

Core Focus

- Reviewing addition and subtraction strategies and using them to make estimates
- Reviewing, extending, and consolidating use of the standard addition and subtraction algorithms
- Exploring decomposition and regrouping
- Reviewing time measurement; converting between minutes and hours; introducing seconds



Addition and Subtraction

- Addition and subtraction skills learned in earlier grades are the basis for understanding why the standard algorithm works. The **standard algorithm** is the familiar paper-and-pencil procedure for adding multi-digit numbers that most adults were taught in school.
- Strategies for adding and subtracting numbers mentally are important for real-life situations. Students **decompose** (pull apart) and **compose** (put together) numbers to make them more convenient to compute mentally.

Step In Estimating with Addition

This table shows the number of vehicles that drove past the northern entrance of a school in one week.

	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Morning	195	395	354	398	405	589	217
Afternoon	235	354	409	376	437	630	289

About how many vehicles drove past the school on each school day?
Estimate the number of vehicles that drove past the school on Monday.
How did you form your estimate?

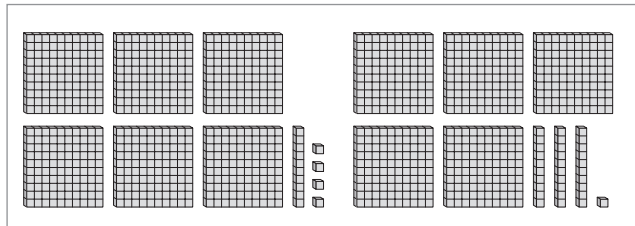
I looked for a nearby ten or hundred to round each number. I then added $400 + 350 = 750$.

Estimate the number of vehicles that drove past the school on Friday.
Is the total more or less than 1,000? How did you decide?

There were more than 500 vehicles in the morning and in the afternoon, so the total has to be more than 1,000.

In this lesson, students use estimation strategies to solve addition situations.

- In the **standard addition algorithm**, what was called “carrying” is now called **regrouping** because numbers are **regrouped** into new place values in order to combine the quantities.



This group models $614 + 531$, which is the same as 11 hundreds + 4 tens + 5 ones, which is the same as 1,145. Ten hundreds blocks are traded or regrouped for 1 thousands block. 1 thousand, 1 hundred, 4 tens, and 5 ones make a total of 1,145.

Ideas for Home

- Model for your child how you think about estimating totals when spending money at the store or driving distances in the car.
- Help your child practice estimating answers before calculating them exactly. In real life, an estimate is often all we need, so it is important to become good at estimating answers mentally.
- Practice regrouping three-digit numbers by asking your child to think of different ways to regroup the same quantity. E.g., $504 = 4$ hundreds, 9 tens, 14 ones; or 4 hundreds, 8 tens, 24 ones; or 3 hundreds, 18 tens, 24 ones; etc.
- Use place-value language when talking about the procedure: for $5,609 + 3,556$ “9 ones plus 6 ones is 5 ones and 1 ten. 1 ten plus 0 tens plus 5 tens is 6 tens, 6 hundreds plus 5 hundreds is 11 hundreds or 1 hundred and 1 thousand, and 1 thousand, plus 5 thousands, plus 3 thousands is 9 thousands.”

Glossary

- Students **decompose** (pull apart) and **compose** (put together) numbers to make them more convenient to compute mentally.

- Students round to solve addition and subtraction problems based on real-life situations. They estimate purchase prices then calculate exact solutions using composing and decomposing strategies. What used to be called “borrowing” is now **decomposition** or **regrouping**.
- Because students have already had lots of experiences **decomposing** and **composing** numbers mentally, they should find that the **standard subtraction algorithm** makes good sense.

Step 1	Step 2	Step 3																																				
Look at the digits in each place. Can you subtract each place easily? <table border="1"> <tr><td>H</td><td>T</td><td>O</td></tr> <tr><td>3</td><td>4</td><td>5</td></tr> <tr><td>-</td><td>7</td><td>8</td></tr> <tr><td></td><td></td><td></td></tr> </table>	H	T	O	3	4	5	-	7	8				You need 1 ten to help subtract the ones. Cross out 4 tens and write 3 tens. <table border="1"> <tr><td>H</td><td>T</td><td>O</td></tr> <tr><td>3</td><td>3</td><td>5</td></tr> <tr><td>-</td><td>7</td><td>8</td></tr> <tr><td></td><td></td><td></td></tr> </table>	H	T	O	3	3	5	-	7	8				Cross out the ones digit and write the new number. 345 is now written as 3 hundreds, 3 tens, and 15 ones. <table border="1"> <tr><td>H</td><td>T</td><td>O</td></tr> <tr><td>3</td><td>3</td><td>15</td></tr> <tr><td>-</td><td>7</td><td>8</td></tr> <tr><td></td><td></td><td></td></tr> </table>	H	T	O	3	3	15	-	7	8			
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You need 1 hundred to help subtract the tens. Cross out 3 hundreds and write 2 hundreds. <table border="1"> <tr><td>H</td><td>T</td><td>O</td></tr> <tr><td>2</td><td>3</td><td>15</td></tr> <tr><td>-</td><td>7</td><td>8</td></tr> <tr><td></td><td></td><td></td></tr> </table>	H	T	O	2	3	15	-	7	8				Add the 10 tens that you have just broken up to the 3 tens that you already have. You now have 13 tens. Write the number. <table border="1"> <tr><td>H</td><td>T</td><td>O</td></tr> <tr><td>2</td><td>13</td><td>15</td></tr> <tr><td>-</td><td>7</td><td>8</td></tr> <tr><td></td><td></td><td></td></tr> </table>	H	T	O	2	13	15	-	7	8				345 is now written as 2 hundreds, 13 tens, and 15 ones. Subtract the ones, tens, then hundreds to find the difference. <table border="1"> <tr><td>H</td><td>T</td><td>O</td></tr> <tr><td>2</td><td>13</td><td>15</td></tr> <tr><td>-</td><td>7</td><td>8</td></tr> <tr><td>2</td><td>6</td><td>7</td></tr> </table>	H	T	O	2	13	15	-	7	8	2	6	7
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In this lesson, the above problem is solved using the **standard subtraction algorithm**.

- Subtraction that requires **decomposing** in multiple places and subtraction where the **decomposition** involves zero can be more challenging for students.

Time

- In earlier grades, students were introduced to reading and writing times to the nearest minute before and past the hour, and to solving problems that involve elapsed time on analog and digital clocks.
- Students will extend their skills to include converting between minutes and hours, and seconds and minutes.
- Students will also work with elapsed time in hours, minutes, and seconds.

2.11 Step In **Converting between Units of Time**

This table shows the length of time that activities took in one school day.

Activity	Time
Math	1 hour
Reading	55 minutes
Writing	30 minutes
Library	30 minutes
Science	30 minutes
Art	25 minutes
Sport	45 minutes
Music	25 minutes
Social Studies	30 minutes

What is the total length of time for math and science? How could you figure out the total in minutes?

What is another way you could write the total?

1 hour + 30 minutes is the same as minutes

What are some other times in the table that total more than one hour?



In this lesson, students practice elapsed time, and convert between minutes and hours.

Ideas for Home

- Talk about time as often as possible, e.g. say, “It’s 7:55. We must leave for school at 8:30 — can you figure out how much time until then?” or “The bus will come at 2:30. See how my watch says 2:24. So how many more minutes until the bus will arrive?” Constant practice is important for helping your child learn to read, write, and make sense of time.

Glossary

- What was called “carrying” is now regrouping because numbers are regrouped into new place values in order to combine the quantities. E.g. $59 + 38 = 80 + 17 = 90 + 7 = 97$.
- The **standard algorithm** is the familiar paper-and-pencil procedure for adding and subtracting multi-digit numbers that most adults were taught in school. In the algorithm below, the 17 is regrouped into 1 ten and 7 ones; the 1 ten is regrouped into the tens column.

H	T	O
4	1	8
+	2	6
6	9	7

- Base-10 blocks are used to model the regrouping and recording process.