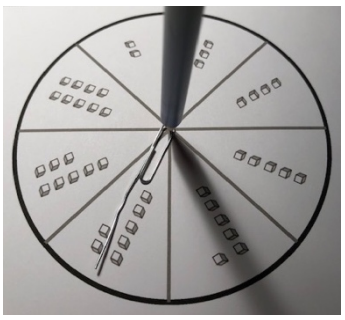
Activity 5—Combining like places

It is important for your child to 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). What is required is that like places are combined. At times there will be simpler ways to make the same quantity using fewer base 10 pieces. This understanding will help your child when they have to combine like sized pieces (denominators) when adding fractions and like terms when they get to algebra.

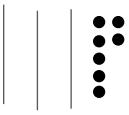
Prep: Print the Grade 2 Spinners page. Partially unfold paper clips to use as spinners. Gather a pen or pencil and a sheet of paper.

- Have your child fold a sheet of paper into 4 equal sections. 
- Have your child spin the Base 10 decade spinner and the Base 10 ones spinner.

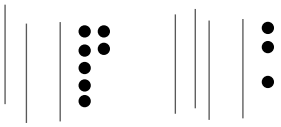




- To simplify the drawings of 2-digit numbers, have your child draw a | for 10 and a • for 1.
- In the first section of the paper, have your child draw what is on the spinner sections where the paper clips are pointing.

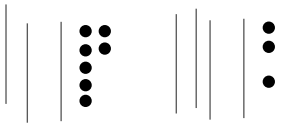


- Have your child spin the spinners a second time to get a second 2-digit number. Have your child also draw the second image in the first section of the paper.



- Have your child spin the spinners to create a second problem draw the related pictures in the next section (Have your child try to draw a different problem each time. He or she may need to spin the spinner more than once to get a new problem. It is important for your child to decide if he or she already has drawn a given problem.)
- Repeat by having your child spin the spinners and draw the related problem in the next section of his or her paper.
- Have students complete the activity by spinning their spinners and drawing the related problems a total of 8 times (4 drawings on the front of the paper and 4 drawings on the back).

- After your child has finished drawing 8 different problems, have him or her go back and label the drawings. For example,



30 + 40 = 70
7 + 3 = 10
37 + 43 = 80

Note: We do not need to "carry" a one to find the answer. I can think about how I can make the number using the fewest number of Base 10 pieces. Thinking of equivalent ways to make the same number, instead of "carrying" 1s will help students be more successful when learning to add and subtract fractions and mixed numbers.

Section 2—Parent Information
Subtraction Strategies and Drawings

Our goals for your child are for her or him to be:

- playful with numbers,
- flexible in the way she or he adds or subtracts numbers,
- efficient and accurate when she or he adds or subtracts.

Many of us learned a single strategy for adding numbers and a related strategy for subtracting numbers. We often heard the words "carry" and "borrow". These strategies always work but they aren't always the most efficient. Your child will learn these strategies in later grades. In grade 2, we want your child to learn and be fluent with other strategies including those shown below. We also want them to understand why a chosen strategy works, including the ones that we learned. I will include terms you may see in other resources. I hope this will help you make sense of these strategies and terms.

We'll begin with strategies using the Base 10 manipulatives. Whenever possible, it is important for your child to represent the problem with the actual materials, draw a picture to match, then write the related equations.

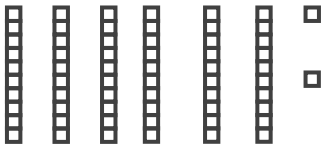
Round and Adjust

This strategy is one of the most efficient strategies for solving problems such as 62–29, 33–18, 184–57.

Example 1: 62 – 29

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

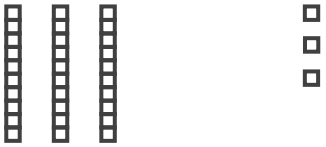
Materials



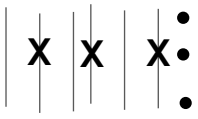
Drawings

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



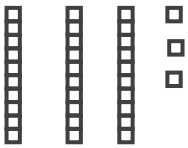
I removed 3 tens, or 30, and gave back 1. (Note: It doesn't matter which of the 10s are removed or crossed out.)

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

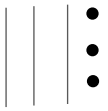
Example 2: 33 – 18

Begin with showing 33 using Base 10 materials (with materials and as a drawing).

Materials

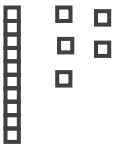


Drawings

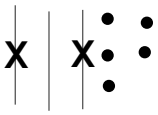


To remove 18, we can just remove 20 and then give back 2. We rounded the 18 to 20 and then needed to adjust (give 2 back) because we took away 2 too many. We can again think about this problem using money. Suppose you have 3 dimes and 3 pennies. You buy something that costs 18¢. You don't trade a dime for 10 pennies. You give the cashier 2 dimes. They give you back 2 pennies. The illustrations below show the changes in our materials and drawing after using this strategy.

Materials



Drawings



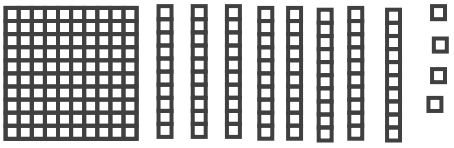
I removed 2 tens, or 20, and gave back 2. (Note: It doesn't matter which of the 10s are removed or crossed out.)

$$33 - 18 = 33 - 20 + 2 \text{ or } 15$$

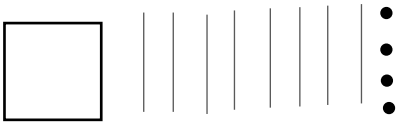
Example 3: 184 - 57

Begin with showing 184 using Base 10 materials (with materials and as a drawing).

Materials

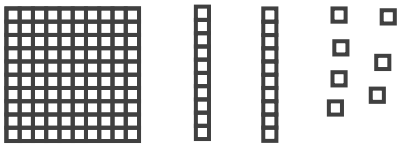


Drawings

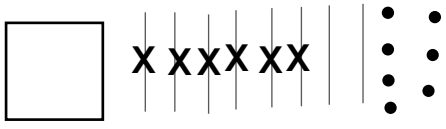


To remove 57, we can remove 60 and then give back 3. We rounded 57 to 60 and then needed to adjust (give 3 back) because we took away 3 too many.

Materials



Drawings



I removed 6 tens, or 60, and gave back 3. (Note: It doesn't matter which of the 10s are removed or crossed out.)

$$184 - 57 = 184 - 60 + 3 \text{ or } 127$$

Use Place Value and Decompose a 10

This strategy uses 2 different understandings.

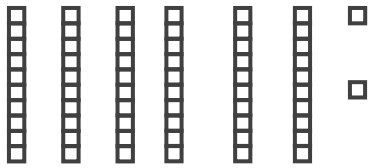
- One understanding is that we can represent numbers using place value. For example, 29 is 20 and 9, 18 is 10 and 8, 57 is 50 and 7. When written as 29 = 20 + 9, 18 = 10 + 8, 57 = 50 + 7 it is called expanded form of a number.
- The other understanding is that we can split a 10 into 2 parts in many different ways.

Let's use this strategy for 62 – 29 and 33 – 18. This strategy can also be used for 184 – 57.

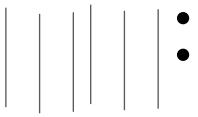
Example 1: 62 – 29

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

Materials

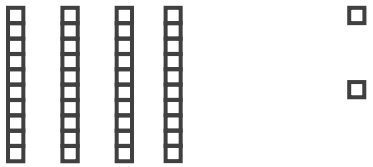


Drawings

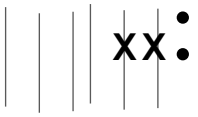


We think of 29 as 20 and 9. First remove 20.

Materials

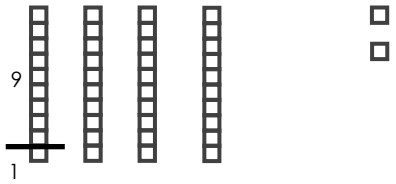


Drawings

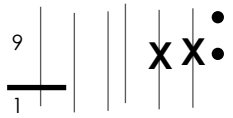


We don't have 9 ones to remove so we "cut" a 10 into 9 and 1 (Note: It doesn't matter which 10 we cut into 2 pieces).

Materials

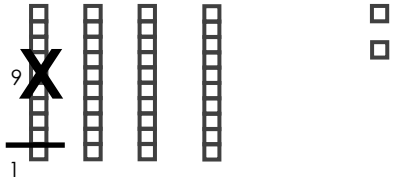


Drawings

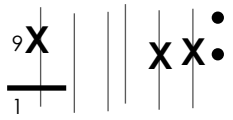


We "remove" the 9 and we are left with the answer.

Materials



Drawings

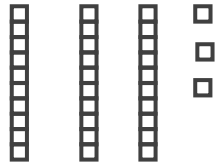


62 – 29 = 62 – 20 – 9 or 33

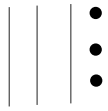
Example 2: 33 – 18

Begin with showing 33 using Base 10 materials (with materials and as a drawing).

Materials

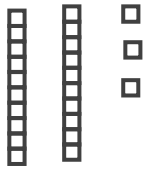


Drawings

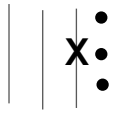


We think of 18 as 10 and 8. First remove 10.

Materials

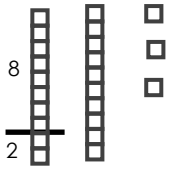


Drawings

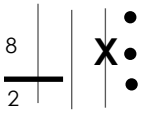


We don't have 8 ones to remove so we "cut" a 10 into 8 and 2 (Note: It doesn't matter which 10 we cut into 2 pieces).

Materials

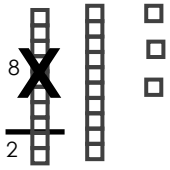


Drawings

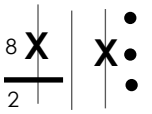


We "remove" the 8 and we are left with the answer.

Materials



Drawings



33 – 18 = 33 – 10 – 8 or 15

Use Place Value, Part-Part-Total, and Decompose a 10

This strategy uses 3 different understandings.

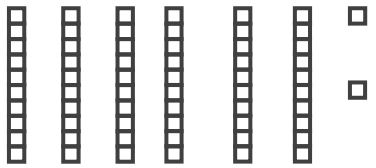
- One understanding is that we can represent numbers using place value. For example, 29 is 20 and 9, 18 is 10 and 8, 57 is 50 and 7. When written as 29 = 20 + 9, 18 = 10 + 8, 57 = 50 + 7 it is called expanded form of a number.
- Some children like to first remove the ones that they have. For 62 – 29, they understand that 62 is made up of 6 tens and 2 ones. They understand that 9 is the same as 2 and 7, 9 = 2 + 7. They first remove the 2 from the 62.
- They also understand that a 10 can be split into 2 parts. For our example, 62 – 29, they still need to remove 7 ones. They split a10 into 7 and 3 to get the rest of the ones that still need to be removed.

Let's use this strategy for 62 – 29 and 33 – 18. This strategy can also be used for 184 – 57.

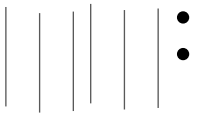
Example 1: 62 – 29

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

Materials

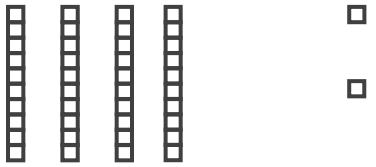


Drawings

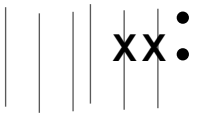


We think of 29 as 20 and 9. First remove 20.

Materials

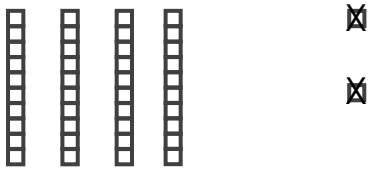


Drawings

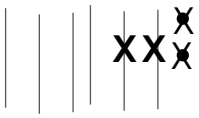


We don't have 9 ones to remove but we do have 2 ones. Remove the 2 ones.

Materials

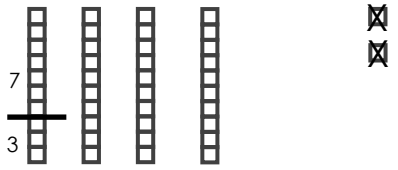


Drawings

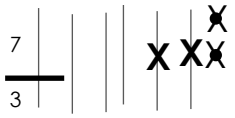


We still need to remove 7. At this point we've thought of 9 as 2 + 7 (Part-part-total; part 1 is 2, part 2 is 7, total is 9). So we "cut" a 10 into 7 and 3 (Note: It doesn't matter which 10 we cut into 2 pieces).

Materials

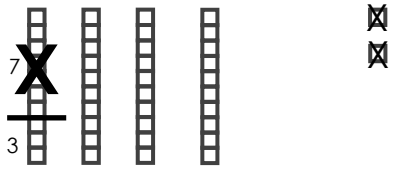


Drawings

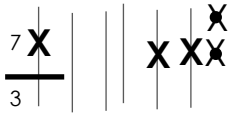


We "remove" 7 more and we are left with the answer.

Materials



Drawings

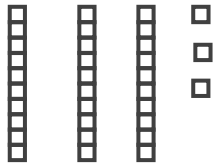


62 – 29 = 62 – 20 – 2 – 7 or 33

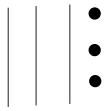
Example 2: 33 – 18

Begin with showing 33 using Base 10 materials (with materials and as a drawing).

Materials

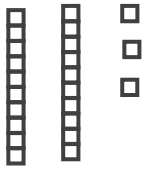


Drawings

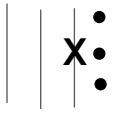


We think of 18 as 10 and 8. First remove 10.

Materials

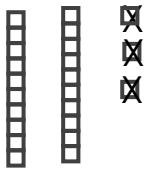


Drawings

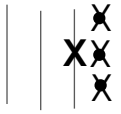


We don't have 8 ones to remove but we do have 3 ones. Think of 8 as 3 and 5. Remove the 3 ones.

Materials

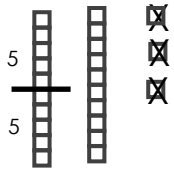


Drawings

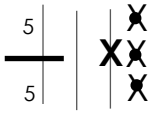


We still need to remove 5. At this point we've thought of 8 as 3 + 5 (Part-part-total; part 1 is 3, part 2 is 5, total is 8). So we "cut" a 10 into 5 and 5 (Note: It doesn't matter which 10 we decompose into 2 pieces).

Materials

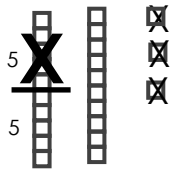


Drawings

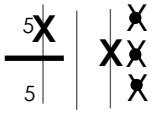


We "remove" 5 more and we are left with the answer.

Materials



Drawings



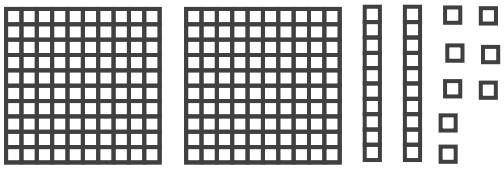
33 – 18 = 33 – 10 – 3 – 5 or 15

Use Place Value and Decompose a 10 or 100

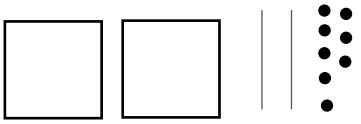
The strategies used above can also be used to solve problems such as 228 – 83. For this problem we will think of 83 as 80 and 3.

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

Materials

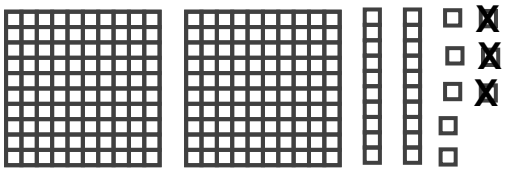


Drawings

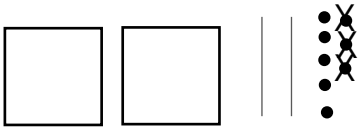


We think of 83 as 80 and 3. We can first remove either 80 or 3. Since we have 8 ones let's remove the 3 ones first.

Materials

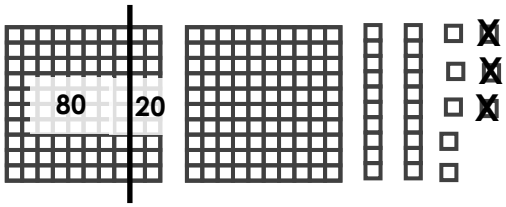


Drawings

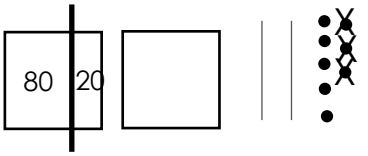


We don't have 8 tens to remove so we "cut" a 100 into 80 and 20 (Note: It doesn't matter which 100 we cut into 2 pieces).

Materials

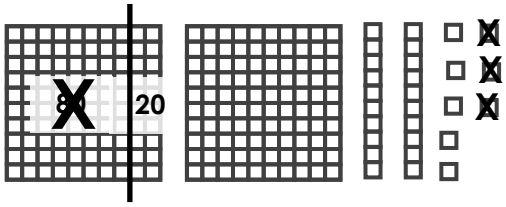


Drawings

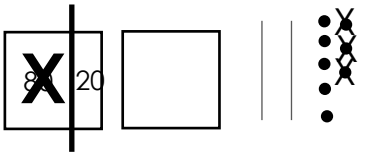


We "remove" 80 and we are left with the answer.

Materials



Drawings



228 – 83 = 228 – 3 – 80 or 145

Think of Subtraction as How Many More—Missing Addend

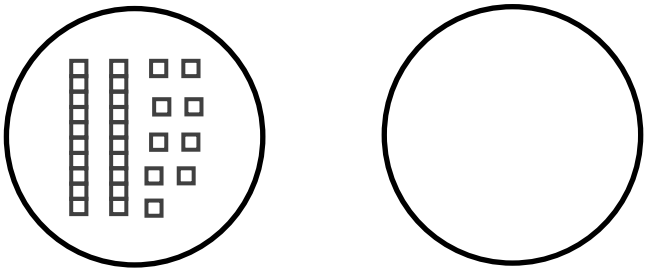
This strategy is very important for solving fraction subtraction problems in later grades. Using this strategy we think of problems such as 62 – 29 as how many more than 29 is 62 or how many do we need to add to 29 to get to 62.

$$29 + \_\_\_ = 62.$$

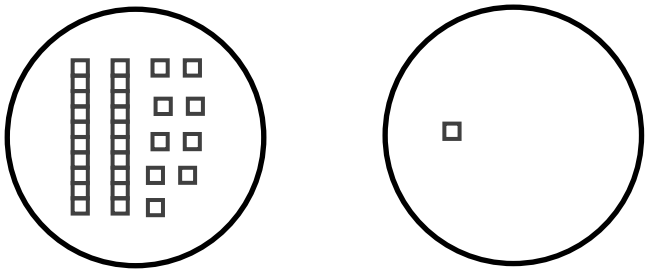
In Part 1 I'll show a missing part strategy for finding the answer using our Base 10 pieces. In Part 2, I'll show a counting on strategy using a number line.

Think of Subtraction as How Many More—Missing Addend—Part 1-Finding the Missing Part

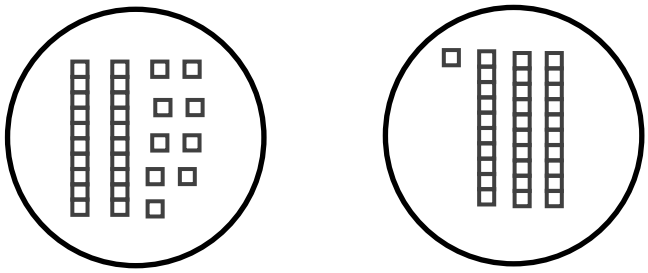
To solve 29 + ___ = 62 (or 62 – 29) using a missing part strategy, use 2 plates or sheets of paper and the Base 10 materials. Begin with representing the part you know (29) on one plate or sheet of paper. (In our example I placed what we know on the left "plate". We will put the pieces for the missing part on the empty "plate" (on the right).



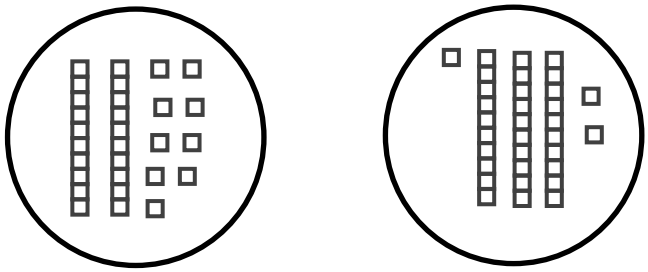
On the second plate we add 10s and 1s until we reach the total (62). For example, if we add a 1, we have a total of 30. (**Note:** I don't have to begin by adding ones. I could put tens on the plate first until I get close to the goal number.)



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**

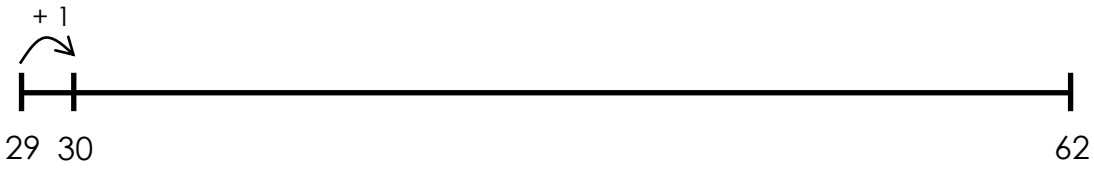
Think of Subtraction as How Many More—Missing Addend—Part 2-Counting Up

To solve 29 + ___ = 62 (or 62 – 29) using a counting on strategy, we begin with a number line with the start number on the left and the goal number on the right.

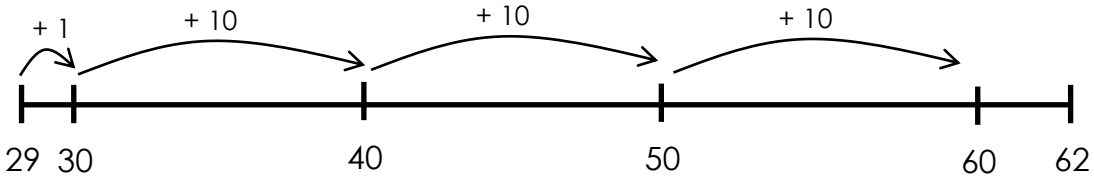
The goal is to find the distance between 29 and 62 by making jumps. Note: There are many different ways to "jump" from 29 to 62.

Example 1

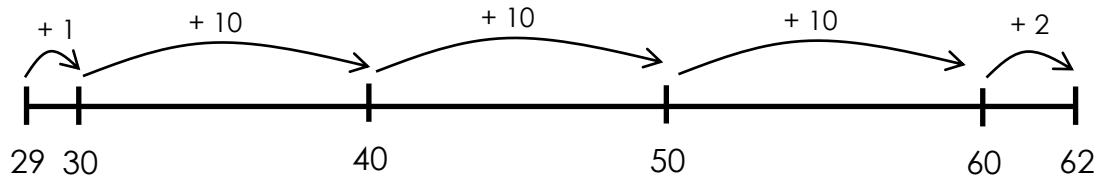
We can make a jump of 1 to get to 30 (Count up 1).



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).



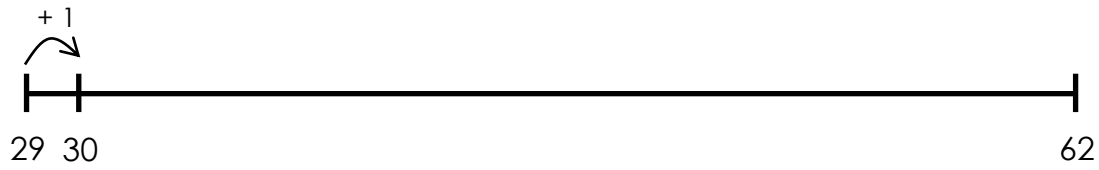
We combine the jumps to get the missing addend.

$$29 + \underline{\mathbf{1 + 10 + 10 + 10 + 2}} = 62$$
$$29 + \underline{\mathbf{33}} = 62 \quad \text{so} \quad 62 - 29 = \underline{\mathbf{33}}$$

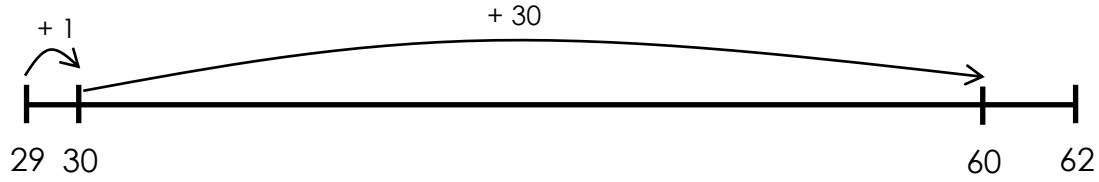
Example 2

There are many ways that we can jump from 1 to 62. We hope that your child will find more efficient ways to jump than by 1s.

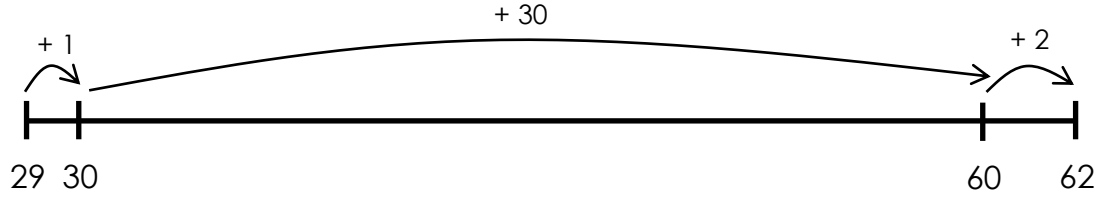
We can make a jump of 1 to get to 30 (Count up 1).



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.

$$29 + \underline{\mathbf{1 + 30 + 2}} = 62$$
$$29 + \underline{\mathbf{33}} = 62 \quad \text{so} \quad 62 - 29 = \underline{\mathbf{33}}$$

Example 3

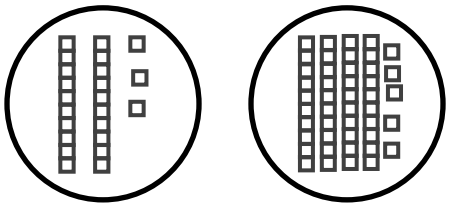
Some children will first jump 30 from 29 to get to 59. They then make jumps of 1 or a 1 and a 2 to get to 62.

Section 3—Child Activities

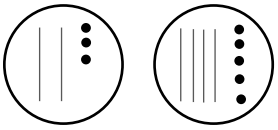
Subtraction Activities

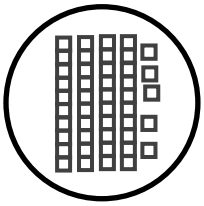
Materials: Base 10 materials, 2 paper plates or sheets of paper, Grade 2 spinner page, paper clips, something to draw with and draw on.

Activity 1—Subtraction as removing objects

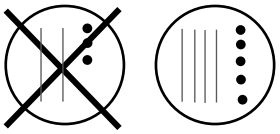


- Spin the spinners to get a 2-digit number (e.g., 68).
- Ask your child to show using Base 10 pieces.
- Have your child separate the pieces between the 2 plates (or sheets of paper).
- Have your child draw a picture on paper to match the plates.

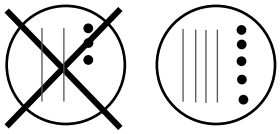




- Remove one of the plates.
- Have your child cross out the plate that was removed (on their drawing).



- Under their drawing, have your child write a subtraction problem to match (68 – 23 = 45).

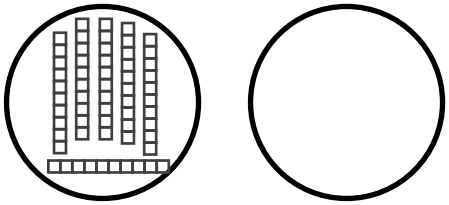


68 – 23 = 45

- Have your child find another way to separate the same quantity (For example, 44 and 24, 38 and 30, 20 and 48, etc.).
- Repeat the above steps.
- Have your child make 8 different problems for the same starting number (in our example, 68).

Repeat the above activity for a different 2-digit number on a different day.

Activity 2—How many more to make 100? Introduction to Missing Addend (Finding the missing part is another way to think about subtraction). Part 1-Tens only



- Place 10 tens (Base 10 tens) in front of your child.
- Have your child count by tens to find the total.
- Have your child cover their eyes.
- Place some of the tens on one of the plates and the rest of the tens hidden under the other plate. (For example, place 6 tens on one plate. Hide 4 tens under the other plate by turning the plate over.)
- Write the problem showing a missing piece (addend). For our example it would be

$$60 + \square = 100$$

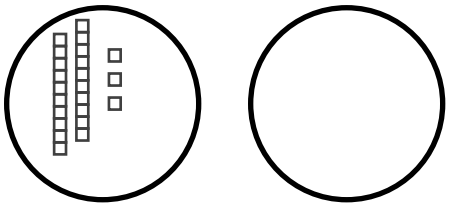
- Ask your child, "How many are hidden under the plate?"
- Have your child fill in the box with the answer.

$$60 + \boxed{40} = 100$$

- Have your child look under the plate to check his or her answer.
- Repeat the above steps, hiding a different number under the plate (For example, show 3 tens and hide 7 tens under the plate).

Repeat the above activity for a different 2-digit number on a different day. Remember we are only working with tens for this activity.

Activity 3—How many more to make a number? Introduction to Missing Addend (Finding the missing part is another way to think about subtraction). Part 2-Any 2-digit number



- Place some tens and ones (Base 10 materials) in front of your child.
- Have your child count to find the total.
- Have your child cover their eyes.
- Place some of the pieces on one of the plates and the rest of the pieces hidden under the other plate. (Suppose the starting number is 47. Place 2 tens and 3 ones on one plate. Hide 2 tens and 4 ones under the other plate by turning the plate over.)
- Write the problem showing a missing piece (addend). For our example it would be

$$23 + \square = 47$$

- Ask your child, "How many are hidden?"
- Have your child fill in the box with the answer.

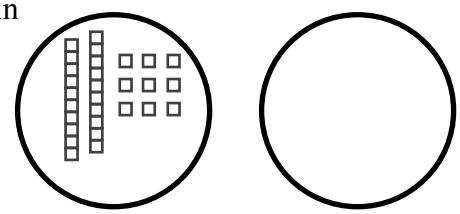
$$23 + \boxed{24} = 47$$

- Have your child check under the plate to check his or her answer.
- Repeat the above steps, hiding a different number under the plate (For example, show 3 tens and 6 ones and hide 1 ten and 1 one under the plate).

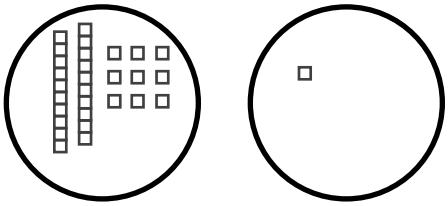
Activity 4—How many more to make a number? Missing Addend (Finding the missing part is another way to think about subtraction). Part 3-Any 2-digit number

Materials: Base 10 materials, 2 paper plates or sheets of paper, paper and pencil

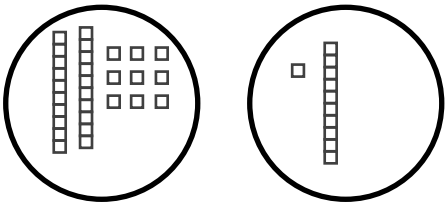
- Place some tens and ones (Base 10 materials) on the table in front of your child.
- Have your child count to find the total.
- Have your child cover their eyes.
- Place pieces on one of the plates that has more ones than the starting number has. (Suppose the starting number is 47. Place 2 tens and 9 ones on one plate OR 3 tens and 8 ones, OR 1 ten and 9 ones.)



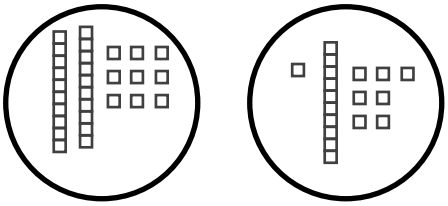
- Have your child place the additional pieces needed to make 47 on the empty plate. For example, she or he could put a 1 on the plate which would get a total of 30.
- Have your child say the new totals aloud as he or she places the pieces. For example, after putting the 1 on the second plate your child would say, "30".



- She or he could then put a 10 on the plate to get a total of 40. Your child would now say, "40".



- She or he would then put an additional 7 ones on the plate to get a total of 47. As your child adds a 1 one at a time, he or she would say aloud, "41, 42, 43, 44, 45, 46, 47". In this way, your child is counting on.



- Write the problem showing a missing piece (addend). For our example it would be

$$29 + \square = 47$$

- Ask your child, "How many did you have to add to your plate?"
- Have your child fill in the box with the answer.

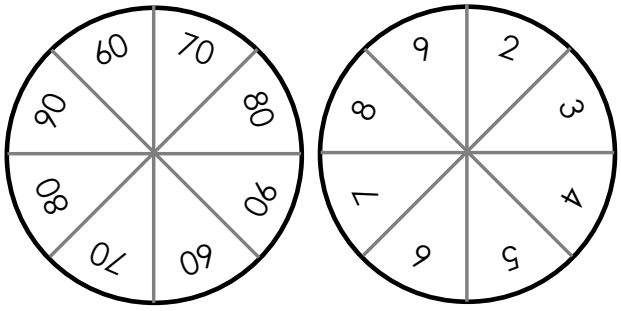
$$29 + \boxed{18} = 47$$

Repeat the above activity for a different 2-digit number on a different day.

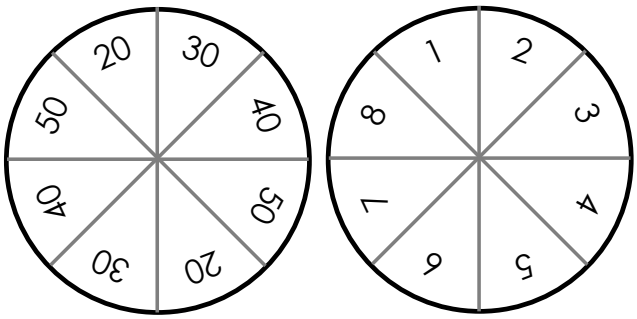
Activity 5—Using multiple strategies to subtract

Materials: Base 10 materials (optional), Grade 2 Subtraction Spinners page, paper clips, something to draw with and draw on.

- Have your child spin the spinners on the top of the Subtraction Spinners page to get the starting 2-digit number.



- Have your child draw a picture to show the starting number.
- Spin the spinners on the bottom of the page to get the amount to remove.



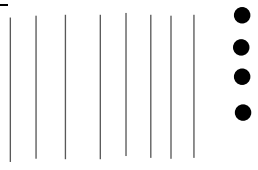
- Have your child draw pictures to show multiple ways to remove the number.

For specific subtraction strategy examples, see ***Subtraction Strategies and Drawings, Section 2—Parent Information.

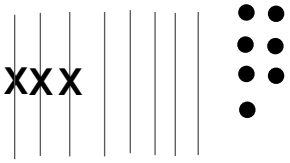
Suppose the starting number is 84 and the amount to remove is 27.

<u>Example 1—Using a Round and Adjust Strategy***</u>

- Begin by drawing the starting number.

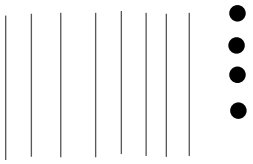


- Remove 30 and give back 3.
- So 84 – 27 = 84 – 30 + 3 or 57

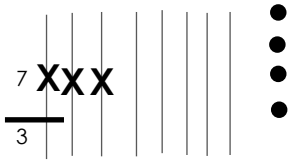


Example 2—Using Place Value and Decomposing a 10 Strategy***

- Begin by drawing the starting number.

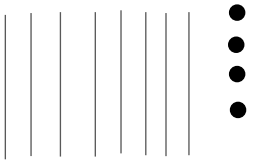


- Think of 27 as 20 and 7.
- Remove 20. Cut a 10 into 7 and 3.
- Remove 7
- So 84 – 27 = 84 – 20 – 7 or 57

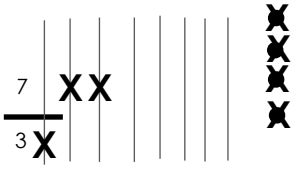


Example 3—Using Place Value, Part-Part-Total, and Decomposing a 10 Strategy***

- Begin by drawing the starting number.

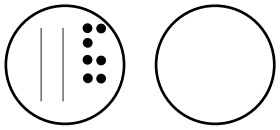


- Think of 27 as 20 and 7.
- Think of 7 as 4 + 3 so that you can first remove 4.
- Remove 20. Remove 4.
- Cut a 10 into 7 and 3.
- Remove 3.
- So 84 – 27 = 84 – 20 – 4 – 3 or 57

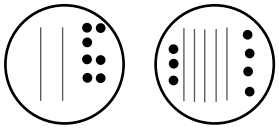


Example 4—Find the missing part (addend) ***

- Think of 84 – 27 as 27 + ___ = 84.
- Begin by drawing 27 in one circle.



- Count on from 27 by adding 10s and 1s in the other circle until you reach 84.

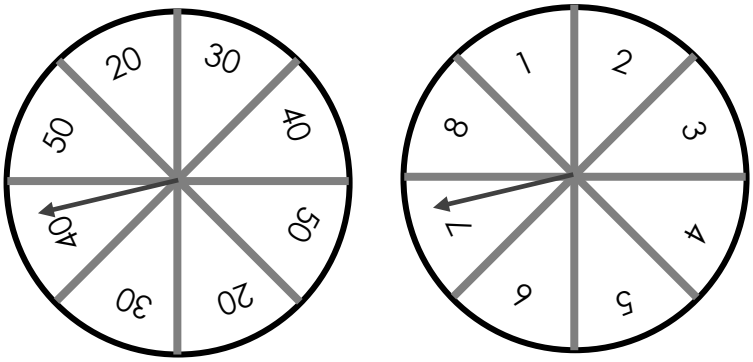


- The amount in the 2nd circle is the missing addend.
- 27 + 57 = 84 so 84 – 27 = 57

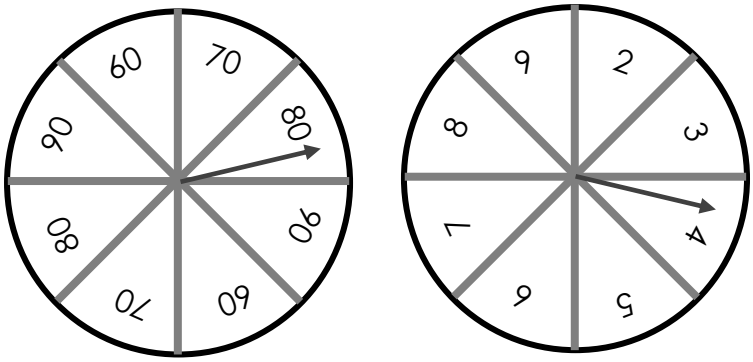
Activity 3—How many jumps? How far apart? (Building subtraction as difference or comparison.)

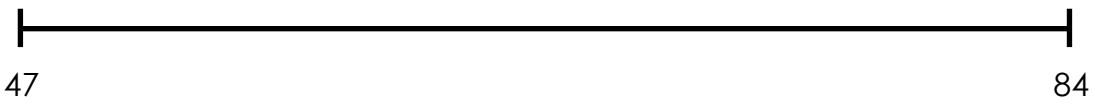
Materials: Grade 2 Subtraction Spinners page, paper clips for spinners.

- Have your child draw a number line.
- Have your child spin the spinners on the bottom of the Subtraction Spinners page to get a 2-digit starting number. Write the number on the left endpoint of the number line.



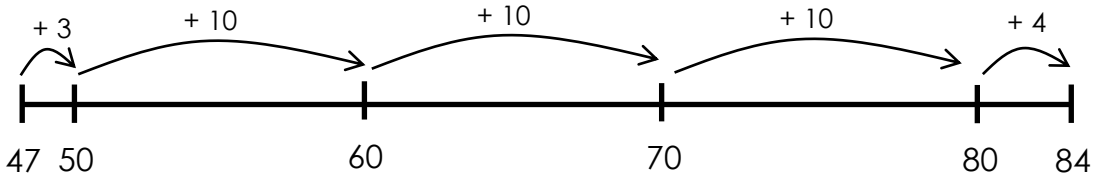
- Have your child spin the spinners on the top of the Subtraction Spinners page to get a 2-digit goal number. Write the number on the right endpoint of the number line.





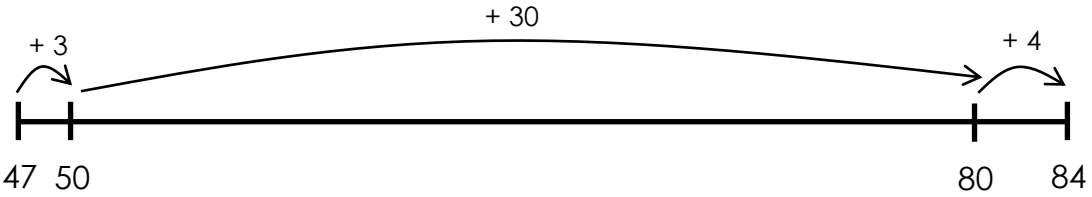
- Your child is to find how far apart the 2 numbers are by making jumps. He or she is finding how many more than 47 is 84. 47 + ____ = 84
- Have your child draw a picture to show the jumps and write the related missing addend equation.
- Have your child see if they can find the answer in more than one way.

Example 1



- Have your child fill in the blank with the jumps? (e.g., 47 + 3 + 10 + 10 + 10 + 4 = 84 or 47 + 37 = 84.

Example 2



- Have your child fill in the blank with the jumps? (e.g., 47 + _3 + 30 + 4_ = 84 or 47 + _37_ = 84.

Repeat the above activity for other start and goal numbers on a different day.

Money Activities

Activity 1—Exploring coins

Materials: Several of each coin (quarter, dime, nickel, penny). It is important for children to examine pennies with different images on the tails side of the coin, nickels and quarters with different images on the heads and tails side. A magnifying glass if available (not necessary).

During this activity we want your child to notice the things that are the same and different between the coins. It is important for your child to understand that all coins are filled with information (US and international coins).

- Give your child some time to look at the penny.
- Ask your child what they saw on the penny (e.g., date, man, "In God We Trust", "e pluribus unum", building, one cent, etc.).
- For each item that your child names, have your child check to see if these items are also on the nickel, dime, and quarter. Ask follow-up questions to help your child take a closer look at the coins. For example,
    - **Date**: Is the date on each coin? Is it in the same location? (Note: The state quarters have 2 dates, the year the coin was made and the year that state became a state.)
    - **Man**: Who is the man on the penny? (Lincoln) Is there a man on every coin? Who are they? (nickel—Thomas Jefferson; dime—Franklin Delano Roosevelt; Quarter—George Washington). Do they all face the same direction?
    - **In God We Trust** and **E Pluribus Unum**: On every coin? Same location?
    - **Building**: Does each coin have a building? What are the buildings? (penny—Lincoln Memorial, on a newer coin you can see Lincoln sitting in the Memorial; Nickel—Monticello, President Jefferson's home)
    - **One cent**: Is the value of the coin written on each coin? In the same location?

Activity 2—Race to a $1; Race to $3

Materials: A pair of dice (you can also use one of the spinners showing 2 to 9); A mix of coins (at least 20 pennies) totaling $2 ($6 if playing Race to $3).

This game can be played with 2 or more players. If there are more than 2 players, you will need more coins.

To play:

- Place the mixed coins (the bank) in the middle of the playing space.
- Player 1 rolls the dice and takes that value in coins. For example, if a player rolls 8, he or she could take 8 pennies or a nickel and 3 pennies. If the player already has pennies, he or she could take a dime and give back 2 pennies.
- Player 2 rolls the dice and takes that value in coins.
- Players continue to take turns until a player reaches $1 (or $3).

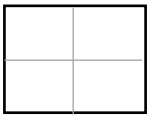
Note: Players may need to make exchanges if they run out of certain coins. For example, if all of the pennies are gone from the pile, a player could trade in 10 of their pennies for a dime.

Activity 3--All of the ways to make ____ cents

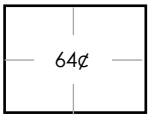
It is important for your child to understand that there are many different ways to make a given coin value. For example, 64¢ can be made with 6 dimes and 4 pennies, 4 dimes and 24 pennies, 2 quarters, a dime, and 4 pennies, etc. This understanding and flexibility in showing coin values in a variety of ways will help them when purchasing items and when solving money story problems.

Materials: Mixed coins (not necessary), Grade 2 Spinners, paper clip, blank paper, pencil or crayon

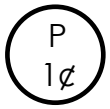
- Have your child fold a sheet of paper into 4 equal sections.



- Spin each spinner once to get a 2-digit number. That number will represent the number of cents the child is to make.
- Have your child write the number in the center of the paper.

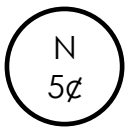


- To simplify the drawings of coins, have your child draw,



for penny

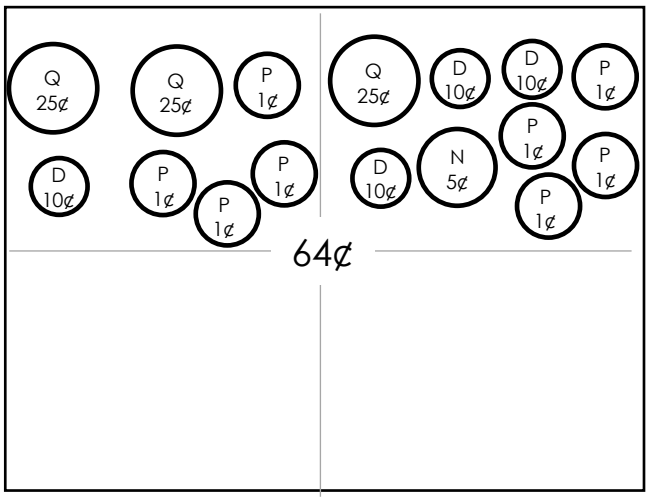
for dime



for nickel

for quarter

- Have your child draw as many different pictures as they can (one per section) for the given value.



Repeat for other values on other days.

Measurement Activities

Time: It is important for your child to accurately tell time to 5 minutes 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). 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.

Some important things for your child to notice.

1. At half past the hour, the hour hand is halfway between 2 numbers on the clock.
2. At a quarter past the hour, the hour hand is a quarter of the way between 2 numbers on the clock.

The more your child practices telling time, the better they will get.

Activity 1—Drawing a clock

Drawing a clock helps your child focus on the location and spacing of the numbers. It will also help with understanding half past as halfway around the clock, a quarter past is a quarter of the way around the clock, and a quarter til is a quarter of the way until you get to the next hour. As children, many of us have drawn clocks on paper plates. Have your child draw a clock on a paper plate or have them draw a circle and then draw the clock. This is challenging for many children. It is important that they have repeated practice.

- For this activity, show a clock face that is numbered 1 to 12.
- Have your child look at the clock and try to draw what they see.
- Notice that the 12 is at the top.
- Ask, "What number is opposite the 12?"
- Ask your child to name another number that she or he notices (e.g., 3)
- Ask what number is opposite the chosen number.
- Repeat until the clock is completely drawn.

Have your child practice drawing a clock periodically. It takes time for children to become proficient with this skill.

Activity 2—What I can do in a minute?

- Have your child predict the number of times they can do each item below and then test their prediction. Do 1 or 2 of these items in a day.
  - Write your name
  - Write your phone number
  - Jumping jacks
  - Touch your toes
  - Write the number 937
  - Write the word, "thirteen"
  - High knee raises
  - Giant steps
  - Heel to toe steps

Have your child pick other items.

Activity 3--How long is a minute?

See if your child has a sense of how long a minute is. Below are some possible activities your child can do to develop this sense. There are many others. Be creative!

Materials: A stop watch is helpful but not necessary.

- Have your child close their eyes and then open them when they think one minute has passed. See how close they are.
- Have your child raise their hand above their head. Have them lower their hand when they think one minute has passed.
- Have your child stand on one foot. Have them lower their foot when they think one minute has passed.

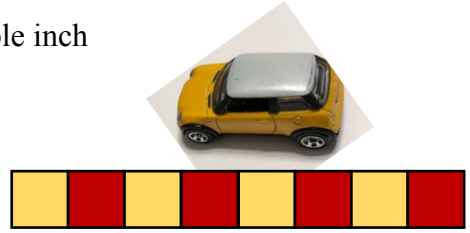
Activity 4—Find the Length

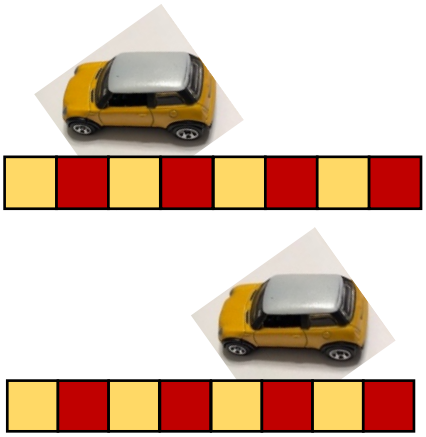
It is important for your child to recognize an inch, a foot, a yard, a centimeter, and a meter. In Grade 2 we use very simple measurement devices that help your child get a sense of those unit sizes before giving them a typical ruler, yard stick, meter stick, etc. However, the more your child measures items (helping you cook, sew, build things), the more proficient they become.

Materials: Simple inch only ruler (print and cut)

It is important for children to understand that you do not need to line up an object at zero to be able to measure the object. The object can be placed anywhere on the ruler. We can measure the object by counting the units (inches). A favorite test question is for children to state the measurement of an object using a "broken" ruler (The ruler is broken off at each end).

- Have your child gather 3 different objects they find in your home, yard, or neighborhood that are shorter than an adult's shoe.
- Have your child find the length of each object using the simple inch only ruler.





- Have your child measure the same object more than one time by placing it at different locations on the ruler.

- Ask, "Does the length change if you move it on the ruler?" (No)
- Have them draw a picture to show the length.
- Point to 2 of the objects. Ask, "Which is longer?"
- Ask, "How much longer?" (Your child should be able to use their measurements to answer this question.)
- Point to 2 different objects. Ask, "Which is shorter?"
- Ask, "How much shorter?"

On another day, have your child repeat this activity for objects longer than their arm span. Have them measure the object with a yardstick. In Grade 2, your child can use the back of a yardstick to help her or him focus on the length of a yard. If you do not have a yardstick measure a piece of string from the tip of your nose to the finger tip of your extended arm. This is approximately 1 yard.

Your child can do a similar activity on a different day using the back of a ruler to measure so that she or he can focus on the length of a foot. If you don't have a ruler handy fold your yard string into 3 equal pieces and use one of those lengths to approximate a foot.

Activity 5—Small units, big units

It is important for your child to understand that the bigger the unit you use to measure, the fewer you need. For example, it will take fewer giant steps to measure a distance than heel-to-toe steps.

- Have your child predict how many giant steps it will take to cross the room.
- Have your child walk across the room in giant steps counting the steps as they go.
- Have your child predict how many heel-to-toe steps it will take to cross the room.
- Have your child walk across the room using heel-to-toe steps counting the steps as they go.
- Ask, "What did you notice?" (For example, it took more heel-to-toe steps to walk across the room).
- Repeat for other distances (e.g., length of other rooms, across the yard, across a playground, down the block, etc.).
- Have your child draw a picture to show the items they measured and the number of steps needed.

Geometry Activities

Activity 1—Shape Hunt

- Have your child look for shapes in your home and in the neighborhood.
- Have your child draw pictures of what he or she finds. (**Note:** The shapes your child will find are all 3D shapes.)
- If possible, have your child name the shapes that she or he finds. For example, some common shapes include:

  Box shapes (such as cereal boxes, bookcases)—rectangular prisms
  Can shapes (cylinders)
  Ball shapes (spheres)
  Cones
  Pyramids

- Have your child name the 3D shape and then any 2D shapes within the 3D shape. For example, your child may see a safety cone. The 3D shapes within the safety cone are a cone and rectangular prisms. If you look at the top of the cone (bird's eye view) you see a circle. If you look at the base of the cone (worm's eye view) or the "footprint" it would make, you see a rectangle. In this case it is a special rectangle, a square.

Activity 2—Tangram Explorations

Prep: Print and cut out the tangram pieces.

- Have your child make different shapes or designs using 2 of the tangram pieces.
- Have your child draw a picture of each of the shapes or designs that they make.
- Have your child see how many different designs he or she can make with any 2 of the pieces.

Repeat using 3, 4, 5, 6 or all 7 of the pieces on different days.

Activity 3—Fair and square

- Have your child help you bake cupcakes or brownies.
- Have your child cut the brownie (or cupcake) to share with you so that it is a fair share.
- Have your child see if they can cut the brownie (or cupcake) into 2 equal pieces in more than one way.
- Have your child cut the brownie (or cupcake) so that 4 people would each get a fair share.
- Have your child see if they can cut the brownie (or cupcake) into 4 equal pieces in more than one way.
- Have your child cut the brownie (or cupcake) so that 3 people would each get a fair share.
- Have your child see if they can cut the brownie (or cupcake) into 3 equal pieces in more than one way.

Activity 4—Fair and square with play-dough

- Have your child mold the play-dough into a "brownie".
- Have your child cut the "brownie" into 2 equal pieces and draw a picture to match.
- Have your child see if he or she can cut their "brownie" into 2 different equal pieces in more than one way.
- Have him or her draw a picture to show each way that he or she cut the "brownie".
- Repeat for a circular play-dough "cookie." (He or she can use the play-dough container to cut out the "cookie.")
- If available, use cookie cutters to make other "cookie" shapes. Have your child see if he or she can cut the "cookie" into 2 equal pieces.

Repeat the above activity for 4 equal pieces on a different day.
Repeat the above activity for 3 equal pieces on a different day.