

TOPIC 8

Subtract Multi-Digit Whole Numbers

OVERVIEW

Topic 8 focuses on fluency with subtracting whole numbers within 1,000.

FIND DIFFERENCES

Use Mental Math to Subtract Your child will use compensation and think addition to find differences using mental math.

Compensation

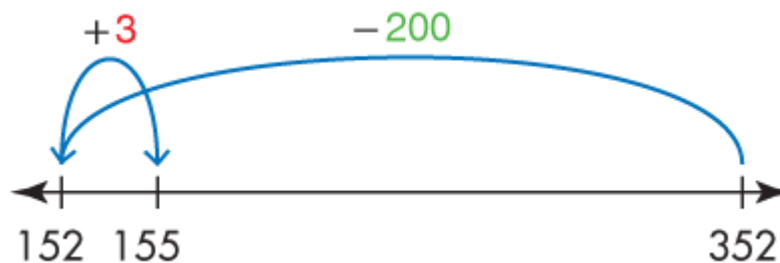
Find $352 - 197$.

197 is close to 200.

Subtract 200 (3 too much) and then add back 3.

$$300 - 200 = 100$$

$$100 + 55 = 155$$



So, $352 - 197 = 155$.

Think Addition

Find $352 - 197$.

Think $197 + ? = 352$.

$$197 + 3 = 200$$

$$200 + 100 = 300$$

$$300 + 52 = 352$$

$$3 + 100 + 52 = 155$$

So, $352 - 197 = 155$.

ESTIMATE DIFFERENCES

Use Rounding to Subtract Your child will practice estimating differences by rounding to the nearest 10 and to the nearest 100. Your child should begin to understand that the closer the rounded numbers are to the original numbers, the closer the estimated difference will be to the actual difference.

Here are two ways your child might solve the problem “493 concert tickets were sold. 126 people have arrived. About how many people with tickets have still not arrived?”

Round to the Nearest 100

$$\begin{array}{r} 493 \rightarrow 500 \\ - 126 \rightarrow 100 \\ \hline 400 \end{array}$$

About 400 people have not yet arrived.

Round to the Nearest 10

$$\begin{array}{r}
 493 \rightarrow 490 \\
 - 126 \rightarrow 130 \\
 \hline
 360
 \end{array}$$

About 360 people have not yet arrived.

SUBTRACTION ALGORITHMS

Record Partial Differences to Subtract Your child will use place value to break apart numbers and record a series of smaller subtraction problems, or partial differences.

This is how your child would use place value to break apart 181 to subtract.
Find $462 - 181$.

$$181 = 100 + 80 + 1$$

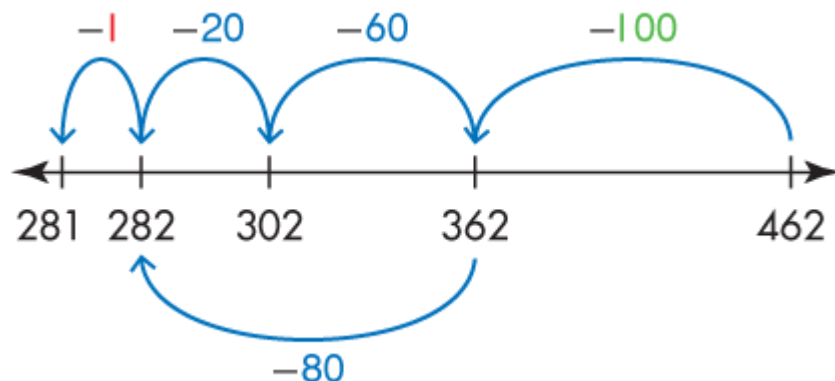
Starting at 462, count back 100 to 362.

Break apart 80 into 60 and 20 to make it easier to count back.

Then count back 60 to 302.

Count back 20 more to 282.

Finally, count back 1 to 281.



Your child can record each jump back on the number line using the partial differences method. 362, 302, and 282 are partial differences.

$$\begin{array}{r}
 462 \\
 - 100 \\
 \hline
 362 \\
 - 60 \\
 \hline
 302 \\
 - 20 \\
 \hline
 282 \\
 - 1 \\
 \hline
 281
 \end{array}$$

So, $462 - 181 = 281$.

Regrouping in Subtraction Your child will use place-value models to develop and deepen an understanding of regrouping. Here is how place-value models can help your child subtract when regrouping is required.

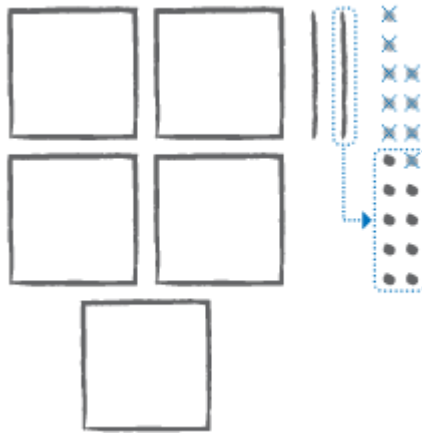
Find $528 - 349$.

Start with the ones. 9 ones are greater than 8 ones.

So first, subtract 8 ones.

$$\begin{array}{r}
 528 \\
 - 8 \\
 \hline
 520
 \end{array}$$

Then regroup 1 ten as 10 ones.



Then subtract 1 more 1 to make 9 ones.

$$\begin{array}{r} 520 \\ - \quad 1 \\ \hline 519 \end{array}$$

To continue, subtract 4 tens from the 2 tens by regrouping 1 hundred as 10 tens. Finally, subtract the hundreds. So, $528 - 349 = 179$.

Use a Standard Algorithm Your child will learn how to use an understanding of place value and a standard algorithm for subtraction. After practicing a variety of subtraction strategies, your child will be presented with problems and asked to choose whatever method is the most efficient.

When using this algorithm, regrouping is shown by marking the numbers in the problem. This algorithm is always worked from right to left.

Find $358 - 172$.

Step 1 Subtract ones.

$$\begin{array}{r} 358 \\ - 172 \\ \hline 6 \end{array}$$

8 ones – 2 ones = 6 ones

Step 2 Subtract tens.

$$\begin{array}{r} 358 \\ - 172 \\ \hline 86 \end{array}$$

Regroup: 3 hundreds + 5 tens = 2 hundreds + 15 tens
15 tens – 7 tens = 8 tens

Step 3 Subtract hundreds.

$$\begin{array}{r} 358 \\ - 172 \\ \hline 186 \end{array}$$

2 hundreds – 1 hundred = 1 hundred

So, $358 - 172 = 186$.

Subtract Across Zeros As your child learns to use different algorithms to subtract three-digit numbers, one challenge will be subtracting from a number in which there are zeros. Your child will be encouraged to estimate a difference before calculating. The estimate can then be used to check the reasonableness of the answer and to find mistakes.

Find $6,000 - 4,678$.

Estimate: $6,000 - 4,700 = 1,300$

Start regrouping from the thousands.

6 thousands = 5 thousands + 9 hundreds + 9 tens + 10 ones

$$\begin{array}{r}
 \overset{5}{\cancel{6}}, \overset{9}{\cancel{0}} \overset{9}{\cancel{0}} \overset{10}{\cancel{0}} \\
 - 4,678 \\
 \hline
 1,322
 \end{array}$$

The answer 1,322 is close to the estimate of 1,300, so the answer is reasonable.

CONNECT THE MATH

You can connect the math in this topic to everyday experiences. Be aware of situations in which you would subtract one 3-digit number from another, and enlist your child's help. You might have your child find the difference between two payments, two weights, or how many miles left to travel when you are driving a long distance. Help your child determine which method to use—mental math, estimation, partial differences, or a standard algorithm. Encourage your child to choose the method that is most reliable and accurate for the numbers in the problem.

TOPIC 8 LESSONS

Lesson 8-1	<u>Mental Math: Subtraction</u>
Lesson 8-2	<u>Estimate Differences</u>
Lesson 8-3	<u>Use Partial Differences to Subtract</u>
Lesson 8-4	<u>More Partial Differences: Regrouping</u>
Lesson 8-5	<u>Subtract Whole Numbers</u>
Lesson 8-6	<u>Subtract Greater Numbers</u>
Lesson 8-7	<u>PROCEDURAL FLUENCY PRACTICE</u>
	<u>Use a Standard Algorithm to Subtract</u>
Lesson 8-8	<u>Subtract Across Zero</u>
Lesson 8-9	

MATH THINKING AND REASONING

Complete Tasks with Mathematical Fluency

LESSON 8-1

Mental Math: Subtraction

 [MA.3.NSO.2.1](#), [MA.3.AR.1.2](#), [MTR.2.1](#), [MTR.3.1](#), [MTR.4.1](#)

For more help with this lesson, view the [Visual Learning Animation](#) or the [Another Look Video](#).

MATH HELP AT HOME

Sample Additional Practice Exercise 1

Find the difference using mental math.

$$\begin{array}{r} 232 - 117 \\ 232 + 3 \rightarrow 235 \\ -117 + 3 \rightarrow \underline{120} \\ \hline 115 \end{array}$$

Add 3 to both numbers, so that you can subtract 120 instead of 117. Subtract the adjusted numbers: $235 - 120 = 115$. So, $232 - 117 = 115$.

HOME ACTIVITY

Rounding to Tens

MATERIALS

ACTIVITY

Choose some items that are pictured in a store advertisement. Ask your child to find the difference in cost by making a simpler problem. For example, a gaming system costs \$548 (without cents) and a computer keyboard costs \$128 (without cents).

$548 + 2 = 550$ and $128 + 2 = 130$. Your child can subtract $\$550 - \$130 = \$420$ to find the difference in price because the same amount was added to both numbers.

Repeat with other items from the advertisement.

LESSON 8-2

Estimate Differences

 [MA.3.NSO.2.1](#), [MA.3.AR.1.2](#), [MTR.1.1](#), [MTR.3.1](#), [MTR.4.1](#)

For more help with this lesson, view the [Visual Learning Animation](#) or the [Another Look Video](#).

MATH HELP AT HOME

Sample Additional Practice Exercise 1

Round to the nearest hundred to estimate.

$$\begin{array}{r} 584 \rightarrow \underline{600} \\ - 347 \rightarrow \underline{300} \\ \hline 300 \end{array}$$

Round 584 to 600, and round 347 to 300. Subtract the rounded numbers:
 $600 - 300 = 300$.

HOME ACTIVITY

Bake Sale Calculations

MATERIALS

Paper, Pencil

ACTIVITY

Practice estimating quantities with your child. Tell your child that you are going to pretend to hold a bake-sale. Create four columns on your paper and label the columns "Treat," "Total," "Bake Today," and "Bake Tomorrow." Ask your child to come up with 5 items you will sell. List these items in the "treat" column, have your child decide how many of each item you will bake, and list this number in the "total" column. For example: brownies—150, lemon squares—200, crispy rice squares—250, carrot muffins—175, soft pretzels—80. Now decide together how many of each item you will bake today. Ask your child to estimate the number of each treat that will need to be baked tomorrow and record this in the last column. For example, you need 150 brownies and will bake 4 dozen, or 48, today. 48 is about 50. $150 - 50 = 100$. So, you will need to bake about 100 brownies tomorrow.

LESSON 8-3

Use Partial Differences to Subtract

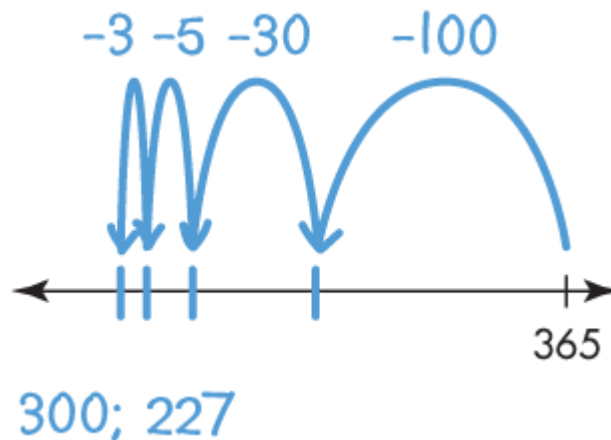
 [MA.3.NSO.2.1](#), [MA.3.AR.1.2](#), [MTR.4.1](#), [MTR.5.1](#)

For more help with this lesson, view the [Visual Learning Animation](#) or the [Another Look Video](#).

MATH HELP AT HOME

Sample Additional Practice Exercise 1

Estimate and then use partial differences to subtract. Use the number line to help.
 $365 - 138$



To estimate, round 365 to 400, round 138 to 100, and subtract the rounded numbers:
 $400 - 100 = 300$.

To subtract 138 from 365, start at 365 on the number line. Subtract 100, then 30, then 5, then 3: $365 - 100 = 265$, $265 - 30 = 235$, $235 - 5 = 230$, $230 - 3 = 227$.



HOME ACTIVITY

Book Comparisons

MATERIALS

Books, Paper, Pencil

ACTIVITY

Gather at least 5 books and ask your child to find the total number of pages in each book and arrange them from longest book (greatest number of pages) to shortest book (least number of pages). Have your child write the total number of pages in the first book and ask, "How many more pages does this have than the next longest book?" Your child should use subtraction to find the difference in total pages. For example, if the longest book has 320 pages and the next longest book has 246 pages, your child will find the difference $320 - 246$. One way to do this is to use partial differences. $320 - 200 = 120$; $120 - 40 = 80$; $80 - 6 = 74$. So, the first book is 74 pages longer than the second book. Now ask your child to compare the length of the second book to the third book, and so on.

LESSON 8-4

More Partial Differences: Regrouping

 [MA.3.NSO.2.1](#), [MA.3.AR.1.2](#), [MTR.4.1](#), [MTR.5.1](#), [MTR.7.1](#)

For more help with this lesson, view the [Visual Learning Animation](#) or the [Another Look Video](#).

MATH HELP AT HOME

Sample Additional Practice Exercise 1

Estimate the difference and then use partial differences to subtract.

$$\begin{array}{r} 914 \\ - 482 \\ \hline 432 \end{array}$$

To estimate, round 914 to 910, round 482 to 480, and subtract the rounded numbers:
 $910 - 480 = 430$.

To subtract 482 from 914, use partial differences and regroup as needed.

Subtract 2 ones: $914 - 2 = 912$.

Subtract 1 ten: $912 - 10 = 902$.

Regroup 1 hundred as 10 tens, then subtract 7 more tens: $902 - 70 = 832$.

Subtract 4 hundreds: $832 - 400 = 432$.

HOME ACTIVITY

Subtraction Art

MATERIALS

Paper, Pencil, Markers, Scissors

ACTIVITY

Ask your child to illustrate how to subtract $48 - 34$. They can draw pictures, draw place-value blocks, cut out place-value blocks to manipulate, or use another method they invent. For example, your child might draw four groups of 10 smile emojis and 8 individual emojis on the left side of the paper. Then draw three groups of 10 smile emojis and 4 individual emojis on the right side of the page. Ask them to describe or show how this illustration helps with subtraction. Now ask your child to draw a different illustration to show $48 - 39$. They might cut out place-value blocks to show each number and then model how they regroup the tens by cutting one of the tens into 10 ones before subtracting.

LESSON 8-5

Subtract Whole Numbers

 [MA.3.NSO.2.1](#), [MA.3.AR.1.2](#), [MTR.1.1](#), [MTR.2.1](#), [MTR.5.1](#)

For more help with this lesson, view the [Visual Learning Animation](#) or the [Another Look Video](#).

MATH HELP AT HOME

Sample Additional Practice Exercise 1

Subtract. Check that your answer is reasonable.

$$\begin{array}{r} 376 \\ - 234 \\ \hline 142 \end{array}$$

Subtract ones: 6 ones minus 4 ones is 2 ones.

Subtract tens: 7 tens minus 3 tens is 4 tens.

Subtract hundreds: 3 hundreds minus 2 hundreds is 1 hundred.

The result is: 1 hundred plus 4 tens plus 2 ones or 142.

To check that your answer is reasonable, estimate. Round 376 to 380, round 234 to 230, and subtract $380 - 230 = 150$. The answer 142 is close to the estimate 150, so it is reasonable.

HOME ACTIVITY

Endangered Numbers

MATERIALS

Paper, Pencil

ACTIVITY

In 1975 there were only 136 grizzly bears in Yellowstone National Park. Due to conservation efforts, in 2019 there were 728 grizzlies. Ask your child to estimate the difference in the number of bears from 1975 to 2019. For example, 136 is about 100 and 728 is about 700 so the difference is about 600 bears. Then ask your child to show you how to calculate the exact difference. Research other critically endangered species and use these numbers to practice subtracting with your child.

LESSON 8-6

Subtract Greater Numbers

 [MA.3.NSO.2.1](#), [MA.3.AR.1.2](#), [MTR.3.1](#), [MTR.5.1](#), [MTR.6.1](#)

For more help with this lesson, view the [Visual Learning Animation](#) or the [Another Look Video](#).

MATH HELP AT HOME

Sample Additional Practice Exercise 1

Subtract $729 - 438$. Estimate to check if your answer is reasonable.

$$\begin{array}{r} 6 \text{ } 12 \\ 729 \\ - 438 \\ \hline 291 \end{array}$$

Subtract ones: 9 ones minus 8 ones is 1 one.

Regroup: 7 hundreds 2 tens as 6 hundreds 12 tens.

Subtract tens: 12 tens minus 3 tens is 9 tens.

Subtract hundreds: 6 hundreds minus 4 hundreds is 2 hundreds.

The result is: 2 hundreds plus 9 tens plus 1 one or 291.

To estimate, subtract $700 - 400 = 300$. The answer 291 is close to the estimate 300, so it is reasonable.

HOME ACTIVITY

Subtraction Tic-Tac-Toe

MATERIALS

Paper, Pencil

ACTIVITY

Draw a tic-tac-toe grid. Mark the center space "Free." In each of the remaining spaces write one of the numbers: 3,494; 3,494; 716; 104; 336; 2; 2; and 618.

Fold a piece of paper into 8 sections and tear it apart to make 8 small rectangles. Write one of these expressions on each rectangle of paper: $4,876 - 1,382$; $1,234 - 518$; $489 - 385$; $385 - 49$; $4,321 - 4,319$; $81 - 79$; $3,494 - 2,876$; and $6,012 - 2,518$.

Mix up the expression cards and place them face up on the table. Ask your child to choose a card, find the difference and then make a mark on the tic-tac-toe board where that difference is written. Your child wins when they get 3 in a row, across, down, or diagonally.

LESSON 8-7

Procedural Fluency Practice: Use a Standard Algorithm to Subtract

 [MA.3.NSO.2.1](#), [MA.3.AR.1.2](#), [MTR.3.1](#), [MTR.4.1](#)

For more help with this lesson, view the [Visual Learning Animation](#) or the [Another Look Video](#).

MATH HELP AT HOME

Sample Additional Practice Exercise 1

Estimate the difference. Then use a standard algorithm to subtract. Check the answer for reasonableness.

$$\begin{array}{r} \overset{5}{\cancel{6}}\overset{13}{3}8 \\ - 264 \\ \hline 374 \end{array}$$

To estimate, subtract $600 - 300 = 300$.

Use a standard algorithm to subtract, as shown. Regroup 6 hundreds 3 tens as 5 hundreds 13 tens. Subtract ones, tens, and hundreds. The result is 374.

The answer 374 is close enough to the estimate 300, so it is reasonable.

HOME ACTIVITY

What's the Difference?

MATERIALS

Paper, Pencil

ACTIVITY

In 2021, the average 10-year-old spent about 6 hours each day in front of a screen. The average 13-year-old spent about 9 hours each day in front of a screen. Ask your child to calculate how many minutes of screen time each age group had each week (6 hours $\times$ 60 minutes $\times$ 7 days; 9 hours $\times$ 60 minutes $\times$ 7 days). Then ask them to calculate the difference in screen time between 10-year-old children and 13-year-old children. Research other facts with your child and ask them to find differences. Some possibilities are: What is the difference in the number of grade 3 and grade 4 students in your school? What is the difference in the price of 2 computers? What is the difference in the number of cats and dogs in a local shelter?

LESSON 8-8

Subtract Across Zero

 [MA.3.NSO.2.1](#), [MA.3.AR.1.2](#), [MTR.3.1](#), [MTR.4.1](#)

For more help with this lesson, view the [Visual Learning Animation](#) or the [Another Look Video](#).

MATH HELP AT HOME

Sample Additional Practice Exercise 1

Estimate the difference. Then use a standard algorithm to subtract. Check the answer for reasonableness.

$$\begin{array}{r} 916 \\ 0\cancel{10}\cancel{0}10 \\ \cancel{1,0}\cancel{7}\cancel{0} \\ - 981 \\ \hline 89 \end{array}$$

To estimate, subtract $1,100 - 1,000 = 100$.

Use a standard algorithm to subtract. Regroup as shown. The result is 89.

The answer 89 is close to the estimate 100, so it is reasonable.

HOME ACTIVITY

Less Than 3,000

MATERIALS

Number Cube, Paper, Pencil

ACTIVITY

Help your child practice subtracting across zeros by generating some numbers to subtract from 3,000. Ask your child to roll the number cube once and subtract this number from 3,000. Now ask your child to roll the number cube twice to make a 2-digit number to subtract from 3,000. Then ask your child to roll the number cube three times to make a 3-digit number to subtract from 3,000. You can extend this to a 4-digit number as long as your child rolls a 1 or a 2 for the thousands place.