

Lesson 2 Place Value —Part 1

Objective

- Identify the value and the place of each digit in a four-digit number.

Lesson Materials

- Place-value Cards (BLM)
- Place-value discs
- Place-value Organizer (BLM)

Think

Provide students with place-value discs and a Place-value Organizer (BLM). Have them try to solve the **Think** problem independently.

Learn

Discuss the **Learn** examples. Ask students:

- What is meant by the “value” of each digit?
- What does a digit stand for, and what is its value?

Students will continue working with digits and their values throughout the **Do** portion of this lesson. In addition to asking how many tens there are, ask, “What is the value of the digit in the tens place?”



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Lesson 2
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Think

How many beads do I have altogether?

8
1-2 Place Value — Part 1

9

Learn

Thousands	Hundreds	Tens	Ones
2	3	6	8

$2,000 + 300 + 60 + 8 = 2,368$

Dion has **2,368** beads.

2,000 The digit 2 in 2,368 is in the thousands place. It stands for 2 thousands. Its value is 2,000.

300 The digit 3 in 2,368 is in the hundreds place. It stands for 3 hundreds. Its value is **300**.

60 The digit 6 in 2,368 is in the tens place. It stands for **6** tens. Its value is 60.

8 The digit 8 in 2,368 is in the ones place. It stands for 8 **ones**. Its value is **8**.

2,368

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1-2 Place Value — Part 1

Do

If needed, provide additional practice with different four-digit numbers and questions similar to ② and ⑤, where the values given are not necessarily in order from greatest to least.

- ⑤ It is important that students are able to compose the number when the numbers being added are not in order from greatest to least.

If students are confused, give them Place-value Cards (BLM) to make the number and think about what is missing.

Activity

▲ Place-value Hangman

Students play hangman using four-digit numbers.

Player One makes a four-digit number and draws 4 lines:

_____, _____, _____, _____

Player Two tries to guess the number by asking yes/no questions like:

- Is there a 3 in the tens place?
- Is the digit in the hundreds place greater than 5?
- Is the value of the thousands digit less than 4?

Exercise 2 • page 4

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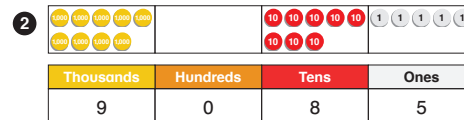
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Do

- ① Show 4,573 with place-value cards.



- (a) The digit 4 in 4,573 is in the thousands place.
 (b) The digit 5 in 4,573 stands for 5 hundreds.
 (c) The digit 7 in 4,573 stands for 7 tens.
 (d) The digit 3 in 4,573 is in the ones place.

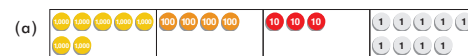


- (a) The digit 5 in 9,085 is in the ones place.
 (b) The digit 0 in 9,085 is in the hundreds place. Its value is 0.
 (c) The value of the digit 9 in 9,085 is 9,000.
 (d) The digit 8 in 9,085 stands for 8 tens.

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1-2 Place Value — Part 1

- ③ Write the number.



7,439



8,604



5,910

- ④ (a) Write the number in words.

four thousand, nine hundred eighty two two thousand, three hundred eight

4,982 2,308 9,250 5,029

nine thousand, two hundred fifty five thousand, twenty-nine

- (b) In what place is the digit 2 in each number, and what is its value?
 ones, 2 thousands, 2,000 hundreds, 200 tens, 20

- ⑤ (a) $6,069 = 6,000 + 60 + 9$
 (b) $7,402 = 7,000 + 400 + 2$
 (c) $5,300 = 5,000 + 300$
 (d) $5,008 = 5,000 + 8$
 (e) $1,953 = 900 + 1,000 + 3 + 50$
 (f) $8,808 = 8 + 800 + 8,000$

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Exercise 2 • page 4

1-2 Place Value — Part 1

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Lesson 9 2-Step Word Problems

Objective

- Solve two-step word problems involving all four operations.

Lesson Materials

- Strips of paper

Think

Pose the problem in **Think** and have students draw models. Discuss the students' models.

Ask students:

- How is the problem similar to the ones we did yesterday? (It is about multiplying and dividing. I think I can draw a comparison model.)
- How is it different? (There are more steps in this one. It's longer.)

Learn

Have students discuss the bar model in **Learn** and compare their own models with the one in the textbook.

What information do we know?

- Mei has some ribbon and she cut off 2 pieces.
- The 2nd piece of ribbon is longer than the 1st piece.
- There is still ribbon on the spool.

What do we need to find?

- How long each piece of ribbon is.

Have students begin by drawing models to represent the 1st and 2nd pieces of ribbon, adding the third bar to represent the amount of ribbon left on the spool.

Students begin by subtracting the amount of ribbon left on the spool:

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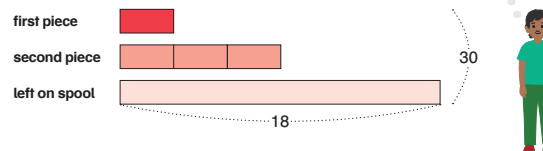
Lesson 9 2-Step Word Problems

9

Think

Mei had 30 m of ribbon.
She cut off 2 pieces of ribbon.
The second piece is 3 times as long as the first piece.
There is still 18 m of ribbon left on the spool.
How long is each piece?

Learn



$$4 \text{ units} \rightarrow 30 - 18 = 12$$

$$1 \text{ unit} \rightarrow 12 \div 4 = 3$$

The first piece is 3 m long.

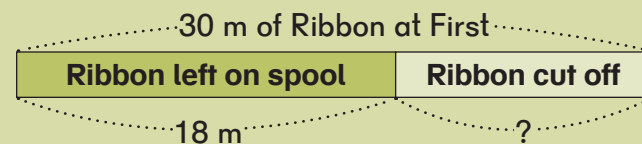
$$3 \text{ units} \rightarrow 3 \times 3 = 9$$

The second piece is 9 m long.

Check your answers.
Does $3 + 9 + 18 = 30$?

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4-9 2-Step Word Problems



$$30 \text{ m} - 18 \text{ m} = 12 \text{ m}$$

Then finding the length of the 2 pieces:



$$4 \text{ units} \rightarrow 12 \text{ m}$$

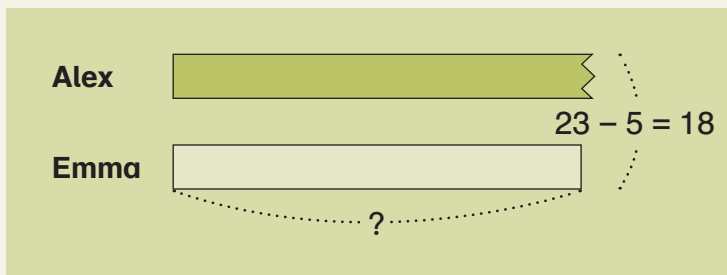
$$1 \text{ unit} \rightarrow 12 \div 4 = 3 \text{ m}$$

$$3 \text{ units} \rightarrow 3 \times 3 = 9 \text{ m}$$

Do

- 2 This model shows a part-whole representation of addition and multiplication. Ask students:
- Why are some of the parts equal and one is not?
 - Could this be drawn with two models? (Or with a comparison model?)
- 3 This problem is a sum and difference bar model. This pattern will be used throughout the **Dimensions Math**[®] program.

Sofia's thought provides a hint. If there are equal units, this becomes an easier problem. Dion can make 2 equal units by taking 5 from the total amount of dinosaurs.



To demonstrate Sofia's thoughts, use two strips of paper that are proportional in length to the bars in the textbook. Fold behind or tear off the piece of Alex's bar that represent 5 dinosaurs to show that what remain of Alex's bar and Emma's bar are equal units.

Once we find two equal units, we can divide to find the value of one unit.

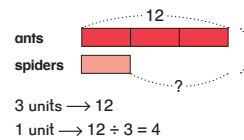
- 4 — 5 When discussing these problems, ask students:
- Why are there two models?
 - Are these comparison problems?

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Do

- 1 Mei made 3 times as many ants as spiders. She made 12 ants.

- (a) How many animals did she make?
(b) How many more ants than spiders did she make?



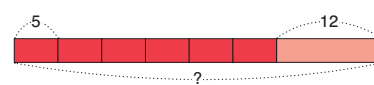
Find the value of 1 unit first and use that for both problems.



- (a) 4 units $\rightarrow 4 \times 4 = 16$ | She made 16 animals.
(b) 2 units $\rightarrow 2 \times 4 = 8$ | She made 8 more ants than spiders.

- 2 Ms. Davis bought 6 skeins of wool yarn for \$5 each and a set of knitting needles for \$12. How much did she spend?

Find the cost of the yarn first.



$$30 + 12 = 42 \text{ (total spent)}$$

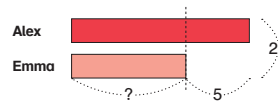
She spent \$42.



4-9 2-Step Word Problems

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- 3 Alex and Emma together made 23 dinosaurs. Alex made 5 more dinosaurs than Emma. How many dinosaurs did Emma make?



If I take 5 away, they will both have the same number.

We need to find how many Emma made. Make her bar the unit.

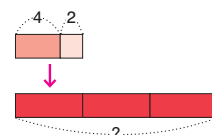
$$2 \text{ units} \rightarrow 23 - 5 = 18$$

$$1 \text{ unit} \rightarrow 18 \div 2 = 9$$

Emma made 9 dinosaurs.



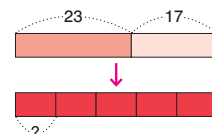
- 4 Dexter bought 3 packs of foam brushes. There were 4 thin brushes and 2 thick brushes in each pack. How many brushes did he buy?



$$1 \text{ unit} \rightarrow 4 + 2 = 6$$

$$3 \text{ units} \rightarrow 3 \times 6 = 18 \text{ 18 brushes}$$

- 5 Sita polished 23 rocks on Monday and 17 rocks on Tuesday. She put the rocks equally into 5 boxes. How many rocks are in each box?



$$23 + 17 = 40$$

$$40 \div 5 = 8$$

8 rocks

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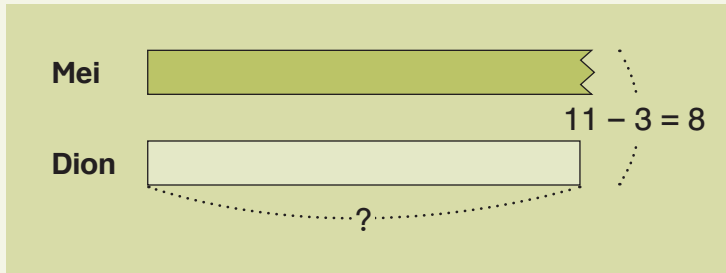
4-9 2-Step Word Problems

6 Discuss Alex's thought. Ask students:

- Why is Dion being used to represent 1 unit?

Additionally, this problem can be solved similarly to

3 by subtracting the difference between Mei and Dion, leaving 2 equal units.

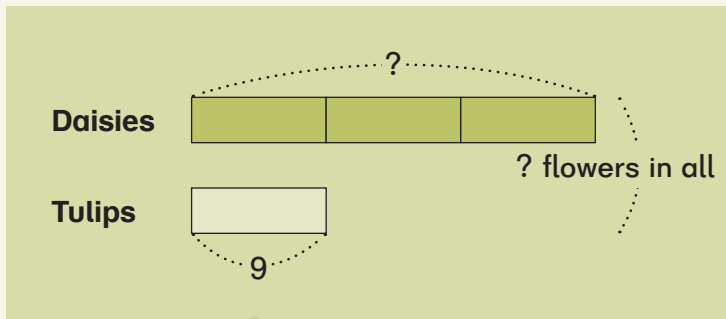


2 units \longrightarrow 8 turtles

1 unit $\longrightarrow 8 \div 2 = 4$ turtles

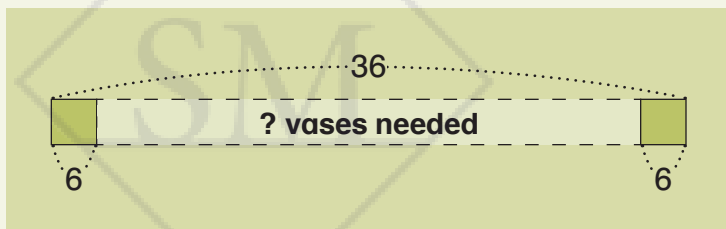
“Mei made $4 + 3$, or 7, turtles.”

7 Students may need to draw the two steps separately to see “3 times as many,” and then find how many flowers in all.



1 unit \longrightarrow 9 flowers

4 units $\longrightarrow 4 \times 9 = 36$ flowers



$36 \div 6 = 6$. Asimah uses 6 vases.

8–9 Discuss the models students draw and any alternative methods they use to solve the problems.

6 Mei and Dion together made 11 turtles. Mei made 3 more turtles than Dion. How many turtles did Mei make?

Make Mei's bar the unit. If Dion had made 3 more then...

2 units $\rightarrow 11 + 3 = 14$
1 unit $\rightarrow 14 \div 2 = 7$ 7 turtles

7 Asimah has 9 tulips. She has 3 times as many daisies as tulips. She arranges 6 flowers in each vase. How many vases does she use?

4 \times 9 = 36
36 \div 6 = 6
6 vases

8 A pack of 5 paint pens cost \$3. Mr. Ikeda bought 20 paint pens. How much did he pay? $20 \div 5 = 4$ (packs)
 $4 \times 3 = 12$ (cost of 4 packs)
\$12

9 Hudson has 4 times as many crayons as Elena. He has 24 more crayons than Elena does. How many crayons do they have altogether?

1 unit $\rightarrow 24 \div 3 = 8$
5 units $\rightarrow 5 \times 8 = 40$ 40 crayons

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4-9 2-Step Word Problems 131

Exercise 9 • page 119

Lesson 10 Practice

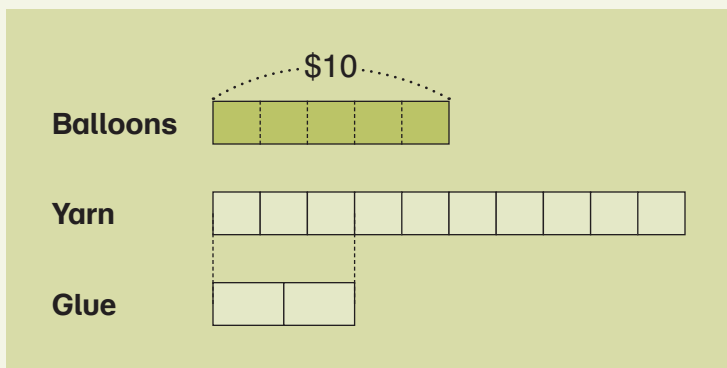
Objective

- Practice topics from the chapter.

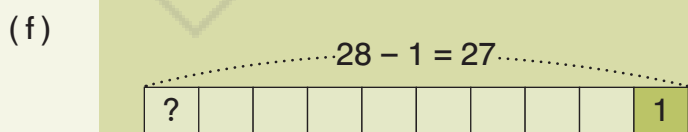
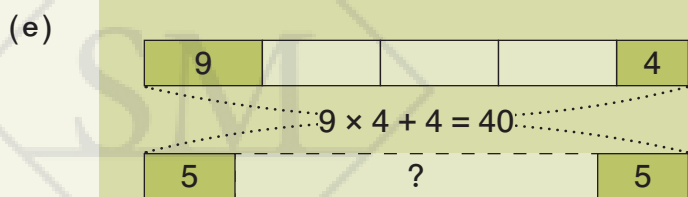
Have students practice with activities from the chapter to ensure they know their multiplication and division facts for 2 through 5.

Provide additional support and practice opportunities as needed.

- 5 A sample model is given. Students may draw the models differently to answer individual problems.



- (a) 5 units \longrightarrow \$10
1 unit \longrightarrow $\$10 \div 5 = \2
- (b) 1 unit \longrightarrow \$2
10 units \longrightarrow $10 \times \$2 = \20
- (c) 1 unit \longrightarrow \$2
3 units \longrightarrow $3 \times \$2 = \6
(3 units of yarn = 2 units of glue)
1 unit of glue \longrightarrow $\$6 \div 2 = \3



Lesson 10 Practice

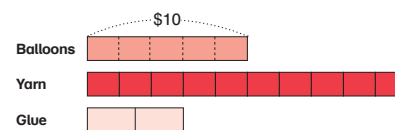
P 10

- 1 Find the value.
- (a) $8 \div 4 = 2$ (b) $4 \times 7 = 28$ (c) $14 \div 2 = 7$
 (d) $4 \times 4 = 16$ (e) $32 \div 4 = 8$ (f) $0 \times 10 = 0$
 (g) $35 \div 5 = 7$ (h) $27 \div 3 = 9$ (i) $18 \div 3 = 6$
 (j) $16 \div 2 = 8$ (k) $5 \div 5 = 1$ (l) $0 \div 10 = 0$
- 2 (a) $5 \times 4 = 20$ (b) $0 \times 5 = 0$ (c) $24 = 8 \times 3$
 (d) $3 \div 1 = 3$ (e) $0 \div 5 = 0$ (f) $2 = 4 \div 2$
- 3 Find the quotient and remainder.
- (a) $7 \div 2 = 3 \text{ R } 1$ (b) $10 \div 3 = 3 \text{ R } 1$ (c) $22 \div 4 = 5 \text{ R } 2$
 (d) $16 \div 5 = 3 \text{ R } 1$ (e) $42 \div 10 = 4 \text{ R } 2$ (f) $88 \div 10 = 8 \text{ R } 8$
 (g) $26 \div 3 = 8 \text{ R } 2$ (h) $26 \div 4 = 6 \text{ R } 2$ (i) $26 \div 5 = 5 \text{ R } 1$
- 4 Are the following numbers odd or even?
- (a) 12 even (b) 11 odd (c) 13 odd (d) 16 even
 $12 \div 2 = 6$ $11 \div 2$ is 5 R 1 $13 \div 2$ is 6 R 1 $16 \div 2 = 8$

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4-10 Practice

- 5 Katie is making decorative balls out of yarn to sell at the farmer's market on Kids Vending Day. She bought 1 pack of balloons, 10 skeins of yarn, and 2 bottles of glue. She spent \$10 on the pack of balloons. The balloons cost 5 times as much as 1 skein of yarn. The 2 bottles of glue cost the same as 3 skeins of yarn.



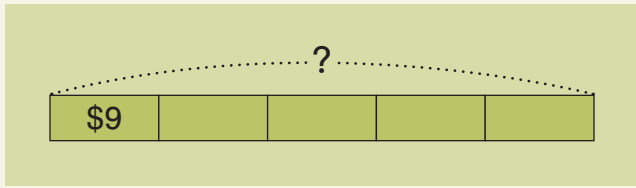
- (a) How much does 1 skein of yarn cost?
 $10 \div 5 = 2$; \$2
- (b) How much did she spend on the yarn? Different models may be drawn for each step.
 $10 \times 2 = 20$; \$20
- (c) How much does 1 bottle of glue cost? Methods of solution may vary.
 $3 \times 2 = 6$; $6 \div 2 = 3$; \$3
- (d) How much did she spend in all?
 $10 + 20 + 6 = 36$; \$36
- (e) Katie made 9 each of red, yellow, orange, and green balls. She made 4 brown balls. She displayed the balls by putting 5 in each bowl. How many bowls did she use?
 $9 \times 4 = 36$
 $36 + 4 = 40$
 $40 \div 5 = 8$
8 bowls
- (f) She sold all 9 red balls. One buyer gave her \$1 extra as a tip. She received \$28 from selling the red balls. How much did she sell each red ball for?
 $28 - 1 = 27$
 $27 \div 9 = 3$; \$3

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4-10 Practice

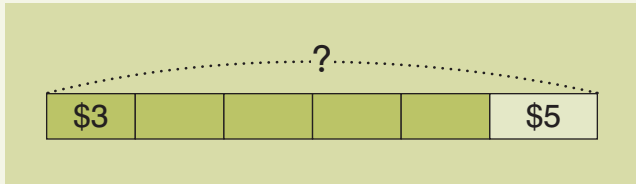
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6 (a)



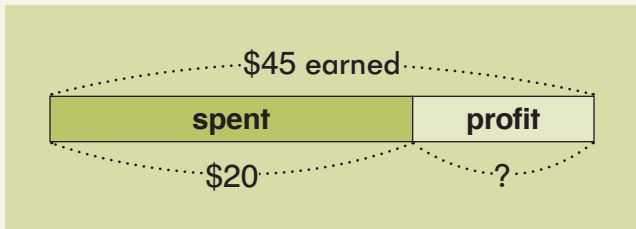
1 unit \longrightarrow \$9
 5 units \longrightarrow $5 \times \$9 = \45
 Josef received \$45.

(b)



1 unit \longrightarrow \$3
 5 units \longrightarrow $5 \times \$3 = \15
 $\$15 + \$5 = \$20$
 Josef spent \$20.

(c)



7 Arman represents the unit. Evan has 1 unit + 2 more pinecones. Mila has twice as many as Evan, or 2 units + 4 more pinecones. Altogether they have 4 units + 6 more pinecones = 30.

4 units \longrightarrow $30 - 6 = 24$
 1 unit \longrightarrow $24 \div 4 = 6$ pinecones

8 Encourage students to consider 7 to help draw a model.

Activity

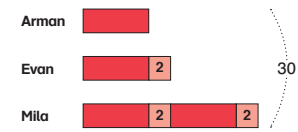
▲ Multiplication and Division Kaboom

Materials: Kaboom Cards (BLM), multiplication and division fact cards for 0 to 5

6 Josef made a total of 5 birdhouses and sold them all for \$9 each at the market on Kids Vending Day.

- (a) How much money did he receive? $5 \times 9 = 45$
 \$45
- (b) The materials for each birdhouse cost \$3. The fee for the booth at the market was \$5. How much did he spend? $5 \times 3 = 15$
 $15 + 5 = 20$
- (c) How much profit did he make? $45 - 20 = 25$
 \$25

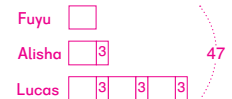
7 Evan collected 2 more pinecones than Arman. Mila collected twice as many pinecones as Evan. Altogether, they collected 30 pinecones.



- (a) How many pinecones did Arman collect?
 $3 \times 2 = 6$
 6 pinecones
- (b) How many pinecones did Mila collect?
 $6 + 2 = 8$
 $8 \times 2 = 16$ 16 pinecones

8 Alisha collected 3 more pinecones than Fuyu. Lucas collected 3 times as many pinecones as Alisha. Altogether, they collected 47 pinecones.

- (a) How many pinecones did Fuyu collect?
 $4 \times 3 = 12$
 $5 \text{ units} \rightarrow 47 - 12 = 35$
 $1 \text{ unit} \rightarrow 35 \div 5 = 7$
 7 pinecones
- (b) How many pinecones did Lucas collect?
 $7 + 3 = 10$
 $10 \times 3 = 30$
 30 pinecones



Exercise 10 • page 123

Shuffle fact cards and 3 Kaboom Cards (BLM) together and place them facedown in a pile. Players take turns drawing a card and stating the product or quotient.

Students keep the cards they answer correctly, and return the ones that they answer incorrectly. When a student draws a Kaboom Card (BLM), he must return all of his collected cards to the pile.

The player with the most cards at the end of the time limit is the winner.

Exercise 10 • page 123

Lesson 4 Multiplication with Regrouping Ones

Objective

- Multiply a two-digit number by a one-digit number with regrouping ones.

Lesson Materials

- Place-value discs

Think

Provide students with place-value discs and have them work the **Think** problem independently.

Have students write an equation and discuss how they found their answers.

Ask students:

- How is this problem different from the ones you solved in the previous lesson? (We have to regroup ones.)
- How is it the same? (We can still multiply the digits in each place.)

Discuss student strategies for solving the problem. Ask them what they can do when they have more than 9 in the ones column.

Learn

Work through the **Think** problem with students as demonstrated in **Learn**. Have students work along with place-value discs as the steps are modeled.

Emphasize how to record the regrouped tens in the written algorithm, and the fact that this regrouped ten is not multiplied again when multiplying tens, but added in after multiplying tens.

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Lesson 4 Multiplication with Regrouping Ones

4

Think



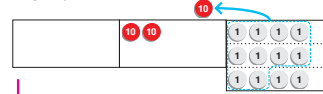
Mei ran 24 miles each week for 3 weeks to prepare for the race. How many miles did she run to prepare for the race?

Learn

$$24 \times 3$$



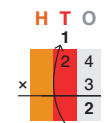
Multiply the ones.
Regroup the ones.



$$4 \text{ ones} \times 3 = 12 \text{ ones} \\ = 1 \text{ ten } 2 \text{ ones}$$



Write the regrouped ten above the tens.



$$4 \text{ ones} \times 3$$

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5-4 Multiplication with Regrouping Ones

Discuss the regrouping from 12 ones to 1 ten and 2 ones. Ensure that students trade ten 1-discs for one 10-disc and place it above the rest of the 10-discs. Help students to understand that the regrouped tens do not get multiplied. Students who struggle with this will have a difficult time with problems where regrouping occurs in both the ones and the tens place.

Ask students:

- What is similar about the ways the problem has been solved by Dion, Emma, and Sofia?
- Whose way is quickest and why? (“Emma’s method, because you don’t have to add again,” or, “Sofia’s method, because we can do it mentally.”)

After the students have worked the problem with place-value discs, have them compare their methods from **Think** with the method shown in the textbook.

Multiply the tens.

2 tens \times 3 = 6 tens

Then, add in the regrouped ten.

6 tens + 1 ten = 7 tens

This ten is from multiplying the ones. Do not multiply it again.

H	T	O
	2	4
		3
	7	2

(2 tens \times 3) + 1 ten

24
\times 3
72

24	\times 3	12 \leftarrow 4 \times 3
60	\leftarrow 20 \times 3	72

I can use mental math.

$24 \times 3 = 60 + 12$

20 4

Mei ran **72** miles.



Do

- 1 Struggling students may need to work these problems with place-value discs to see the regrouping step.

Mei reminds students not to multiply the regrouped tens.

- 5 Students can use any of the methods they have learned. Have them share why they chose their methods after solving the problem.

Exercise 4 • page 139

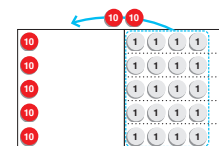
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Do

- 1 Multiply 14 by 5.

$$\begin{array}{r} 2 \\ 14 \\ \times 5 \\ \hline 70 \end{array}$$

4 ones \times 5
(1 ten \times 5) + 2 tens



$$\begin{array}{r} 14 \\ \times 5 \\ \hline 20 \\ 50 \\ \hline 70 \end{array}$$

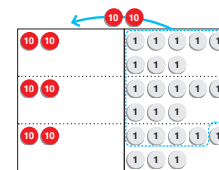
← 4 \times 5
← 10 \times 5

Remember not to multiply the regrouped tens.



- 2 Multiply 3 by 28.

$$\begin{array}{r} 2 \\ 28 \\ \times 3 \\ \hline 84 \end{array}$$

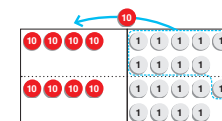


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5-4 Multiplication with Regrouping Ones

- 3 Multiply 49 by 2.

$$\begin{array}{r} 1 \\ 49 \\ \times 2 \\ \hline 98 \end{array}$$



- 4 What are the missing digits?

(a)
$$\begin{array}{r} 3 \\ 18 \\ \times 4 \\ \hline 72 \end{array}$$

(b)
$$\begin{array}{r} 1 \\ 35 \\ \times 2 \\ \hline 70 \end{array}$$

- 5 Find the value.

(a) $17 \times 5 = 85$

(b) $38 \times 2 = 76$

(c) $25 \times 3 = 75$

(d) $24 \times 4 = 96$

(e) $7 \times 15 = 105$

(f) $5 \times 19 = 95$

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- 6



There are 18 sponsors for the race.

Each sponsor donated 3 raffle prizes.

How many raffle prizes are there?

$$18 \times 3 = 54$$

54 raffle prizes

Exercise 4 • page 139

5-4 Multiplication with Regrouping Ones

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