

**Core Focus**

- Division of three- and four-digit numbers by a one-digit number and by two-digit multiples of ten
- Using estimation and properties of numbers to divide
- Measurement conversion and problem solving with metric measure of length — meters, centimeters, millimeters, and kilometers

**Division with Whole Numbers**

- Students review the basic concept of division as fair sharing. They focus on the important strategy of **partitioning** (pulling apart) the number that is being divided into parts to be shared, piece by piece. Usually, students start by first sharing the hundreds, then the tens, and then the ones.

**8.1 Reviewing Division Strategies**

Lora bought a cell phone for \$369. She paid for it in three equal monthly payments. How could you figure out the amount she paid each month?

Rita used a sharing strategy. What do the blocks represent?

I'll call the amount that is paid each month  $P$ .  
 $P = 369 \div 3$

Mika used a different strategy. He followed these steps.

Step 1	Step 2	Step 3
He drew a rectangle to show the problem. The length of one side becomes the unknown value.	He split the rectangle into parts so that it was easier to divide by 3.	He thought: $3 \times 100 = 300$ $3 \times 20 = 60$ $3 \times 3 = 9$
3      369 P	3      300      60      9	3      300      60      9 100      +      20      +      3

In Lesson 1, students use base-10 blocks and the area model to review the steps to divide three- and four-digit numbers by a one-digit number.

- Students begin to connect their informal division strategies to a written method. Partitioning (sharing) the base-10 blocks and recording the result helps students make sense of the long-division algorithm.

**8.3 Recording Division**

Three people share the cost of renting this car. How could you figure out each person's share? Anna showed the total cost with blocks then followed these steps to figure out each share.

Shares	Step 1 Share the hundreds.	Step 2 Share the tens.	Step 3 Share the ones.
	100	20	8
	100	20	8
	100	20	8

In Lesson 3, students begin to use an array to record the steps they use to divide. Their thinking and recording lead to the division algorithm.

**Ideas for Home**

- Making sense of division relies on recognizing the related multiplication facts. To know how to divide 172 into 4 equal shares, students need to see that 172 can be thought of as 16 tens and 12 ones, both of which are easily divided by 4.

**Glossary**

- The **dividend** is the number that is split into smaller, equal parts.
- The **divisor** is either the number of parts the dividend is split into, or the number in each part.
- The **quotient** is either the number of parts or the number in each part.

**12 ÷ 3 = 4**

dividend divisor quotient

Numbers in equations are arranged in different positions when using division brackets.

$$64 \div 2 = 32 \quad 2 \overline{) 6 \quad 4}$$

- Students learn about the **division symbol**, which is used with the standard algorithm. Students relate the numbers in the equation to those in the bracket form.

**8.5 Introducing the Standard Division Algorithm**

Three friends equally share \$78.

Jacob used blocks and wrote this to figure out each share.  
How much is each share?  
What regrouping did Jacob have to do? How do you know?

78 + 3
7 tens + 3 = 2 tens
and 1 ten left over
18 ones + 3 = 6 ones

Tia tried using the division bracket but did not know how to show the regrouping.

Emily showed her the standard division algorithm to help.

Step 1	T   O 2   3 ) 7   8
Divide	There are 7 tens to share. There are 3 shares. There are 2 tens in each share because $3 \times 2$ is 6.

Step 2	T   O 2   3 ) 7   8 - 6 --- 1
Multiply then subtract.	There are 7 tens to share. There are 6 tens shared. There is 1 ten left over because $7 - 6$ is 1.

Step 3	T   O 2   3 ) 7   8 - 6 --- 1   8
Bring down the next digit.	There is 1 ten left to share. There are 8 ones to share. That makes 18 ones to share.

	T   O 2   6 3 ) 7   8 - 6 --- 1   8 - 1   8 --- 0
Emily completed the standard algorithm by repeating the first two steps with 18 ones to share.	

In Lesson 5, students use the standard algorithm for division to divide two-digit dividends by one-digit divisors.

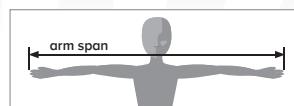
### Measurement: Metric Length

- Students review and extend work they did in Grade 4 with metric measures of length — meters (m), centimeters (cm), millimeters (mm), and kilometers (km).
- Students learn that to convert from a long to a short unit (e.g. meters to centimeters), they multiple by the appropriate power of 10 (5 meters is 500 centimeters because each meter is 100 centimeters).
- To convert from a short to a long unit (e.g. meters to kilometers), students divide by the appropriate power of 10 (1500 meters is 1.5 kilometers because each kilometer is 1,000 meters).

**8.8 Converting Between Centimeters and Meters**

Choose the number below that is likely to match an adult's arm span.

0.85 m      1.65 m



Why did you choose that number?  
How would you describe the arm span in centimeters?  
What is another way you could describe and write that length?

You could write it as a mixed number.

Complete this diagram to make a true statement.

1.65 m is the same length as \_\_\_\_\_ cm is the same length as 1  $\frac{_____}{100}$  m

In Lesson 8, students convert meters to centimeters and centimeters to meters.

### Ideas for Home

- Select any number from 25 to 100, and any single digit from 2 to 9 to create division problems (e.g. “39 shared by 4”). Ask your child to estimate the quotient using multiplication — which basic fact will get as close as possible without going over? In this case,  $4 \times 9 = 36$  is the closest fact, so 39 shared by 4 will be about 9 with some left over.
- At track events and road races, we hear of the 100 meter dash or a 5 kilometer walk. Look for other examples of metric measurement in your daily life.
- Take turns to estimate small lengths (length of a shoe) or longer distances (from one side of a room to the other) in metric units. Check your estimates using a metric ruler or meter stick.

### Glossary

- 1 kilometer = 1,000 meters  
1 meter = 100 centimeters  
1 centimeter = 10 millimeters  
1 kilometer = 0.62 miles  
1 mile = 1.6 kilometers