

## Lesson 7: Adding and Subtracting Big Numbers

### Getting Started

#### ? Big Ideas

- What strategies can we use to add and subtract?
- How does estimation help with problem solving?

#### 📖 Facts and Definitions

- **Estimate:** to guess

#### 🎯 Skills

- Fluently add and subtract multi-digit whole numbers using the standard algorithm
- Use place value understanding to round multi-digit whole numbers to any place

#### ✂️ Materials

- ✓ calculator
- ✓ whiteboard (kit)
- ✓ fine point dry-erase markers (kit)

### Introduction

During this lesson, your child will review adding and subtracting numbers to 1000 and will begin to add and subtract even larger numbers. As needed, allow him to refer to the "Working With Big Numbers" sheet that shows examples of composing 10 when adding and examples of borrowing when subtracting. He can store this sheet in his Interactive Notebook for future reference.

Ask your child to write and solve the following problems on the whiteboard (he should write them vertically):

- $546+378$  (924)
- $724-198$  (526)

When he's found the answers to the given problems, ask him to explain how he did so. He should talk about composing 10 and carrying when adding and borrowing when subtracting. If needed, give him the following problems for additional practice:

- $199+98$  (297)
- $487+318$  (805)
- $825-651$  (174)
- $636-473$  (163)

Next, ask your child to write  $637+748$  on the whiteboard, and ask, "Will the sum of these numbers be greater than or less than 1000?" and "How do you know?" Help your child see that he can round to estimate the answer. For example, if he rounds the numbers to the nearest 100 he should end up with  $600+700$  for an estimated sum of 1300. Now, show him how to complete the original addition problem by carrying the 1 from adding the digits in the hundreds places ( $6+7=13$ ) over the "invisible" thousands and then bringing the 1 down to the thousands place under the line to finish the sum.

Say, "Once you know how to line up your numbers correctly and carry to the next place, you can add really big numbers, even numbers in the millions."

### Activities

**Activity 1: Adding Three-Digit Numbers**

Provide time for your child to complete the problems at the following web link. Allow him to use the whiteboard and dry-erase markers as he works.

<b>Adding Three-Digit Numbers</b>
<a href="http://www.movingbeyondthepage.com/link/8299">www.movingbeyondthepage.com/link/8299</a>
<a href="https://www.movingbeyondthepage.com/quiz/age-8-10/adding-three-digit-numbers/">https://www.movingbeyondthepage.com/quiz/age-8-10/adding-three-digit-numbers/</a>

**Activity 2: Adding Even Bigger Numbers**

Your child will watch the video at the following web link. This video reviews some basics about multi-digit addition that he should already know and will introduce adding numbers that have more than three digits and adding three multi-digit numbers.

<b>Multi-Digit Addition</b>
<a href="http://www.movingbeyondthepage.com/link/7770">www.movingbeyondthepage.com/link/7770</a>
<a href="https://youtu.be/mAvuom42NyY">https://youtu.be/mAvuom42NyY</a>

Now, your child will complete the "Adding Big Numbers" sheet. When he's finished with the sheet, check his work, and review his mistakes with him.

**"Adding Big Numbers" Answer Key**

$798 + 573$ <p>Estimated sum (Round to the nearest 100):</p> $800 + 600 = 1400$ <p>Actual sum:</p> $\begin{array}{r} 798 \\ + 573 \\ \hline 1371 \end{array}$	$3527 + 1493$ <p>Estimated sum (Round to the nearest 1000):</p> $4000 + 1000 = 5000$ <p>Actual sum:</p> $\begin{array}{r} 3527 \\ + 1493 \\ \hline 5020 \end{array}$
$4628 + 588$ <p>Estimated sum (Round to the nearest 100):</p> $4600 + 600 = 5200$ <p>Actual sum:</p> $\begin{array}{r} 4628 \\ + 588 \\ \hline 5216 \end{array}$	$1567 + 458 + 321$ <p>Estimated sum (Round to the nearest 100):</p> $1600 + 500 + 300 = 2400$ <p>Actual sum:</p> $\begin{array}{r} 1567 \\ 458 \\ + 321 \\ \hline 2346 \end{array}$

**Activity 3: Subtracting Three-Digit Numbers**

Provide time for your child to watch the video at the following web link. In addition to reviewing the basics of multi-digit subtraction, this video discusses how to borrow when there are zeros in numbers.

**Multi-Digit Subtraction**

[www.movingbeyondthepage.com/link/8197](http://www.movingbeyondthepage.com/link/8197)

<https://youtu.be/Y6M89-6106I>

Now, provide time for your child to complete the "Subtracting Three-Digit Numbers" page. Allow him to use the whiteboard and dry-erase markers as he works.

**Activity 4: Subtracting Even Bigger Numbers**

Your child will use the random number generator that he used previously to create subtraction problems to be solved on the "Subtracting Big Numbers" sheet. Tell him to enter a lower limit of 100 and an upper limit of 10,000. Give him the sheet, the whiteboard, and dry-erase markers, and tell him to follow the instructions on the sheet. Explain that he should write the two numbers that the generator gives him on the whiteboard before he writes them on the sheet. As needed, remind him that he will subtract the smaller number from the larger number (the larger number goes on top). Make sure that he has access to a calculator so that he can check his work as directed.

**Random Number Generator**

[www.movingbeyondthepage.com/link/8300](http://www.movingbeyondthepage.com/link/8300)

<https://www.movingbeyondthepage.com/online/content/random-number-generator.aspx>

**Wrapping Up**

Tell your child to write an addition problem and a subtraction problem on the whiteboard, both of which include numbers with four or five digits. Ask him to describe how to find the sum and the difference, and make sure that he can accurately describe the steps in each of the processes.

# Working With Big Numbers

## Adding - Composing 10

Add the ones place.

$$(8 + 7 = 15)$$

Add the tens place

$$(1 + 9 + 1 = 11)$$

Add the hundreds place

$$\begin{array}{r} 198 \\ + 117 \\ \hline \end{array}$$

$$\begin{array}{r} 198 \\ + 117 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 198 \\ + 117 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 198 \\ + 117 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 198 \\ + 117 \\ \hline 315 \end{array}$$

## Subtracting - Borrowing

Look at the ones place. Is the number on top more or less than the number on the bottom?

Since 2 is less than 7 we need to borrow from our neighbor.

Now you can subtract the ones place (12 - 7 = 5)

Subtract the tens place next. Repeat the steps for borrowing if necessary. (13 - 6 = 7)

Subtract the hundreds place.

$$\begin{array}{r} 342 \\ - 167 \\ \hline \end{array}$$

$$\begin{array}{r} 342 \\ - 167 \\ \hline \end{array}$$

$$\begin{array}{r} 342 \\ - 167 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 342 \\ - 167 \\ \hline 75 \end{array}$$

$$\begin{array}{r} 342 \\ - 167 \\ \hline 175 \end{array}$$

# Adding Big Numbers

**Instructions:** Begin to find the sums by first using rounding to estimate each sum. Once you have the estimated sum, find the actual sum. Be sure to line the places up correctly as you write each problem!

$$798 + 573$$

**Estimated sum** (Round to the nearest 100):

**Actual sum:**

$$3527 + 1493$$

**Estimated sum** (Round to the nearest 1000):

**Actual sum:**

$$4628 + 588$$

**Estimated sum** (Round to the nearest 100):

**Actual sum:**

$$1567 + 458 + 321$$

**Estimated sum** (Round to the nearest 100):

**Actual sum:**

# Subtracting Three-Digit Numbers

**Instructions:** Solve the following problems.

$831 - 697 =$

$$\begin{array}{r} 992 \\ - 874 \\ \hline \end{array}$$

$534 - 295 =$

$$\begin{array}{r} 654 \\ - 471 \\ \hline \end{array}$$

**Instructions:** Answer the following questions. Be sure to show the subtraction problem before solving it.

1. Betty baked 225 cupcakes. She put vanilla frosting on 130 cupcakes and chocolate frosting on the rest. How many cupcakes had chocolate frosting?



2. A total of 362 people attended the soccer game. Jane counted 170 adults in the crowd. How many children attended the game?



3. Mrs. Smith counted the number of birds that visited her bird feeder each month. In March she counted 106, and in April she counted 211. How many more birds visited her bird feeder in April than in March?



# Subtracting



# Numbers

Instructions: Use the random number generator to generate 2 numbers, and then use the numbers to write a subtraction problem in one of the spaces provided on this sheet. Remember: Order matters in subtraction! Once you have the problem, find the difference. Fill each space with a subtraction problem and its difference.




Now, check your work using a calculator, and correct any problems that you miss.