

Dividing Whole Numbers

Unit 4 Overview: 8 lessons

Students divide multiples of 10, 100 and 1,000 by multiples of 10 with a basic fact ($4,200 \div 70$ is $420 \text{ tens} \div 7 \text{ tens}$) and estimate quotients with compatible numbers. Then they divide 3-, 4- and 5-digit numbers by 2-digit numbers with area models and partial quotients, then with the standard algorithm, rounding the divisor to estimate each digit and fixing one that is too big or too small, and writing a 0 in the quotient where a place has no groups. They decide what a remainder means in a story and solve division stories of one and more steps. Ask “about how many groups of the divisor fit?” every day: every method in the unit takes away equal groups, place by place. Lesson 4.7 (a remainder as a fraction or a decimal) is for the states that teach it in 5th grade.

THE UNIT, DAY BY DAY

Day 1	Pre-Check	What students already know, before the first lesson.
Day 2	4.1 Divide by multiples of 10	I can divide by multiples of ten with a fact I know.
Day 3	4.2 Estimate quotients	I can estimate a quotient with compatible numbers.
Day 4	4.3 Area models and partial quotients	I can use partial quotients.
Day 5	4.4 The standard algorithm	I can do long division.
Day 6	4.5 Larger dividends and zeros in the quotient	I can write a 0 in the quotient when I need one.
Day 7	4.6 What the remainder means	I can decide what a remainder means in a story.
Day 8	4.7 Remainders as fractions and decimals ★	I can write a remainder as a fraction or a decimal.
Day 9	4.8 Division stories	I can solve division stories.
Day 10	Unit Review	The review, to go over together.
Day 11	Unit Test	Form A; Form B (other numbers) is for a retest.

★ Taught in 5th grade in some states. Skip these lessons if yours teaches them in another grade; animalmath.com/standards shows your state's list.

GET READY FOR THE UNIT

- Grid paper (1 centimeter) for the long division bracket and for area models
- Whiteboards and dry erase markers
- Multiplication charts for students who need the facts at hand
- Play money (bills and coins) for sharing dollars and cents
- Chart paper for anchor charts: divide with a fact, compatible numbers, partial quotients, estimate and fix a digit

HOW EACH LESSON GOES

- 1. Warm up** (5 min)
 - 2. Teach** (10 min)
 - 3. Try it together** (10 min)
 - 4. Practice** (15 min)
 - 5. Exit ticket** (5 min): a quick check on the lesson.
- Each lesson page ends with the Animal Math sheets, makers, tools and quizzes for it. “Sheet 3” is the third worksheet of a pack; a color pack prints each sheet again in black and white.

CHECKING AS YOU GO

PRINTABLE	Pre-Check: Day 1, with a key	EXIT TICKET	Exit Tickets: one a lesson, two to a page
PRINTABLE	Unit Review: the day before the test	PRINTABLE	Unit Test: Forms A and B, with keys



Dividing Whole Numbers

Lesson 4.1: Divide by multiples of 10

GOAL Students divide multiples of 10, 100 and 1,000 by multiples of 10 with a basic fact and the pattern of zeros ($4,200 \div 70$ is 420 tens $\div$ 7 tens, so 60), and check each quotient by multiplying.

About 45 minutes

I can divide by multiples of ten with a fact I know.

THE LESSON

- 1 Warm up** (5 min) Quick facts: $42 \div 7$, $48 \div 8$ and $27 \div 9$. Then 7×60 and 70×60 .
- 2 Teach** (10 min) Write the pattern $42 \div 7 = 6$, $420 \div 70 = 6$, $4,200 \div 70 = 60$, $42,000 \div 70 = 600$. In $4,200 \div 70$ both numbers are tens: cross off one zero from each and divide $420 \div 7 = 60$. Check: $70 \times 60 = 4,200$. Then $3,000 \div 60$: the fact $30 \div 6 = 5$ uses one zero of 3,000, so the quotient is 50.
Say: "I cross off the same number of zeros from both numbers, then use a fact. I check by multiplying."
- 3 Try it together** (10 min) Pairs write a pattern from one fact: $56 \div 8$, $560 \div 80$ and $5,600 \div 80$, and check each by multiplying. Then they find the missing numbers in $\square \div 40 = 70$ and $2,700 \div \square = 90$.
- 4 Practice** (15 min) Students do problems 1 to 7 on sheet 1 of Dividing by 2-Digit Numbers, then a fact drill sheet. For review: sheet 3 of Multiplying and Dividing by Powers of Ten (dividing by 10, 100 and 1,000). For a step back, the fact drill setting Multiples of 10, 100 and 1,000 keeps divisors to 1 digit.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 4.1** and circle a face beside the "I can" line. On question 1, look for 40, 9 and 80; 400 or 4 for $3,600 \div 90$ means the zeros were not crossed off in pairs. On question 2, look for 5,400 and 70; 540 or 7 means a zero was lost: check by multiplying.

Ready for more? Write three divisions by multiples of 10 that have a quotient of 80.

GET READY

- A place value chart for each student
- Multiplication charts
- Whiteboards and markers

WORDS TO USE

multiple of 10: a number ending in 0, like 70

quotient: the answer to a division

pattern of zeros: how $42 \div 7$ grows to $4,200 \div 70$

ASK

- How many tens is 4,200?
- Which fact helps with $3,000 \div 60$?
- How can you check by multiplying?

WATCH FOR

Writes 6 for $4,200 \div 70$. Cross off one zero from each: $420 \div 7 = 60$. Check: 70×6 is only 420.

Writes 5 for $3,000 \div 60$. The fact is $30 \div 6$: it uses one of the zeros. Check: $60 \times 50 = 3,000$.

Crosses off zeros in the dividend only. Cross off as many zeros from each number.

Need help? Read 4,200 as 420 tens and share 420 tens into groups of 7 tens.

ON ANIMAL MATH

PRINTABLE

Dividing by 2-Digit Numbers: sheet 1, problems 1 to 7

PRINTABLE

Multiplying and Dividing by Powers of Ten: sheet 3, for review

MAKER

Division Fact Drills: Times Tables: Both Numbers Multiples of 10 (Multiples of 10, 100 and 1,000 for a step back)

QUIZ

Long Division Quiz: the Divide with a Fact level

EXIT TICKET

5th Grade Dividing Whole Numbers Exit Tickets: Exit Ticket 4.1

Dividing Whole Numbers

Lesson 4.2: Estimate quotients

GOAL Students estimate a quotient with compatible numbers: they round the divisor to the nearest ten, change the dividend to a nearby number it divides with a basic fact ($2,738 \div 68$ is about $2,800 \div 70 = 40$), and use the estimate to judge an answer.

About 45 minutes

I can estimate a quotient with compatible numbers.

THE LESSON

- 1 Warm up** (5 min) Round each divisor to the nearest ten: 68, 43, 27 and 85. Then name the multiple of 700 nearest to 2,738.
- 2 Teach** (10 min) Estimate $2,738 \div 68$. Round 68 to 70. 27 hundreds is close to 28 hundreds, and $28 \div 7 = 4$, so $2,800 \div 70 = 40$. Is $2,738 \div 68 = 402$ reasonable? No: the estimate is 40, so 402 has a digit too many. Then $4,850 \div 69$: round 69 to 70, and 48 hundreds is close to 49 hundreds, so $4,900 \div 70 = 70$.
Say: "I round the divisor to the nearest ten. Then I find a number near the dividend that it divides with a fact I know."
- 3 Try it together** (10 min) Show answer cards; pairs estimate and hold up yes or no: $1,642 \div 82 = 20 \text{ R } 2$, $2,365 \div 39 = 6 \text{ R } 25$ and $2,912 \div 52 = 56$. Fix the wrong one together: $2,400 \div 40 = 60$, so it is $60 \text{ R } 25$.
- 4 Practice** (15 min) Students estimate with compatible numbers in problems 8 to 11 on sheet 1 of Dividing by 2-Digit Numbers, then fill in only the Estimate lines on sheet 5 of Long Division with Remainders (its key shows one way; others are right too). They solve those stories in lesson 4.8.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 4.2** and circle a face beside the "I can" line. On question 1, look for an estimate like $4,000 \div 40 = 100$ and No: 950 has a digit too many. On question 2, look for an estimate like $3,600 \div 30 = 120$; $3,500 \div 30$ does not use a fact, and rounding 29 to 20 gives an estimate far off.

Need help? List the multiples of the rounded divisor that end in 00, then circle the one nearest the dividend.

Ready for more? Write a division whose estimate is 50 but whose answer is not reasonable, and swap with a partner.

ON ANIMAL MATH

PRINTABLE **Dividing by 2-Digit Numbers:** sheet 1, problems 8 to 11

PRINTABLE **Long Division with Remainders:** sheet 5, the Estimate lines only

QUIZ **Long Division Quiz:** the Estimate with 2-Digit Divisors level

EXIT TICKET **5th Grade Dividing Whole Numbers Exit Tickets:** Exit Ticket 4.2

GET READY

- Answer cards with right and wrong quotients
- Multiplication charts
- Whiteboards and markers

WORDS TO USE

compatible numbers: numbers close to the real ones that divide easily with a fact

estimate: a close answer from easier numbers

reasonable: close to the estimate, so it makes sense

ASK

- What did you round the divisor to?
- Which number near the dividend does it divide with a fact?
- How many digits should the quotient have?

WATCH FOR

Rounds the dividend to the nearest thousand: **$3,000 \div 70$.** Pick a number near the dividend that the fact divides: 28 hundreds.

Calls 402 reasonable. Compare with the estimate: 40 has two digits, 402 has three.

Rounds 68 down to 60. Round to the nearest ten: 68 is closer to 70.

Dividing Whole Numbers

Lesson 4.3: Area models and partial quotients

GOAL Students divide 3- and 4-digit numbers by a 2-digit number with an area model (the divisor is one side; the parts of the other side are easy amounts like 100, 40 and 2) and with partial quotients, writing what is left as the remainder.

About 45 minutes

I can use partial quotients.

THE LESSON

- 1 Warm up** (5 min) List easy multiples of 24: 24×10 , 24×20 , 24×50 and 24×100 .
- 2 Teach** (10 min) Draw an area model for $2,698 \div 19$: side 19, area 2,698. $19 \times 100 = 1,900$ leaves 798; $19 \times 40 = 760$ leaves 38; $19 \times 2 = 38$. The other side is $100 + 40 + 2 = 142$. Then $3,917 \div 24$ with partial quotients: take away 100, 50, 10 and 3 groups of 24 (2,400, 1,200, 240 and 72), leaving 5: 163 R 5.
Say: "How many groups of 24 can I take away easily? I subtract, write the partial quotient, and stop when less than 24 is left."
- 3 Try it together** (10 min) Pairs draw the area model for $1,035 \div 15$ (60 and 9, so 69). Then partners solve $2,846 \div 21$ two ways, taking away 100, 30 and 5 groups or 100, 20, 10 and 5: both get 135 R 11.
- 4 Practice** (15 min) Students find the sides of the area models and divide with partial quotients on sheet 2 of Dividing by 2-Digit Numbers, then problems 1 and 2 on sheet 4 of Long Division with Remainders. Early finishers solve a maker sheet with partial quotients.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 4.3** and circle a face beside the "I can" line. On question 1, look for the sides 40 and 6 and the quotient 46; 720 or 108 as a side means areas were taken for sides. On question 2, look for 38 R 22 (30 and 8 is one way); a remainder of 23 or more means another group fits.

Need help? Write a list of easy multiples of the divisor (10, 20, 50 and 100 groups) before starting.

Ready for more? Solve $5,000 \div 24$ in as few steps as you can.

GET READY

- Grid paper
- A list of easy multiples of the divisor
- Whiteboards and markers

WORDS TO USE

area model: the divisor is one side, the dividend the area

partial quotient: one part of the quotient, like 100 or 50

remainder: what is left when no more groups fit

ASK

- Which easy multiple can you take away first?
- How do you know when to stop?
- How do the sides of the area model make the quotient?

WATCH FOR

Adds the amounts taken away to find the quotient. Add the partial quotients, not the amounts subtracted.

Stops with 24 or more left. Then another group fits: take it away.

Writes the areas as the quotient. The quotient is the side: $100 + 40 + 2$, not the areas.

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PRINTABLE

Dividing by 2-Digit Numbers: sheet 2

PRINTABLE

Long Division with Remainders: sheet 4, problems 1 and 2

MAKER

Long Division: Divisor: 2 Digits, Range: Within 10,000, No Remainders off (Advanced Options)

QUIZ

Long Division Quiz: the Divide by 2 Digits level

EXIT TICKET

5th Grade Dividing Whole Numbers Exit Tickets: Exit Ticket 4.3

Dividing Whole Numbers

Lesson 4.4: The standard algorithm

GOAL Students divide by a 2-digit number with the standard algorithm: they round the divisor to estimate each quotient digit, multiply to check it, and fix a digit that is too big (the product is more than the number) or too small (what is left is not less than the divisor).

About 45 minutes

I can do long division.

THE LESSON

- 1 Warm up** (5 min) Round 17, 34, 46 and 71 to the nearest ten. Then 27×4 and 27×5 .
- 2 Teach** (10 min) Divide $1,584 \div 24$. Round 24 to 20: $158 \div 20$ is about 7, but $24 \times 7 = 168$, more than 158, so 7 is too big. Try 6: $24 \times 6 = 144$, and 14 is left. Bring down 4: $144 \div 20$ is about 7 again, too big, and 6 fits exactly. So 66. A digit can be too small too: for $125 \div 17$, try 6 ($120 \div 20$); $17 \times 6 = 102$ and 23 is left, more than 17, so the digit is 7.
Say: "I round the divisor to estimate the digit, multiply to check it, then fix it: too big, try one less; too much left, try one more."
- 3 Try it together** (10 min) Solve $1,967 \div 21$ together, a step a student (93 R 14). Then partners do $2,310 \div 18$, where the last digit tried from $150 \div 20$ leaves 24, so it is too small (128 R 6).
- 4 Practice** (15 min) Students judge and fix each tried digit, then divide, on sheet 3 of Dividing by 2-Digit Numbers, then problems 3 and 4 on sheet 4 of Long Division with Remainders.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 4.4** and circle a face beside the "I can" line. On question 1, look for 88 R 8; a remainder of 21 or more means a quotient digit was too small. On question 2, look for Too big and the digit 4: $42 \times 5 = 210$ is more than 200.

Need help? Write the first nine multiples of the divisor in a list beside the problem and pick from it.

Ready for more? Find a division by 19 where a tried digit is too small. Why does rounding 19 up to 20 do that?

GET READY

- Grid paper for the bracket
- A chart: estimate, multiply, subtract, compare, bring down
- Whiteboards and markers

WORDS TO USE

estimate a digit: round the divisor and use a fact

too big: the product is more than the number

too small: what is left is the divisor or more

ASK

- What did you round the divisor to?
- How do you know the digit is too big?
- Is what is left less than the divisor?

WATCH FOR

Subtracts a product that is too big. If the product is more than the number, the digit is too big: try one less.

Leaves more than the divisor and moves on. What is left must be less than the divisor; if not, try one more.

Rounds 18 to 10. Round to the nearest ten: 18 is closer to 20.

ON ANIMAL MATH

PRINTABLE

Dividing by 2-Digit Numbers: sheet 3

PRINTABLE

Long Division with Remainders: sheet 4, problems 3 and 4

MAKER

Long Division: Divisor: 2 Digits, Range: Within 1,000 or Within 10,000

QUIZ

Long Division Quiz: the Divide by 2 Digits level

EXIT TICKET

5th Grade Dividing Whole Numbers Exit Tickets: Exit Ticket 4.4

Dividing Whole Numbers

Lesson 4.5: Larger dividends and zeros in the quotient

GOAL Students divide 4- and 5-digit numbers by a 2-digit number and write a 0 in the quotient whenever the divisor does not fit into the number brought down, using an estimate to check how many digits the quotient has.

About 45 minutes

I can write a 0 in the quotient when I need one.

THE LESSON

- 1 Warm up** (5 min) How many digits will each quotient have? $6,321 \div 21$ and $16,368 \div 16$. Estimate each first.
- 2 Teach** (10 min) Divide $6,321 \div 21$. 63 hundreds $\div 21 = 3$ hundreds, nothing left. Bring down 2: 21 does not fit in 2, so write 0 in the tens. Bring down 1: $21 \div 21 = 1$. The quotient is 301, not 31; the estimate, $6,000 \div 20 = 300$, agrees. Then $16,368 \div 16$: 16 thousands $\div 16 = 1$, then 3 hundreds is too few, so 0 in the hundreds, then $36 \div 16 = 2$ with 4 left, and $48 \div 16 = 3$: 1,023.
Say: "If the divisor does not fit, I write 0 in that place and bring down the next digit."
- 3 Try it together** (10 min) Pairs estimate, then solve $7,616 \div 19$ (400 R 16: two zeros at the end) and $12,408 \div 12$ (1,034), and check each by multiplying.
- 4 Practice** (15 min) Students divide in problems 1 and 2 on sheet 4 of Dividing by 2-Digit Numbers (zeros in the quotient, then a five-digit dividend), then a maker sheet, circling every quotient with a 0 in it.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 4.5** and circle a face beside the "I can" line. On question 1, look for 60 R 17; 6 R 17 means the 0 in the ones was left out, and the estimate ($1,400 \div 20 = 70$) shows two digits. On question 2, look for 605 circled; 65 leaves out the 0 in the tens, and 650 puts it in the wrong place.

Need help? Write the place names over the dividend and fill in a digit for every place of the quotient.

Ready for more? Find a 5-digit number that gives a quotient with two zeros when you divide it by 25.

GET READY

- Grid paper for the bracket
- The estimate and fix chart from lesson 4.4
- Whiteboards and markers

WORDS TO USE

placeholder zero: a 0 in the quotient when the divisor does not fit

place value: what a digit is worth by where it is

estimate: a close answer that tells how many digits to expect

ASK

- How many digits should the quotient have?
- What do you write when the divisor does not fit?
- Does your answer match your estimate?

WATCH FOR

Writes 31 for $6,321 \div 21$. Estimate: $6,000 \div 20$ is 300, so the answer has three digits.

Stops when the last digit brought down is too small. Write a 0 in that place: 400 R 16, not 4 R 16.

Writes a 0 at the start of the quotient. Start over the first place the divisor fits.

ON ANIMAL MATH

PRINTABLE

Dividing by 2-Digit Numbers: sheet 4, problems 1 and 2

MAKER

Long Division: Divisor: 2 Digits, Range: Within 10,000 or 10,000 to 100,000

QUIZ

Long Division Quiz: the Divide by 2 Digits level

EXIT TICKET

5th Grade Dividing Whole Numbers Exit Tickets: Exit Ticket 4.5

Dividing Whole Numbers

Lesson 4.6: What the remainder means

GOAL Students solve division stories and decide what the remainder means: one more group is needed (round up), only full groups count (drop it), or the remainder is the answer, then answer with a whole number and the unit.

About 45 minutes

I can decide what a remainder means in a story.

THE LESSON

- 1 Warm up** (5 min) Act it out: 26 students sit 8 to a table ($26 \div 8 = 3 \text{ R } 2$). How many tables do we need? How many tables are full?
- 2 Teach** (10 min) Write $645 \div 18 = 35 \text{ R } 15$ and ask three questions. 645 bottles go in cases of 18: how many full cases? 35 (drop it). How many cases hold them all? 36 (round up). How many bottles are left over? 15 (the remainder is the answer).
Say: "The division is the same. The question tells me what to do with the remainder."
- 3 Try it together** (10 min) Pairs sort story cards by what the remainder means, then solve one of each with $410 \div 16 = 25 \text{ R } 10$: 410 hikers, 16 to a van (26 vans); 410 photos, 16 to a full page (25 pages); 410 cookies in bags of 16 (10 left over).
- 4 Practice** (15 min) Students do the example and stories 1 to 3 on sheet 5 of Dividing by 2-Digit Numbers (story 4, sharing, is for lesson 4.7). For a step back, sheet 5 of Division with Remainders asks two questions of one division by a 1-digit number.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 4.6** and circle a face beside the "I can" line. On question 1, look for 6 R 6 and 7 buses; 6 buses leaves 6 students behind. On question 2, look for 16 R 8 and 16 cartons; 17 means the student rounded up, but the 17th carton would not be full.

Need help? Act a small story out with counters (20 counters in groups of 6) before deciding what the remainder means.

Ready for more? Write a story for $500 \div 24$ for each meaning of the remainder.

GET READY

- Story cards
- Counters
- Whiteboards and markers

WORDS TO USE

round up: add one more group so nothing is left out

drop it: count only the full groups

the remainder is the answer: the question asks how many are left

ASK

- What does the question ask for?
- Does a group that is not full count here?
- Would your answer work in real life?

WATCH FOR

Writes 35 R 15 as the answer to a story. Read the question again and answer with a whole number and the unit.

Always rounds up. Ask: is a case that is not full any use here?

Answers with the quotient when the question asks how many are left. Underline the question: left over means the remainder.

ON ANIMAL MATH

PRINTABLE

Dividing by 2-Digit Numbers: sheet 5, the example and stories 1 to 3

PRINTABLE

Division with Remainders: sheet 5 (4th grade), a step back

QUIZ

Long Division Quiz: the What the Remainder Means level

EXIT TICKET

5th Grade Dividing Whole Numbers Exit Tickets: Exit Ticket 4.6

Dividing Whole Numbers

Lesson 4.7: Remainders as fractions and decimals

GOAL Students write a remainder as a fraction of the divisor or as a decimal when a story shares something that can be split, and choose the form that fits: R for things that cannot be split, a mixed number for things cut into parts, dollars and cents for money.

About 45 minutes

★ Taught in 5th grade in some states

I can write a remainder as a fraction or a decimal.

THE LESSON

- 1 Warm up** (5 min) Draw 7 waffles shared equally by 4 friends ($7 \div 4$). How much waffle does each friend get?
- 2 Teach** (10 min) Divide $863 \div 25 = 34 \text{ R } 13$. Over the divisor, the remainder is $13/25$, so $34 \frac{13}{25}$. As a decimal, $13/25 = 52/100 = 0.52$, so 34.52 . Which fits? If \$863 is shared by 25 people, each gets \$34.52. If 863 chairs go in rows of 25, there are 34 full rows and 13 chairs left (R). Then 50 granola bars shared by 16 students: $3 \text{ R } 2$, so $3 \frac{2}{16}$, or $3 \frac{1}{8}$ bars each.
Say: "Can the thing be split? Money splits into cents and food into parts. If not, I write the remainder after R."
- 3 Try it together** (10 min) Pairs solve three stories and pick the form: 14 friends share 35 muffins ($2 \frac{1}{2}$ muffins each); 16 scouts share \$92 (\$5.75 each); $214 \div 15 = 14 \text{ R } 4$ for 214 photos, 15 to a page (14 full pages, 4 photos left).
- 4 Practice** (15 min) Students write each remainder after R, as a fraction and as a decimal, in problems 3 to 5 on sheet 4 of Dividing by 2-Digit Numbers, then solve story 4 on its sheet 5. For a step back, sheet 3 of Long Division with Remainders writes remainders as fractions with 1-digit divisors.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 4.7** and circle a face beside the "I can" line. On question 1, look for $1 \frac{1}{3}$ melons (or $1 \frac{5}{15}$); $1 \text{ R } 5$ does not fit, because melons can be cut. On question 2, look for \$6.25; \$6.03 or $6 \text{ R } 3$ means the remainder was not turned into cents.

Need help? Use play money: share the dollars, trade each dollar left for 100 pennies, and keep sharing.

Ready for more? Find a division by 25 whose remainder is 0.36 as a decimal. Write a money story for it.

GET READY

- Play money: bills and pennies
- Paper strips to cut
- Whiteboards and markers

WORDS TO USE

remainder as a fraction: the remainder over the divisor: 4 left when dividing by 16 is $\frac{4}{16}$, or $\frac{1}{4}$

mixed number: a whole number and a fraction, like $3 \frac{1}{8}$

dollars and cents: money written with a decimal point, like \$5.75

ASK

- Can the thing in the story be split?
- What is the remainder over the divisor in simplest form?
- How many cents is the remainder worth?

WATCH FOR

Writes the fraction over the dividend. It is the remainder over the divisor: 13 out of 25, so $\frac{13}{25}$.

Writes \$34.13 for $34 \text{ R } 13$. 13 left out of 25 is $\frac{13}{25}$ of a dollar: 52 cents.

Splits things that cannot be split. Ask: can you have part of a chair? Then write R.

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PRINTABLE

Dividing by 2-Digit Numbers: sheet 4, problems 3 to 5, and sheet 5, story 4

PRINTABLE

Long Division with Remainders: sheet 3 (1-digit divisors), a step back

EXIT TICKET

5th Grade Dividing Whole Numbers Exit Tickets: Exit Ticket 4.7

Dividing Whole Numbers

Lesson 4.8: Division stories

GOAL Students solve one-step and multi-step division stories with 2-digit divisors: they decide what to divide, write an equation with a letter, estimate, divide, check by multiplying and answer with the unit.

About 45 minutes

I can solve division stories.

THE LESSON

- 1 Warm up** (5 min) Multiply or divide? Pairs hold up a sign for each: 18 rows of 25 chairs; 375 chairs in rows of 25; 375 chairs and 40 more.
- 2 Teach** (10 min) Read: A farm packs 1,386 eggs in cartons of 18. How many cartons? $1,386 \div 18 = c$, so 77 cartons (estimate $1,400 \div 20 = 70$; check $18 \times 77 = 1,386$). Then two steps: A teacher buys 12 boxes of 48 markers and shares them equally among 18 tables. Step 1: $12 \times 48 = 576$ markers. Step 2: $576 \div 18 = m$, so 32 markers a table.
Say: "What is being shared or grouped? I write an equation with a letter, estimate, divide, then check by multiplying."
- 3 Try it together** (10 min) Pairs solve one story of each kind with an equation: $1,105 \div 17$ for 1,105 people in groups of 17 (65 groups), and 9 packs of 120 stickers shared equally by 24 students ($1,080 \div 24 = 45$ stickers each).
- 4 Practice** (15 min) Students estimate, divide and answer the stories on sheet 5 of Long Division with Remainders, circling what they did with each remainder, then solve the stories of three steps or more on sheet 5 of Multi-Step Word Problems.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 4.8** and circle a face beside the "I can" line. On question 1, look for $912 \div 24 = 38$ boxes. On question 2, look for $432 + 304 = 736$ and $736 \div 16 = 46$ boxes ($27 + 19$ is right too); 27 means only the apples were packed.

Need help? Draw a bar for the total cut into equal parts, and label what one part means.

Ready for more? Write a two-step story whose second step is $1,200 \div 25$, and trade with a partner.

GET READY

- Story cards
- Grid paper for the bracket
- Whiteboards and markers

WORDS TO USE

equation: a number sentence with an equal sign

letter: stands for the number we do not know yet

check: multiply the quotient by the divisor, then add the remainder

ASK

- What is being shared or put in groups?
- What does your letter stand for?
- How can you check by multiplying?

WATCH FOR

Divides the wrong way round. The total is what is shared: it goes inside the bracket.

Stops after the first step. Read the question again: what does it ask for?

Forgets what the remainder means. Ask what the question wants: full groups, all of them, or the leftovers.

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PRINTABLE

Long Division with Remainders: sheet 5

PRINTABLE

Multi-Step Word Problems: sheet 5

QUIZ

Word Problems Quiz: the Multi-Digit $\times$ and $\div$ level

EXIT TICKET

5th Grade Dividing Whole Numbers Exit Tickets: Exit Ticket 4.8