

Word Problems and Tens

Unit 7 Overview: 10 lessons

Students multiply a one-digit number by a multiple of 10 by thinking in tens (2×70 is 2×7 tens, 14 tens, 140) and find missing factors with tens. Then they solve story problems with all four operations: equal groups and arrays with the unknown in any place, measurement stories in centimeters, liters and kilograms, two-step stories with a step for each operation, and equations with a letter for the unknown. They round to the nearest hundred to decide whether an answer is reasonable. In some states the unit also multiplies a 2-digit number by a 1-digit number, solves times as many stories, and decides whether equations with $\times$ and $\div$ are true.

THE UNIT, DAY BY DAY

Day 1	Pre-Check	What students already know, before the first lesson.
Day 2	7.1 Multiply by multiples of 10	I can multiply a number by a multiple of 10.
Day 3	7.2 Missing factors and stories with tens	I can find missing factors and solve stories with tens.
Day 4	7.3 Equal groups and array stories	I can write an equation for an equal groups story.
Day 5	7.4 Measurement stories	I can multiply or divide to solve measurement stories.
Day 6	7.5 Two-step stories	I can solve a story in two steps.
Day 7	7.6 A letter for the unknown	I can write an equation with a letter for the unknown.
Day 8	7.7 Is it reasonable?	I can estimate to check if an answer makes sense.
Day 9	7.8 2-digit times 1-digit ★	I can multiply a 2-digit number by a 1-digit number.
Day 10	7.9 Times as many ★	I can solve times as many stories.
Day 11	7.10 True or false with $\times$ and $\div$ ★	I can tell if an equation with $\times$ or $\div$ is true.
Day 12	Unit Review	The review, to go over together.
Day 13	Unit Test	Form A; Form B (other numbers) is for a retest.

★ Taught in 3rd 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

- Base-ten blocks for each pair: rods and unit cubes
- Counters and paper plates or cups for equal groups
- Whiteboards and dry erase markers for equations and bar models
- A class chart of story types: equal groups, arrays, measurement, two steps
- A multiplication chart for each student

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, four to a page
PRINTABLE	Unit Review: the day before the test	PRINTABLE	Unit Test: Forms A and B, with keys



Word Problems and Tens

Lesson 7.1: Multiply by multiples of 10

GOAL Students multiply a one-digit number by a multiple of 10 by thinking in tens: 3×40 is 3 groups of 4 tens, 12 tens, 120. They see why 5×20 ends in two zeros.

About 45 minutes

I can multiply a number by a multiple of 10.

THE LESSON

- 1 Warm up** (5 min) Quick facts with a partner: 3×4 , 7×6 , 2×8 , 5×6 . Then count by tens to 200 and say how many tens each number is: 120 is 12 tens.
- 2 Teach** (10 min) Show 3 groups of 4 rods. Count the rods: 12 tens, so 120. Write $3 \times 40 = 3 \times 4 \text{ tens} = 12 \text{ tens} = 120$. Then 9×70 : $9 \times 7 = 63$, so 63 tens, 630. Then 5×20 : $5 \times 2 = 10$, so 10 tens, 100. The fact already ends in 0, so the answer has two zeros.
Say: "I multiply the fact first, then make it tens. 9×7 is 63, so 9×70 is 63 tens: 630."
- 3 Try it together** (10 min) Partners build 2×80 and 4×90 with rods, then write each the tens way. Then the class solves 9×60 , 60×9 and 2×50 without blocks and talks about the extra zero in 2×50 .
- 4 Practice** (15 min) Students do sheet 1 of Multiplying by Multiples of 10 (equal groups of rods) and sheet 2 (use the fact you know), then sheet 3 (the drill). Early finishers try the hundreds column on sheet 2.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 7.1** and circle a face beside the "I can" line. On question 1, look for 180, 560 and 200; 20 for 5×40 means the student dropped a zero from $5 \times 4 = 20$. On question 2, look for 4 tens, 24 tens and 240.

Need help? Build every problem with rods and say it in tens before writing the number.

Ready for more? Use the fact to go on: 3×8 , 3×80 , 3×800 . What is the pattern?

GET READY

- Base-ten rods for each pair
- Whiteboards and markers
- A multiplication chart

WORDS TO USE

multiple of 10: a number you say counting by tens, like 20, 50 or 90

tens: groups of ten; 12 tens is 120

factor: a number you multiply

ASK

- What fact do you know that helps?
- How many tens is that? What number is that?
- Why does 5×20 have two zeros?

WATCH FOR

Writes 10 for 5×20 , or 1,000 for 5×20 . Say it in tens: 5×2 tens is 10 tens. Count 10 rods by tens.

Adds instead: $3 \times 40 = 43$. Build 3 groups of 4 rods and count the tens.

Thinks 60×9 is different from 9×60 . Turn the rods around: 9 groups of 6 tens or 6 tens 9 times.

ON ANIMAL MATH

PRINTABLE

Multiplying by Multiples of 10: sheets 1-3

TOOL

Base Ten Blocks: build equal groups of rods

EXIT TICKET

3rd Grade Word Problems Exit Tickets: Exit Ticket 7.1

Word Problems and Tens

Lesson 7.2: Missing factors and stories with tens

GOAL Students find a missing factor with tens ($\square \times 80 = 320$ is 4, $2 \times \square = 180$ is 90) by thinking of the fact, and solve stories with tens where the product or a factor is missing.

About 45 minutes

I can find missing factors and solve stories with tens.

THE LESSON

- 1 Warm up** (5 min) Quick review: 3×30 , 2×90 , 5×70 . Then missing facts with no tens: $\square \times 8 = 32$, $6 \times \square = 36$.
- 2 Teach** (10 min) Write $\square \times 80 = 320$. Say 320 is 32 tens and 80 is 8 tens: what times 8 is 32? 4. Check: $4 \times 80 = 320$. Then $2 \times \square = 180$: 180 is 18 tens, 2 times 9 is 18, so the factor is 9 tens, 90. Then a story: "Muffins come in trays of 20. A bakery needs 120 muffins. How many trays?" Write $? \times 20 = 120$: 6 trays.
| Say: "I think in tens. 320 is 32 tens, and 4×8 is 32, so 4×80 is 320."
- 3 Try it together** (10 min) Pairs solve $\square \times 60 = 360$, $5 \times \square = 250$ and a story: "A van holds 40 boxes. How many boxes do 2 vans hold?" They write the equation with ? and check each answer by multiplying.
- 4 Practice** (15 min) Students do sheet 4 of Multiplying by Multiples of 10 (missing factors) and sheet 5 (word problems). Early finishers write their own tens story for a partner.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 7.2** and circle a face beside the "I can" line. On question 1, look for 7 and 90; 9 for $3 \times \square = 270$ means the student found the fact but not the tens. On question 2, look for $? \times 60 = 240$ and 4 boxes.

Need help? Use rods: build 320 as 32 rods and share them into groups of 8 rods.

Ready for more? Find all the ways to make 720 with a one-digit number times a multiple of 10.

GET READY

- Base-ten rods
- Whiteboards and markers
- The multiplication chart

WORDS TO USE

missing factor: the number we multiply by that we have to find

product: the answer to a multiplication

tens fact: a fact like $4 \times 8 = 32$ that tells $4 \times 80 = 320$

ASK

- How many tens is the product?
- Is the missing factor a one-digit number or a multiple of 10?
- How can you check your answer?

WATCH FOR

Writes 9 for $2 \times \square = 180$. Check it: 2×9 is 18, not 180. The factor must be 9 tens.

Divides the product by the wrong number in a story. Write the equation with ? first, then think of the fact.

ON ANIMAL MATH

PRINTABLE

Multiplying by Multiples of 10: sheets 4-5

TOOL

Base Ten Blocks: share the rods into equal groups

EXIT TICKET

3rd Grade Word Problems Exit Tickets: Exit Ticket 7.2



Word Problems and Tens

Lesson 7.3: Equal groups and array stories

GOAL Students write an equation with ? for equal groups and array stories, with the unknown in any place: the product (3 rows of 7), the size of each group (18 in 6 groups) or the number of groups (20 in groups of 4), and then solve.

About 45 minutes

I can write an equation for an equal groups story.

THE LESSON

- 1 Warm up** (5 min) Show 4 plates with 5 counters on each. Ask three questions: how many in all, how many plates, how many on each? Each one is a different unknown in $4 \times 5 = 20$.
- 2 Teach** (10 min) Read: "A garden has 3 rows of tomato plants with 7 in each row. How many plants?" Write $3 \times 7 = ?$. Then "18 stickers go equally on 6 pages. How many on each page?" Write $6 \times ? = 18$ or $18 \div 6 = ?$. Then "20 children make teams of 4. How many teams?" Write $? \times 4 = 20$. Each story has a total, a group size and a number of groups; one of them is the ?.
- 3 Try it together** (10 min) Pairs act out two stories with counters and plates: 18 apples in 2 bags, and 12 crayons in rows of 3. They write each equation with ?, then solve. Ask which number is the ?.
- 4 Practice** (15 min) Students do sheet 4 of Multiplication and Division Word Problems (the unknown in each place), with sheets 1 and 2 as a warm up if needed. Then a sheet from the Word Problems maker.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 7.3** and circle a face beside the "I can" line. On question 1, look for $24 \div 4 = ?$ or $4 \times ? = 24$; $24 \times 4 = ?$ means the student multiplied the total. On question 2, $40 \div 5 = ?$: 8 rows.

Need help? Act every story out with counters and plates before writing the equation.

Ready for more? Write one story with the same numbers for each unknown: 7, 3 and 21.

GET READY

- Counters and paper plates
- Whiteboards and markers
- The class chart of story types

WORDS TO USE

equal groups: groups that all have the same number

unknown: the number we do not know yet, shown with ?

array: things in rows and columns

ASK

- What is the total? Do you know it?
- Is the ? the number of groups or how many in each group?
- Read your answer back into the story. Does it fit?

WATCH FOR

Multiplies the two numbers in a division story (18×6). Ask what the total is. If it is in the story, the ? is a group or a group size.

Writes ? in the wrong place: $? \times 6 = 18$ for 18 stickers on 6 pages. Draw the 6 pages first, then ask how many on each.

ON ANIMAL MATH

PRINTABLE

Multiplication and Division Word Problems: sheet 4 (sheets 1-2 to warm up)

MAKER

Word Problems: Problem Type All Types, Multiplication and Division checked, Addition and Subtraction unchecked, Number Range 1-100

QUIZ

Word Problems Quiz: the Multiply and Divide level

EXIT TICKET

3rd Grade Word Problems Exit Tickets: Exit Ticket 7.3

Word Problems and Tens

Lesson 7.4: Measurement stories

GOAL Students solve measurement stories with $\times$ and $\div$ in centimeters, liters and kilograms: equal amounts put together (9 jugs of 2 liters) or a length or mass cut into equal parts (49 centimeters into 7 centimeter pieces).

About 45 minutes

I can multiply or divide to solve measurement stories.

THE LESSON

- 1 Warm up** (5 min) Hold up the liter bottle and the kilogram bag. Ask: which unit tells how much it holds, which tells how heavy it is, which tells how long a pencil is?
- 2 Teach** (10 min) Read: "A jug holds 2 liters. How many liters do 9 jugs hold?" Equal groups of liters: $9 \times 2 = ?$, 18 liters. Then "Ana cuts a 49 centimeter ribbon into pieces 7 centimeters long. How many pieces?" Draw a bar of 49 split into 7s: $49 \div 7 = ?$, 7 pieces. The answer's label can be the unit or the things.
Say: "Each jug is a group of 2 liters. A length cut into equal pieces is a division."
- 3 Try it together** (10 min) The class solves "16 kilograms of apples go in bags of 4 kilograms. How many bags?" with a bar model, then pairs solve "A pot holds 8 liters. How many liters do 5 pots hold?" and say which label goes on each answer.
- 4 Practice** (15 min) Students do sheet 5 of Multiplication and Division Word Problems (measurement stories), then sheet 3 of Mass and Liquid Volume Word Problems. Early finishers write a liters story for a partner.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 7.4** and circle a face beside the "I can" line. On question 1, $5 \times 4 = ?$: 20 kilograms; 9 means the student added. On question 2, $18 \div 3 = ?$: 6 meters; 54 means the student multiplied the length.

Need help? Act out a liter story with cups of water, or a length story with a paper strip cut into equal pieces.

Ready for more? Solve a story with two measurement steps: 3 bags of 5 kilograms and one of 4 kilograms.

ON ANIMAL MATH

- PRINTABLE** **Multiplication and Division Word Problems:** sheet 5
- PRINTABLE** **Mass and Liquid Volume Word Problems:** sheet 3
- QUIZ** **Word Problems Quiz:** the Multiply and Divide level
- QUIZ** **Mass and Liquid Volume Quiz:** the Stories level
- EXIT TICKET** **3rd Grade Word Problems Exit Tickets:** Exit Ticket 7.4

GET READY

- A liter bottle and a kilogram bag (rice or sand) to show
- A meter stick or centimeter ruler
- Whiteboards and markers

WORDS TO USE

liter: how much a big water bottle holds

kilogram: about the mass of a big bag of rice

centimeter: about the width of your little finger

ASK

- Is this equal groups put together, or one amount cut into equal parts?
- What unit goes with your answer?
- Is the answer more or less than the amount in the story? Why?

WATCH FOR

Adds the two numbers ($9 + 2$ liters). Draw the 9 jugs with 2 liters in each.

Leaves off the unit, or writes the wrong one. Ask "18 what?" and find the unit in the story.

Multiplies when a length is cut into pieces. Draw the bar and cut it: the pieces are smaller than the whole.

Word Problems and Tens

Lesson 7.5: Two-step stories

GOAL Students solve two-step stories with all four operations, writing an equation for each step: $\times$ or $\div$ first, then $+$ or $-$ (9 tables of 9 chairs, 15 taken), or $+$ or $-$ first, then $\times$ or $\div$ (30 red and 19 blue beads in 7 equal strings).

About 45 minutes

I can solve a story in two steps.

THE LESSON

- 1 Warm up** (5 min) Read a one-step story and ask only for the equation, no answer: "Jo has 2 packs of 9 juice boxes. How many juice boxes?" Then "There are 18 juice boxes and 11 are drunk. How many are left?"
- 2 Teach** (10 min) Read: "A room has 9 tables with 9 chairs at each. 15 children sit down. How many chairs are empty?" Step 1: $9 \times 9 = 81$ chairs. Step 2: $81 - 15 = 66$ empty chairs. Then "Leo has 30 red beads and 19 blue beads. He makes 7 strings with the same number of beads. How many on each?" Step 1: $30 + 19 = 49$. Step 2: $49 \div 7 = 7$ beads.
Say: "First I find what I need to know before I can answer. That is step 1. Step 2 uses that answer."
- 3 Try it together** (10 min) Pairs solve two stories, one $\times$ then $-$ and one $+$ then $\div$, writing Step 1 and Step 2. They show their bar model and say what the answer to step 1 means in the story.
- 4 Practice** (15 min) Students do sheet 1 of Two-Step Word Problems for 3rd Grade ($\times$ or $\div$ first) and sheet 2 ($+$ or $-$ first). Early finishers draw a bar model for each step of two stories on sheet 2.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 7.5** and circle a face beside the "I can" line. On question 1, Step 1 is $3 \times 7 = 21$ and Step 2 is $21 + 9 = 30$ cards. On question 2, $70 - 6 = 64$, then $64 \div 8 = 8$ stickers; 64 means the student stopped after step 1.

Need help? Give the steps on a frame: "Step 1: find how many in all. Step 2: find how many are left."

Ready for more? Write a two-step story that uses $\times$ and $-$ for a partner.

GET READY

- Whiteboards and markers
- Paper strips for bar models
- The class chart of story types

WORDS TO USE

step: one part of the work; step 2 uses the answer to step 1

two-step story: a story you solve in two parts

bar model: bars that show the parts and the whole

ASK

- What do you need to find first?
- What does your step 1 answer tell about the story?
- Which operation is step 2? How do you know?

WATCH FOR

Stops after step 1. Read the question again: does step 1 answer it?

Uses the story's numbers in the order they come. Draw the story first, then decide which step comes first.

Divides one part first ($30 \div 7$). Ask what is shared: all the beads go on the strings.

ON ANIMAL MATH

PRINTABLE

Two-Step Word Problems for 3rd Grade: sheets 1-2

QUIZ

Word Problems Quiz: the Two Steps, All Four level

EXIT TICKET

3rd Grade Word Problems Exit Tickets: Exit Ticket 7.5



Word Problems and Tens

Lesson 7.6: A letter for the unknown

GOAL Students write one equation with a letter for the unknown for a two-step story ($7 \times 2 + 5 = b$), solve it, and match a story to its equation. **About 45 minutes**

I can write an equation with a letter for the unknown.

THE LESSON

- 1 Warm up** (5 min) Write $n + 6 = 15$ and $4 \times b = 28$. Students say what each letter stands for and find it.
- 2 Teach** (10 min) Read: "Max buys 7 packs of 2 balls. His friend gives him 5 more. How many balls does he have?" Write b for the balls: $7 \times 2 + 5 = b$. We multiply first: $14 + 5 = 19$, so $b = 19$. Then "64 crayons go into 8 equal boxes. Lin takes 3 crayons out of one box. How many are left in that box?" $64 \div 8 - 3 = n$, so $n = 5$.
Say: "The letter stands for the answer I am looking for. I write the whole story as one equation, then solve it step by step."
- 3 Try it together** (10 min) Pairs match three story cards to three letter equations, then write their own equation for a fourth story and solve it. Ask why $7 \times 2 + 5$ and $7 + 2 \times 5$ are not the same.
- 4 Practice** (15 min) Students do sheet 3 of Two-Step Word Problems for 3rd Grade (circle the equation, then write one with a letter). Early finishers write a story for a partner's letter equation and trade.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 7.6** and circle a face beside the "I can" line. On question 1, look for $4 \times 4 - 3 = p$ (any letter) and 13 pens. On question 2, $9 + 3 \times 5 = k$ should be circled: 24 cookies; 32 means the student did $9 \times 3 + 5$.

Need help? Write the two steps first, then put them together into one equation with a letter.

Ready for more? Write a story for $6 \times 3 - 4 = m$ and solve it.

GET READY

- Whiteboards and markers
- Story cards with two-step stories
- Cards with letter equations to match

WORDS TO USE

letter for the unknown: a letter like n that stands for the number we find

equation: a number sentence with an equal sign

expression: numbers and signs with no equal sign, like $7 \times 2 + 5$

ASK

- What does your letter stand for?
- Which part of the equation do you work first?
- Does your equation tell the whole story?

WATCH FOR

Writes only one step: $7 \times 2 = b$. Read the story again: what happens after the packs?

Works left to right: $5 + 2 \times 7 = 49$. Multiply first. Say it: 2×7 is 14, then add the 5.

ON ANIMAL MATH

PRINTABLE

Two-Step Word Problems for 3rd Grade: sheet 3

QUIZ

Word Problems Quiz: the Two Steps, All Four level

EXIT TICKET

3rd Grade Word Problems Exit Tickets: Exit Ticket 7.6



Word Problems and Tens

Lesson 7.7: Is it reasonable?

GOAL Students round each number to the nearest hundred to estimate a sum or difference, and use the estimate to decide whether an answer is reasonable: $312 + 451 = 763$ is close to 800, but $623 - 274 = 451$ is far from 300.

About 45 minutes

I can estimate to check if an answer makes sense.

THE LESSON

- 1 Warm up** (5 min) Round to the nearest hundred on the number line: 312, 451, 274 and 650 (halfway rounds up). Students show where each number sits between two hundreds.
- 2 Teach** (10 min) Write $312 + 451 = 763$. Round: $300 + 500 = 800$. 763 is close to 800, so it is reasonable. Then $623 - 274 = 451$. Round: $600 - 300 = 300$. 451 is far from 300, so it is not reasonable. Work it out: $623 - 274 = 349$. Then a story: "A school has 589 books and gets 205 more. About how many books?" $600 + 200 = 800$.
Say: "I round each number to the nearest hundred and solve in my head. If the answer is far from my estimate, I check it again."
- 3 Try it together** (10 min) Pairs get cards with an answer to check. They estimate, then sort the cards into reasonable and not reasonable, and fix the wrong ones.
- 4 Practice** (15 min) Students do sheet 4 of Two-Step Word Problems for 3rd Grade (is the answer reasonable? it rounds to the nearest ten), then sheets 2 and 3 of Estimate or Exact?. Early finishers try a Rounding Numbers sheet.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 7.7** and circle a face beside the "I can" line. On question 1, look for $400 + 300 = 700$ and No, since 595 is far from 700. On question 2, look for $500 + 300 = 800$ animals; 700 means 487 was rounded down.

Need help? Round on a number line by hundreds every time, and say the two hundreds the number is between.

Ready for more? Make up a wrong answer that an estimate would catch, and one it would not.

GET READY

- Number lines from 0 to 1,000 by hundreds
- Whiteboards and markers
- Cards with answers to check, some wrong

WORDS TO USE

estimate: a number close to the answer, found quickly

round: go to the nearest ten or hundred

reasonable: close enough to the estimate to make sense

ASK

- What hundred is this number closest to?
- How far is the answer from your estimate?
- Is this a story where about is good enough?

WATCH FOR

Rounds 451 down to 400. Find 451 on the number line: is it nearer 400 or 500?

Thinks any answer near the numbers is reasonable. Compare it to the estimate, not to the numbers in the problem.

Works out the exact answer instead of estimating. Round first, then solve the easy problem in your head.

ON ANIMAL MATH

PRINTABLE

Two-Step Word Problems for 3rd Grade: sheet 4

PRINTABLE

Estimate or Exact? sheets 2-3

MAKER

Rounding Numbers: Round to Nearest 100, Number Range Lowest 100, Highest 999

QUIZ

Rounding Quiz: the Estimate level

EXIT TICKET

3rd Grade Word Problems Exit Tickets: Exit Ticket 7.7

Word Problems and Tens

Lesson 7.8: 2-digit times 1-digit

GOAL Students multiply a 2-digit number by a 1-digit number by breaking it into tens and ones: 36×4 is $30 \times 4 + 6 \times 4$, $120 + 24$, 144, shown with base-ten blocks and an area model.

I can multiply a 2-digit number by a 1-digit number.

About 45 minutes

★ Taught in 3rd grade in some states

THE LESSON

- 1 Warm up** (5 min) Quick tens facts: 30×4 , 80×3 , 10×5 . Then break apart numbers into tens and ones: 36 is 30 and 6, 42 is 40 and 2.
- 2 Teach** (10 min) Build 4 groups of 36 with blocks: 12 rods and 24 ones. Trade 20 ones for 2 rods: 14 rods and 4 ones, 144. Draw an area model: 36 across the top as 30 and 6, 4 down the side. $4 \times 30 = 120$ and $4 \times 6 = 24$, so $120 + 24 = 144$. Then $42 \times 3 = 120 + 6 = 126$.
Say: "I break the big number into tens and ones, multiply each part, and add the parts."
- 3 Try it together** (10 min) Pairs solve 17×5 with blocks and an area model, then 43×2 with an area model only. They check the two ways give the same answer.
- 4 Practice** (15 min) Students do sheet 2 of Multiply 2-Digit by 1-Digit (area models) and sheet 3 (partial products in a column). Early finishers do sheet 5 (word problems).
- 5 Exit ticket** (5 min) Students do **Exit Ticket 7.8** and circle a face beside the "I can" line. On question 1, look for 60 and 24 in the parts and 84; 68 means the student multiplied only the tens ($60 + 8$). On question 2, look for $80 + 12 = 92$.

Need help? Build each problem with base-ten blocks and count the rods and ones before writing.

Ready for more? Multiply a 2-digit number by 6, 7 or 8 and check with an estimate.

GET READY

- Base-ten blocks for each pair
- Grid paper or whiteboards for area models
- A multiplication chart

WORDS TO USE

area model: a rectangle split into parts to show a product

partial product: the answer for one part, like $30 \times 4 = 120$

break apart: split a number into tens and ones

ASK

- What are the tens and the ones?
- What is each partial product?
- Is your answer about right? Round and check.

WATCH FOR

Multiplies only the tens or only the ones. Point to both parts of the area model: each one gets multiplied.

Writes $3 \times 4 = 12$ for 30×4 . Say it in tens: 3 tens times 4 is 12 tens, 120.

Adds the partial products wrong when ones make a new ten. Add with blocks or line them up in a column.

ON ANIMAL MATH

PRINTABLE

Multiply 2-Digit by 1-Digit: sheets 2, 3 and 5

MAKER

Column Math Equations: Multiplication, Range Within 100, Set Digit Count, Digits 2 digits

TOOL

Base Ten Blocks: build equal groups of tens and ones

EXIT TICKET

3rd Grade Word Problems Exit Tickets: Exit Ticket 7.8

Word Problems and Tens

Lesson 7.9: Times as many

GOAL Students read a multiplication as a comparison: 6×12 is 6 times as many as 12. They draw strip diagrams with equal bars and solve times as many stories.

I can solve times as many stories.

About 45 minutes
★ Taught in 3rd grade in some states

THE LESSON

- 1 Warm up** (5 min) Build a train of 3 cubes. A partner builds one 4 times as long: 4 trains of 3, 12 cubes. Try 2 times as long as 5.
- 2 Teach** (10 min) Read: "Ella has 17 crayons. Ben has 3 times as many. How many crayons does Ben have?" Draw Ella's bar of 17 and Ben's bar as 3 bars of 17 with a brace and $?: 3 \times 17 = ?$, 51 crayons. Then compare it with "Ben has 3 more than Ella": that is $17 + 3 = 20$. Then 6×12 : a bar of 12 and a bar 6 times as long.
Say: "Times as many means the same amount again and again, so I multiply. More than means I add."
- 3 Try it together** (10 min) Pairs draw strip diagrams for "A tree is 24 feet tall. A building is 2 times as tall" and "Kai read 11 pages. Mia read 7 times as many," then solve each.
- 4 Practice** (15 min) Students do sheet 2 of Times as Many (strip diagrams) and sheet 4 (stories). Early finishers do sheet 5 (more than or times as many?).
- 5 Exit ticket** (5 min) Students do **Exit Ticket 7.9** and circle a face beside the "I can" line. On question 1, look for $5 \times 14 = ?$: 70 shells; 19 means the student added 5 more. On question 2, look for 64 beads on the line under the brace; 20 means the student added 4 more.

Need help? Build the bars with cube trains before drawing them.

Ready for more? Write a story for 3 times as many as 21 and one for 3 more than 21.

GET READY

- Cube trains or paper strips
- Whiteboards and markers

WORDS TO USE

times as many: the same amount again and again

strip diagram: bars drawn to show how amounts compare

compare: look at two amounts to see how they are related

ASK

- How many bars do you need for the bigger amount?
- Is this times as many or more than?
- What multiplication does your diagram show?

WATCH FOR

Adds the two numbers in a times as many story. Draw the bars: 3 times as many is 3 bars of 17.

Draws bars of different sizes. Each bar of the bigger amount is the same length as the first bar.

ON ANIMAL MATH

PRINTABLE

Times as Many: sheets 2, 4 and 5

EXIT TICKET

3rd Grade Word Problems Exit Tickets: Exit Ticket 7.9

Word Problems and Tens

Lesson 7.10: True or false with $\times$ and $\div$

GOAL Students decide whether an equation with $\times$ or $\div$ is true by finding the value of each side (2 $\times$ 6 = 3 $\times$ 4 is true, 18 $\div$ 3 = 2 $\times$ 4 is false) and write the missing number that makes one true. **About 45 minutes** ★ Taught in 3rd grade in some states

I can tell if an equation with $\times$ or $\div$ is true.

THE LESSON

- 1 Warm up** (5 min) Show 12 counters as 2 rows of 6 and as 3 rows of 4. Ask: are these the same amount? Write $2 \times 6 = 3 \times 4$.
- 2 Teach** (10 min) Draw a balance. Put $20 \div 4$ on one side and $10 \div 2$ on the other: 5 and 5, so $20 \div 4 = 10 \div 2$ is true. Then $18 \div 3 = 2 \times 4$: 6 and 8, so it is false. Then $3 \times 6 = 9 \times \square$: $18 = 9 \times \square$, so $\square$ is 2.
Say: "The equal sign means both sides have the same value. I find each side, then I check."
- 3 Try it together** (10 min) Pairs hold up True or False cards for $5 \times 6 = 3 \times 10$, $12 \div 2 = 3 \times 3$ and $6 \times 3 = 3 \times 6$, and tell why. Then they find the box in $16 \div 2 = \square \div 3$.
- 4 Practice** (15 min) Students do sheet 1 of True or False: Multiplication & Division (balances), sheet 2 (true or false) and sheet 4 (missing numbers). Early finishers do sheet 3.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 7.10** and circle a face beside the "I can" line. On question 1, look for True for $2 \times 8 = 4 \times 4$ and False for $36 \div 9 = 2 \times 3$. On question 2, look for 6 and 12; 3 for $30 \div 5 = \square \div 2$ means the student divided instead of multiplying.

Need help? Use counters to build both sides of each equation.

Ready for more? Write three equations of your own, two true and one false, for a partner.

GET READY

- A pan balance or a drawing of one
- Whiteboards and markers
- True and False cards

WORDS TO USE

equal sign: means both sides have the same value

true: both sides are the same

false: the sides are not the same

ASK

- What is the value of the left side? The right side?
- Are they the same?
- What number makes both sides equal?

WATCH FOR

Thinks the answer always comes right after the equal sign. Find the value of each side, then compare.

Says $8 \div 2 = 2 \div 8$ is true. Share 8 counters into 2 groups, then try 2 counters into 8 groups.

ON ANIMAL MATH

PRINTABLE

True or False: Multiplication & Division: sheets 1-4

TOOL

Multiplication Chart: find two facts with the same product

EXIT TICKET

3rd Grade Word Problems Exit Tickets: Exit Ticket 7.10

