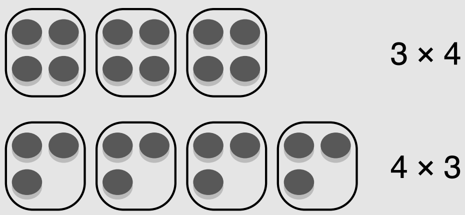
Notes

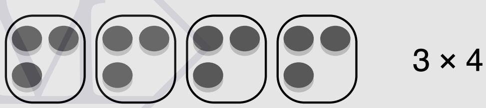
In Dimensions Math® 1B, students were introduced to the idea of finding the total when given the number of equal groups and the quantity in each group. In Dimensions Math® 2A, they learned to use the multiplication symbol and write multiplication equations.

In earlier levels, the multiplication symbol was interpreted as "times." The first number in the multiplication expression represented the number of groups, and the second the number in each group. This was so that students could learn that, for example, 3 × 4 = 4 × 3 means that 3 groups of 4 = 4 groups of 3, and not simply, "the factors can be in any order."



3 × 4 = 4 × 3
3 groups of 4 = 4 groups of 3

However, the symbol can also be interpreted as "multiplied by," which students will learn in this chapter. That is, 3 × 4 means 3 objects in 4 groups, or 3 "multiplied by" 4.



3 × 4 = 12
3 multiplied by 4 is 12

In some situations, such as when learning the multiplication algorithm in the next chapter, it will be easier to interpret the multiplication symbol to mean "multiplied by" when the greater number is written first (598 × 3) so that they can use manipulatives to find the answer.

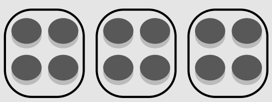
Do not force a specific order for the factors in a multiplication expression, and do not burden your student with having to read the symbol as "times" or "multiplied by" depending on the situation.

In Dimensions Math® 2A and 2B, students learned all the multiplication facts for 2, 3, 4, 5, and 10, as well as some strategies for computing new facts from known facts. For example, to find the product for 6 × 4 or 4 × 6, they could just add 4 to 20, the product of 4 × 5, which they already learned. They could find the product for 9 × 4 or 4 × 9 by subtracting 4 from the product for 4 × 10. By the end of Dimensions Math® 2B, students learned all the 100 multiplication facts through 10 × 10 except for 16 of them (the ones where both factors are greater than 5). They will learn the remaining facts in Dimensions Math® 3B.

The first two lessons in this chapter review multiplication concepts from Dimensions Math® 2A. (The first one also introduces the second meaning for the symbol). This review is provided in case Dimensions Math® 3A is the first level your student is using, in which case they might not have learned any multiplication concepts yet. If it is new for your student, you will have to allow some additional time to help them become proficient with the multiplication facts for 2, 3, 4, 5, and 10 before proceeding to Lesson 3, which reviews division concepts.

In Dimensions Math® 1B, students were introduced to two division situations, sharing (partitive division) or grouping (quotative division). In Dimensions Math® 2A, they learned to write division equations for these situations.

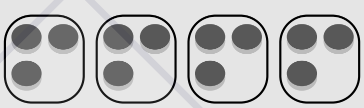
In a sharing situation, a given quantity is shared into a given number of groups equally to find the quantity in each group.



$12 \div 3 = 4$

12 shared into 3 groups is 4 in each group.

In a grouping situation, a given quantity is grouped by a given number to find the number of equal groups.



$12 \div 3 = 4$

12 grouped by 3 make 4 groups.

In each case, the equation is read as "twelve divided by three equals four." The answer is the same, even if the situation is different. If we are given only the expression $12 \div 3$, we do not know the physical situation it represents but it does not matter since the answer is the same. In Chapter 6, students will be learning how to use the division algorithm to find the value of an expression such as $75 \div 3$, which will be worked out with base-ten manipulatives as a sharing situation. They should understand that following this procedure will give the correct answer, even if the actual situation in the word problem is a grouping situation, without making groups of 3 and counting the total groups.

Lesson 3 is a thorough review of division concepts, in case this is new to students. If it is, you will again need to spend extra time helping your student become proficient with division facts for 2, 3, 4, 5, and 10 before Chapter 6.

Lesson 5 in this chapter will cover division with remainders. Often, a division with remainder problem is written as an "equation" with R; for example, $16 \div 3 = 5$ R 1. Using the = sign this way is technically incorrect. Compare the following:

$16 \div 3 = 5$ R 1 $\quad$ $21 \div 4 = 5$ R 1

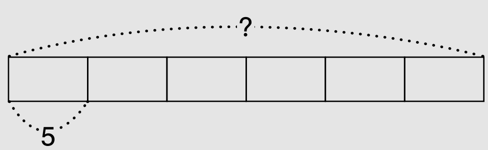
They both have the same "answer", which would imply that $16 \div 3 = 21 \div 4$. However, they are not equal:

$16 \div 3 = 5\frac{1}{3}$ $21 \div 4 = 5\frac{1}{4}$

In this curriculum, neither the term remainder nor R will be used in an equation. Instead, students will see “16 ÷ 3 is 5 with a remainder of 1” and can write “16 ÷ 3 is 5 R 1” as a shortcut for that statement. Students will learn to express an exact quotient as a mixed number in Dimensions Math® 4A.

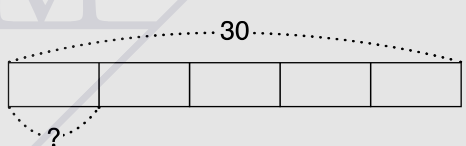
Part-whole bar models for multiplication and division were introduced briefly at the end of Chapter 7 of Dimensions Math® 2B. Students were not expected to draw them at that time. They will be introduced again in this chapter in Lesson 7, along with a new notation using arrows and the term “unit.” Students should know that all the units in a model drawn for multiplication or division problems are equal.

Part-whole model for multiplication:



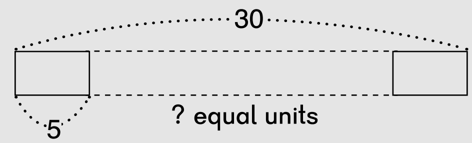
1 unit ⟶ 5
6 units ⟶ $5 \times 6 = 30$

Part-whole model for division (sharing):



5 units ⟶ 30
1 unit ⟶ $30 \div 5 = 6$

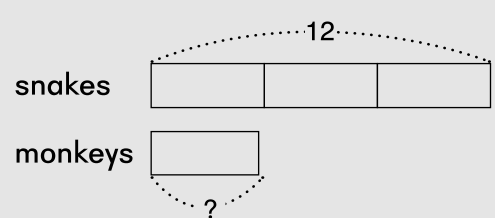
Part-whole model for division (grouping):



$30 \div 5 = 6$

The two units at the ends and the dotted lines indicate that all the units are equal, but we don’t yet know how many there are. A question mark by itself could be misinterpreted to mean that we need to find the difference between the total and two parts. Omit one or use “? equal units” instead. Using units and arrows is not as convenient for this type of model. Writing just a simple division equation is fine. Students will not often have to draw a model for grouping in order to know they need to divide.

Students will have word problems for multiplication and division involving comparison for the first time, and see and use comparison models. One simple example is, “Alex made 3 times as many pipe-cleaner snakes as monkeys. He made 12 snakes. How many monkeys did he make?”



3 units ⟶ 12
1 unit ⟶ $12 \div 3 = 4$

As with the bar models for addition and subtraction, the purpose for these models is to help students come up with a method of solution, particularly for word problems that require two or more steps to solve. They will learn to draw them even for simple one-step problems so that they become familiar with them and can use them with more complex problems. Later, they should not have to draw them for simple problems they can solve without a model. Bar models will be more useful with problems such as those in Lesson 9 that involve all four operations.

The examples in the textbook are static. Ideally, you should “model” drawing some of the models and discuss why you are drawing them the way you are. The only way to do this effectively is if you practice drawing some yourself. There is not a set of predetermined steps to follow in drawing bar models that you can apply to every situation. Trying to establish a set of steps, as if drawing models were an algorithm of some sort, will make them less useful for more complex word problems.

As with the bar models for addition and subtraction, student models do not have to be precise. These models are not graphs. They are not really the solution to the problem. They are simple sketches to help with arriving at a solution method, that is, what equations to use. The units do not have to look exactly the same length, as long as the student understands that they do represent equal units. They can be labeled in different ways than shown in the textbook, such as writing the number right inside the bar, if that is convenient. Nice dotted arcs are not required, just something that indicates exactly which part of the bar is labeled with that value. The bars need to be neat enough that the student can interpret them if they come back to them later. Using graph paper can help students draw neater bars.

Fact Practice

The more fluent your student is with the multiplication and division facts, the easier it will be for them to learn the multiplication and division algorithms, and the easier it will also be to estimate, which is essential for the division algorithm. For the multiplication algorithm in Dimensions Math® 3A, they only need to know all the facts that have 2, 3, 4, 5, or 10 as one of the factors. For the division algorithm, they only need to know the facts for division by 2, 3, 4, 5, and 10. If they do not yet know them, be sure to add in additional practice, either with the suggested activities and games in this guide, the **Mental Math Sheets**, or any computer game you can find online where you can designate which facts are included. In Dimensions Math® 3B, they will learn the remaining 16 facts that involve multiplication by 6, 7, 8, and 9.

Activity

- After Lesson 2
  Materials: Flash cards for the facts being practiced
  Purpose: Recall multiplication or division facts.
  Procedure: Mix the cards up. Show your student one card at a time and have them give the answer. If correct, place them in one pile; if wrong, place them in a second pile. Repeat with the second pile.

Games

- After Lesson 2
  Materials: Four sets of number cards 1–10 (or playing cards with faces removed), number cube for 1–5 and 10
  Purpose: Practice multiplication facts.
  Goal: Get the most cards.
  Procedure: Shuffle the cards and turn them face down in the middle. Each player draws a card, throws the die, and multiplies the number on the card with the number on the die. The player with the greatest product gets all the cards. If there are two players with the same greatest product, the one with the card with the greatest number gets all the cards. Alternately, those two players can draw another card and throw the die again to see which of them wins the round.

- After Lesson 3
  Materials: The number cards 1–50, 60, 70, 80, 90, and 100 (omit the numbers 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, and 47), number cube for 1–5 and 10.
  Purpose: Practice division facts.
  Goal: Get the most cards.
  Procedure: Shuffle the cards and turn them face down in the middle. Turn over five cards and place them in the middle. Each player takes turns throwing a number cube. If they can evenly divide the number on any of the face-up cards by the number rolled, they get the card. The next player turns over cards to replace any removed cards before throwing the die.

- After Lesson 5
  Materials: 50 counters, number cube labeled with 2, 3, 3, 4, 4, and 5
  Purpose: Divide when there is a remainder.
  Goal: Get the most counters.
  Procedure: Start with 50 counters in the middle. Players take turns throwing the number cube and dividing the counters in the middle by the number thrown. If there are any left over counters, they keep the left over counters. The rest of the counters are returned to the middle for the next player. For example, if there are 23 counters in the middle and a player rolls a 3, they will keep 2 counters, and 21 counters are returned to the middle. Play continues until there are no counters left (when a player rolls a number greater than the number of counters, they keep all of the counters).

Lesson 9 2-Step Word Problems (pp. 128–131)

You may want to spend an extra day on this lesson to make sure your student understands the examples and has plenty of time to think through the workbook problems.

Think (p. 128)

Have your student read the problem, draw a model (without seeing Learn), and solve the problem. Their model does not have to look just like the one in Learn. For example, they could draw one bar to start with for the amount cut off and the amount left, and then simply divide the part representing the cut piece into 4 equal units, one of which is the first piece. Or, they could draw a second model just for the two pieces that were cut off. If they do struggle with any model at all, suggest that they start with the sentence that says that the second piece is 3 times as long as the first, and then add a third bar for the part still on the spool. However they draw their model, they will not know in advance how long the bar representing the third piece should be relative to the other two pieces, but it is not necessary to know that in order to see how to solve the problem.

Learn (p. 128)

This shows one way a model could be drawn. Although students could estimate to see that the length for what is left on the spool will be longer than the parts that were cut off (30 – 20 = 10, the other two pieces

Answers

3
9
9

1 (a) 4 units ⟶ 4 × **4** = **16** 16
(b) 2 units ⟶ 2 × **4** = **8** 8

2 6 units ⟶ 6 × **5** = **30**
30 + 12 = 42
42

3 1 unit ⟶ 18 ÷ 2 = **9**
9

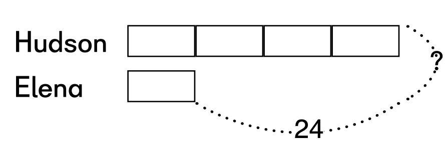
4 1 unit ⟶ 4 + 2 = 6
3 units ⟶ 3 × 6 = 18
18 brushes

5 5 units ⟶ 23 + 17 = 40
1 unit ⟶ 40 ÷ 5 = 8
8 rocks

6 2 units ⟶ 11 + 3 = 14
1 unit ⟶ 14 ÷ 2 = 7
7 turtles

7 9 × 4 = 36
36 ÷ 6 = 6
6 vases

8 Number of packs: 20 ÷ 5 = 4
Total cost: 4 × 3 = $12
$12

9


1 unit ⟶ 24 ÷ 3 = 8
5 units ⟶ 5 × 8 = 40
40 crayons

are together about 10 m), to do so means the student already knows the first step, and so would not even need to draw a bar for the piece still on the spool.

Point out what Sofia is saying, which is important, particularly for more complex problems. It is a good idea to substitute in the answer and see if it makes sense. The three pieces do have to add to 30, and if they don't, the problem needs to be reworked.

Do (pp. 129–131)

The examples shown are only possible models. Alternate models are possible for some of them.

❶ Students will learn that many of these problems will involve first finding the value of 1 unit, if that is not given.

❷ This model is a part-whole model for addition and subtraction, with one of the parts a part-whole model for multiplication and division. The part for the knitting needles could also have been drawn as a separate bar.

❸ This problem would be challenging if students were not given this example, since there are no equal units to begin with. Since we want to find how many dinosaurs Emma made, we make her bar the unit, and then create equal units by subtracting the difference. Students will see similar problems later, as well as problems that build on the ideas in this problem, so make sure your student understands the solution. In this case in particular, it is helpful to use arrow sentences.

❹ ❺ Students could probably solve both of these problems without a model.

❻ This problem is similar to ❸. Because we want to find how many turtles Mei made, we can make her bar the unit and then add 3 to have two equal units. This type of problem does require a model to solve at this level.

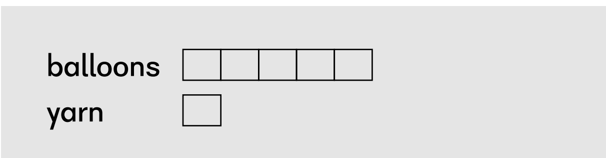
❼ We could draw two bars for the tulips and daisies, and not really need the bar for the vases.

❽ Students can probably solve this problem without a model, and drawing a grouping type of model to show that they need to divide means they already know they need to divide. They do not have to be required to draw a model when they do not need to.

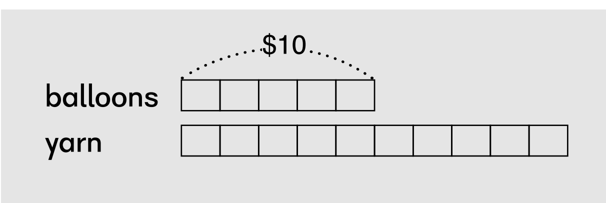
❾ Students will need to draw a model to solve this problem at this level. They should get into the habit of drawing one when they cannot see a method of solution right away.

Lesson 10 Practice (pp. 132–134)

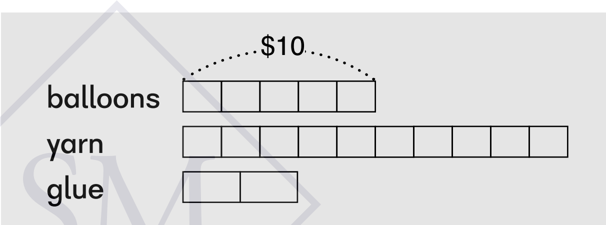
5 A model is provided, but to help your student understand the model and how it relates to the word problem, you may want to show them the steps that would be used in drawing it, or have them draw parts of it as they solve the problem. Tell them to look for a statement that lets them draw units first. Start with the statement that the balloons cost 5 times as much as 1 skein of yarn. The unit is the cost of 1 skein of yarn.



Then, read the problem again to see what can be added to the model. The balloons cost $10, and she bought 10 skeins of yarn.



The 2 bottles of glue cost the same as 3 skeins of yarn.



Alternately, have your student draw a model for each part of the problem. To solve (a), they would draw the first model above; to

Answers

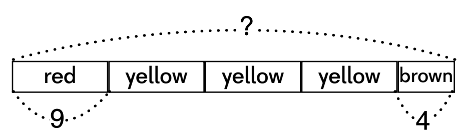
1 (a) 2 (b) 28 (c) 7
(d) 16 (e) 8 (f) 0
(g) 7 (h) 9 (i) 6
(j) 8 (k) 1 (l) 0

2 (a) 4 (b) 0 (c) 24
(d) 1 (e) 0 (f) 2

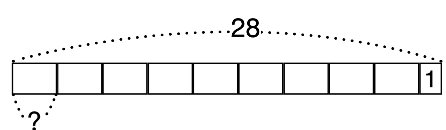
3 (a) 3 R 1 (b) 3 R 1 (c) 5 R 2
(d) 3 R 1 (e) 4 R 2 (f) 8 R 8
(g) 8 R 2 (h) 6 R 2 (i) 5 R 1

4 (a) even (b) odd
(c) odd (d) even

5 (a) $10 \div 5 = 2$
$2
(b) $10 \times 2 = 20$
$20
(c) $3 \times 2 = 6$ (cost of 2 bottles of glue)
$6 \div 2 = 3$
$3
(d) $10 + 20 + 6 = 36$
36
(e)



$9 \times 4 = 36$ (non-brown balls)
$36 + 4 = 40$ (total balls)
$40 \div 5 = 8$
8 bowls
(f)



$28 - 1 = 27$
$27 \div 9 = 3$
$3

solve (b), they could add to that model to get the second one above; to solve (c), they could add the bar for the glue.

Your student probably will not need to draw models for (e) and (f). You may have to explain what a tip is.

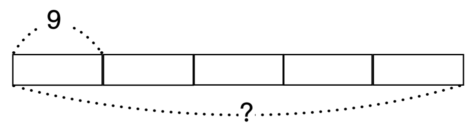
❻ You may have to explain to your student that the profit is the amount he made after subtracting all the costs. They probably do not need to draw a bar model for this problem, even though (b) is a two-step problem; they simply need to find the total cost.

❼ This problem is a type of problem where a bar model is needed. It builds on the ideas in ❸ and ❻ of the previous lesson. It does include more than two steps in the solution. Make sure your student understands the problem. They need to find the value of 1 unit, which is how many pine cones Arman collected. In these more challenging problems, the first step is often to find the value of several units. From the model, they should be able to see that if they take away 6, they will have 3 equal units.

❽ This problem is very similar to the previous problem and can be solved with the same set of steps, so your student may be able to draw a model and solve it on their own.

Answers (continued)

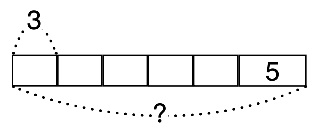
❻ (a)



5 × 9 = 45

$45

(b)



5 × 3 = 15

15 + 5 = 20

$20

(c) 45 − 20 = 25

$25

❼ (a) 3 × 2 = 6

4 units ⟶ 30 − 6 = 24

1 unit ⟶ 24 ÷ 4 = 6

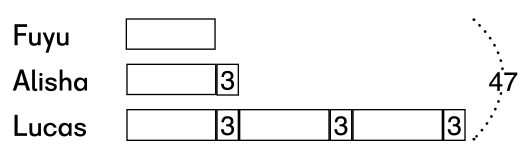
6 pine cones

(b) 6 + 2 = 8

2 × 8 = 16

16 pine cones

❽



(a) 4 × 3 = 12

5 units ⟶ 47 − 12 = 35

1 unit ⟶ 35 ÷ 5 = 7

7 pine cones

(b) 7 + 3 = 10

3 × 10 = 30

30 pine cones

Review 1 (pp. 135–138)

1 Students may be able to solve (e) and (f) mentally, as well as (d).

4 Students may be able to solve the first two without evaluating each side. In (a), there are hundreds on the left side, but not the right side. In (b), 3,000 is less than 8,000.

9 Student models may vary from the one shown in the answers here. Problem (a) is straightforward and students have done problems like it without a model. Problem (b) is simply part-whole with 3 parts. A model, though, may help students keep track of what values they are finding.

13 This problem may be challenging for some students but is similar to the last two problems in Lesson 10. If your student struggles, remind them that they need to think of a way to find the value of 1 unit. They can draw 3 units for Fatima and 1 for Hannah, and then cross out part of Fatima's bar to show the 3 bracelets that are lost. They don't know if it is more than a unit or less, but that does not affect the method of solution. Then they should indicate that the remaining 2 bars is 17 in all. Suggest that they try to make equal units. If Fatima lost 3 bracelets, she would have 3 times as many as Hannah again if she found them, and if she did find them, the total number of bracelets would be 20, which would be the value of 4 units.

Answers

1
(a) 2
(b) 800
(c) tens
(d) 2,846 – 1,000 = 1,846
(e) 2,846 + 900 = 3,746
(f) 2,846 – 60 = 2,786

2
(a) 3,899
(b) 3,899 3,914 4,086 4,189
(c) 3,899 + 4,189 = 8,088
(d) 4,189 – 3,899 = 290

3
(a) 4,550
(b) 4,500
(c) 5,000

4
(a) > 5,585 > 5,090
(b) < 3,648 < 8,408
(c) = 2,100 = 2,100
(d) = 9,500 = 9,500

5
(a) 90 (b) 50
(c) 640 (d) 575
(e) 8 (f) 520
(g) 3 (h) 4
(i) 9 (j) 2
(k) 0 (l) 6

6 Estimates can vary. Actual answers:
(a) 4,150 (b) 4,797
(c) 5,421 (d) 5,000

7
(a) 4 R 1 (b) 6 R 1 (c) 7 R 2
(d) 9 R 3 (e) 9 R 4 (f) 3 R 1

8
(a) 5,807 – 3,326 = 2,481
2,481 more girls than boys
(b) 3,326 + 5,807 = 9,133
9,133 children

14 This problem can likely be solved without a model; by now students might be able to imagine a model of 4 units, but can draw one if needed. 2 bags are used, 2 bags are left, so half the sticks of clay are left. If students don't realize this and draw a model and solve step by step, they might use two or three steps. For example, they might first find the number in each bag (24 ÷ 4 = 6), then the number in two bags (2 × 6 = 12).

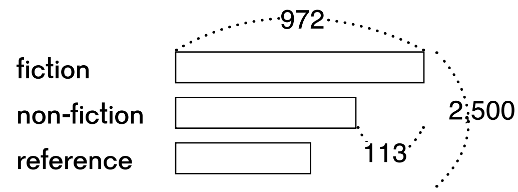
15 Students can solve this either by thinking of all the multiplication facts that make 12, or trying to divide 12 by 2, 3, 4, 5 and so on to see if there is a remainder:

12 ÷ 2 = 6   2 teams of 6 children
12 ÷ 3 = 4   3 teams of 4 children
12 ÷ 4 = 2   4 teams of 3 children
12 ÷ 6 = 2   6 teams of 2 children

If this is challenging, let them use 12 counters.

Answers (continued)

9

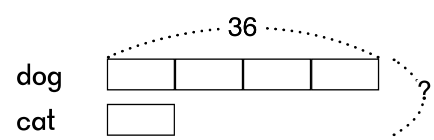


(a) 972 – 113 = 689
589 non-fiction books

(b) 2,500 – 972 – 859 = 699
699 reference books

10 47 ÷ 5 is 9 R 2
2 flowers

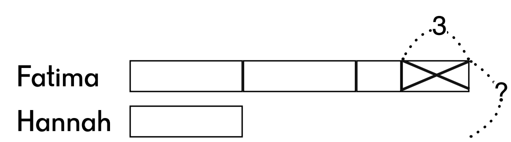
11



1 unit ⟶ 36 ÷ 4 = 9
5 unit ⟶ 5 × 9 = 45
Or: 36 + 9 = 45
45 lb

12 23 ÷ 3 is 9 R 1
9 airplanes

13

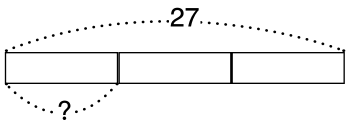


4 units ⟶ 17 + 3 = 20
1 unit ⟶ 20 ÷ 4 = 5
5 bracelets

14 24 ÷ 2 = 12
12 sticks

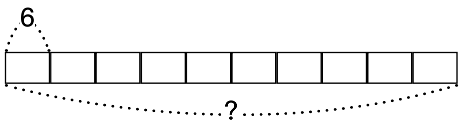
15 4 different ways

(c)



27 ÷ 3 = 9
$9

(d)



10 × 6 = 60
60 ft

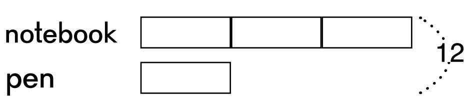
Exercise 8 pp. 116–118

1. **A** 4 units ⟶ 7 × **4** = **28**
   B 5 units ⟶ 7 × **5** = **35**
   C 3 units ⟶ 7 × **3** = **21**

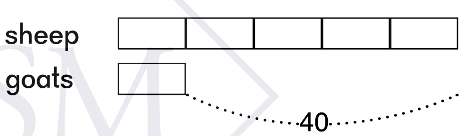
   D 1 unit ⟶ 24 ÷ **4** = **6**

2. **A** 50 ÷ **5** = **10**

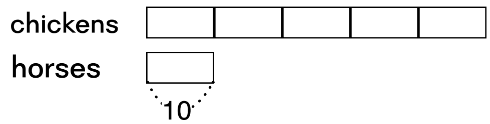
   B 9 ÷ **3** = **3**

3. 

   (a) 12 ÷ 4 = 3
   $3
   (b) 3 × 3 = 9
   $9

4. 

   (a) 40 ÷ 4 = 10
   10 goats
   (b) 5 × 10 = 50
   50 sheep

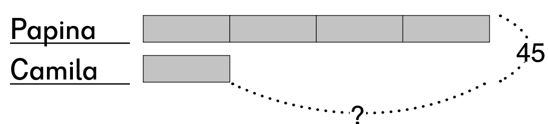
5. 

   (a) 5 × 10 = 50
   50 chickens
   (b) 4 × 10 = 40 or: 50 − 10 = 40
   40 more chickens than horses

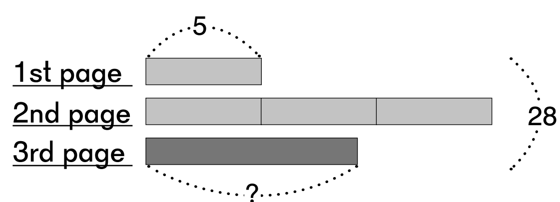
Exercise 9 pp. 119–122

1. **A** 4 units ⟶ 44 − **8** = **36**
   1 unit ⟶ **36** ÷ **4** = **9**
   B 3 units ⟶ **9** × 3 = **27**

   C 5 units ⟶ 50 − **30** = **20**
   1 unit ⟶ **20** ÷ **5** = **4**
   D 2 units ⟶ **4** × 2 = **8**
   30 + **8** = **38**

2. 

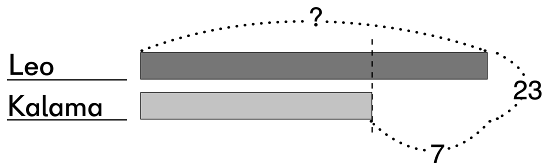
   5 units ⟶ 45 ÷ 5 = 9
   3 units ⟶ 3 × 9 = 27
   27 more seashells

3. 

   4 units ⟶ 4 × 5 = 20
   28 − 20 = 8
   8 pictures

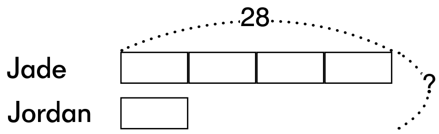
Chapter 4 Workbook Answers

4



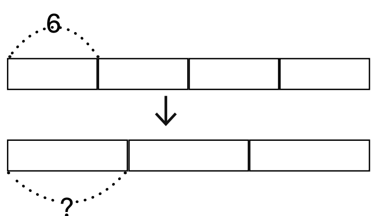
2 units ⟶ 23 + 7 = 30
1 unit ⟶ 30 ÷ 2 = 15
15 stickers

5



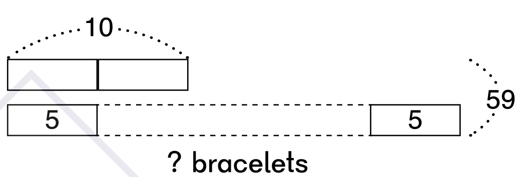
4 units ⟶ 28 ÷ 4 = 7
5 units ⟶ 5 × 7 = 35
(or: 28 + 7 = 35)

6



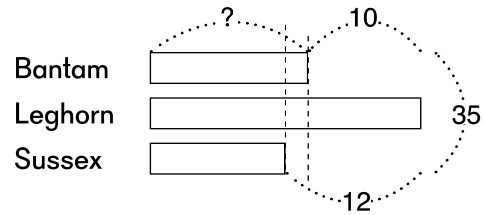
4 × 6 = 24
24 ÷ 3 = 8
8 cars

7



59 − 10 = 49
49 ÷ 5 is 9 R 4
9 bracelets

8



12 − 10 = 2
3 units ⟶ 35 − 10 + 2 = 27
1 unit ⟶ 27 ÷ 3 = 9
9 Bantam chickens

Check:
Leghorn: 9 + 10 = 19
Sussex: 19 − 12 = 7
9 + 19 + 7 = 35 ✓

This problem is a variation of the type of problem in **4**. We can have the same number of Leghorn and of Sussex as Bantam chickens if we remove 10 Leghorn chickens and add 2 Sussex chickens, giving 3 units of Bantam chickens. A bar model makes this type of problem possible to solve at this level. Encourage your student to check their answers, particularly for challenging problems.

Exercise 10 pp. 123–126

1
(a) 21
(b) 0
(c) 8 R 3

2
(a) 3
(b) 15
(c) 8
(d) 4

Lesson 4 Multiplication with Regrouping Ones (pp. 152–155)

This is the first lesson in which students will need to regroup the ones and multiply the digit in the tens place. Spend as much time as needed. Even if your student is good at mental math, have them do a few problems using the standard algorithm so they will be able to use it easily with three-digit numbers in Lessons 7 and 8.

Study pages 152–153 in advance so you know how the discs are used.

Write the expression 24 × 4 vertically. Give your student place-value discs and a place-value chart. Draw a horizontal line near the top of the chart. Have them show 24 with the discs, and then ask them show the 4 ones multiplied by 4. There will be 16 ones, so they will trade in 10 ones for a ten. Tell them that they should not put the regrouped ten with the other tens right away, since it is already a product; instead, they can put it at the top above the line. Show them how you write this on the written problem.

$$\begin{array}{r} {\scriptstyle 1} \\ 2\,4 \\ \times \quad 4 \\ \hline 6 \end{array}$$

Then have your student multiply the 2 tens by 4. There are 8 tens in the main part of the chart. The total number of tens is 9. Show them where you will write that in the written problem.

Answers

72

72

❶ 2

70

20

50

70

❷ 2

84

❸ 1

98

❹ (a)

$$\begin{array}{r} \boxed{3} \\ \boxed{1}\,8 \\ \times \quad 4 \\ \hline 7\,2 \end{array}$$

(b)

$$\begin{array}{r} \boxed{1} \\ 3\,5 \\ \times \quad \boxed{2} \\ \hline 7\,0 \end{array}$$

❺ (a) 85 (b) 76 (c) 75

(d) 96 (e) 90 (f) 95

❻ 18 × 3 = 54

54 raffle prizes

$$\begin{array}{r} {\scriptstyle 1} \\ 2\,4 \\ \times \quad 4 \\ \hline 9\,6 \end{array}$$

Make sure they understand why they do not multiply all 3 tens by 4. If necessary, you can show that with the partial products.

$24 \times 4 = 80 + 16 = 96$

20 4

If they multiplied the 3 tens by 4, they would end up with 12 tens, and it would seem the answer is 126, which is incorrect.

Think and Learn (pp. 152–153)

Have your student read the problem and write an expression. Discuss the steps shown in Learn. You can use actual discs, if needed. The last step shows the shortcut method of writing the answer, and Emma verifies that it is the sum of the partial products.

Sofia explains that she can solve the problem mentally, multiplying the tens first. Do not require your student to solve two-digit multiplication problems mentally. This is just an option. It is more important at this stage that they fully understand the written algorithm.

Do (pp. 154–155)

❶ ❷ ❸ Students may be able to decipher the pictures of the discs, but if your student is struggling, have them use discs. In the first two problems, 20 ones are regrouped.

❹ These may be a little more challenging than similar problems in the previous lesson, since there is regrouping. In (a), students need to think what number, multiplied by 4, will be 7 when 3 is added to it. In (b), they have to think of what number 5 can be multiplied by to get a product with 0 in the ones place. Although it could be any even number, any number greater than 2 will not work to give 7 in the tens place. Problems like these will deepen your student's understanding of the algorithm so that they do not simply follow steps by rote.

❺ Students can solve these mentally if they want, but do not require it. They can use discs if needed. (Problem (e) is 7 × 15 in earlier printings of the textbook. Change it to 6 × 15 since renaming twice is the next lesson.)