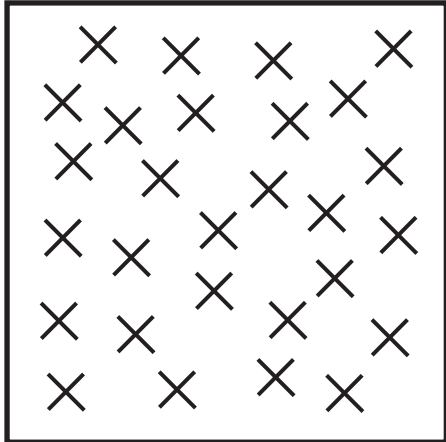


1

About how many **X**'s are there in the square?



ANSWER: Sample: There are about 30 X's.

COMMENTS & EXTENSIONS: Some students will be tempted to count, especially since the X's are not ordered in rows and columns as most number activities are. They should, however, find other tactics to give them a quick yet accurate estimation instead of a time-consuming, exact count.

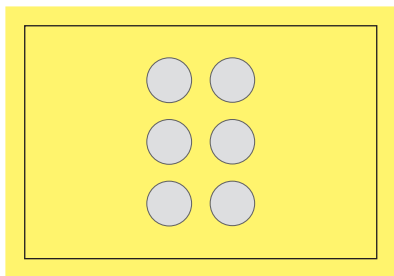


Explain your estimation method. How did you make certain that your guess was close to the actual quantity?

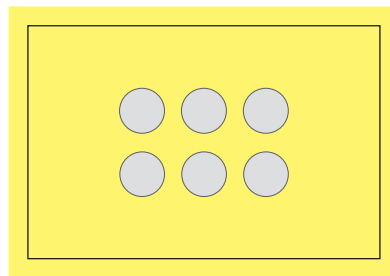
Try This

- Use Two-Color Counters to build an array for the problem.
- Draw your array in the first box and write the product.
- Use the commutative property to build a different array.
- Draw the array in the second box and write the multiplication sentence.

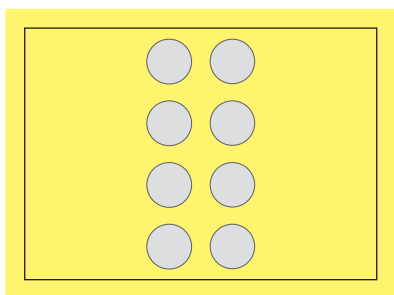
1. $3 \times 2 = \underline{6}$



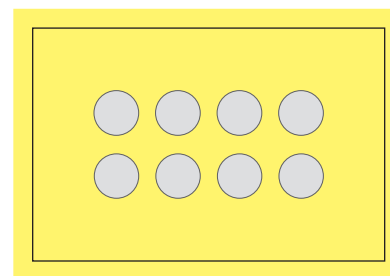
$2 \times 3 = \underline{6}$



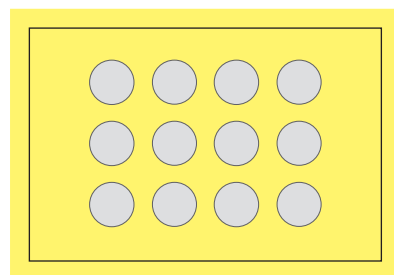
2. $4 \times 2 = \underline{8}$



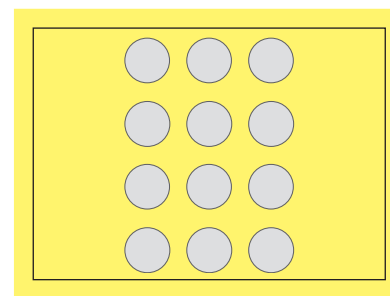
$\underline{2} \times \underline{4} = \underline{8}$



3. $3 \times 4 = \underline{12}$



$\underline{4} \times \underline{3} = \underline{12}$



Write a multiplication sentence to solve the problem. Use the commutative property to write a different number sentence. Complete the description of the new situation that goes with the new number sentence.

- 4.** Your teacher has 4 new boxes of crayons. If each box has 6 crayons, how many crayons does she have?

$$\underline{4} \times \underline{6} = \underline{24}$$

$$\underline{6} \times \underline{4} = \underline{24}$$

6 boxes

4 crayons in each box

24 crayons in all

- 5.** You ate 3 meals every day on your vacation. If your vacation was 7 days, how many meals did you eat?

$$\underline{7} \times \underline{3} = \underline{21}$$

$$\underline{3} \times \underline{7} = \underline{21}$$

3 days

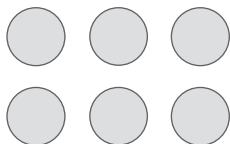
7 meals each day

21 meals in all

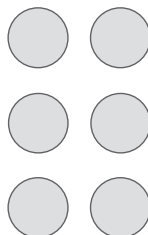
Use Two-Color Counters to build the models.

Use the models to complete the number sentences.

1. $2 \times 3 =$ 6

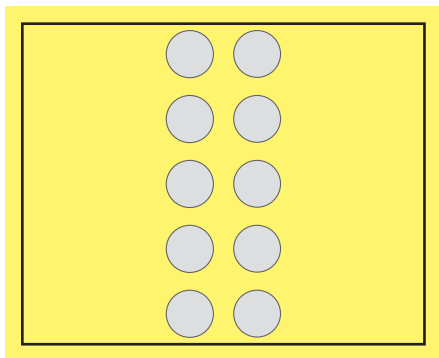


$3 \times 2 =$ 6

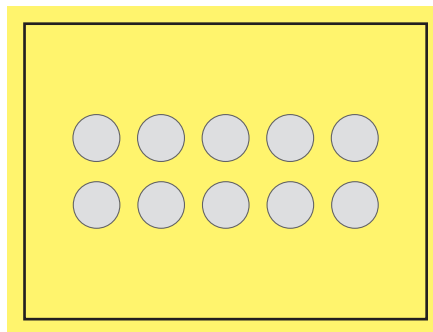


Use Two-Color Counters to build an array for the problem. Draw your array in the first box and write the product. Use the commutative property to build a different array. Draw the array in the second box and write the multiplication sentence.

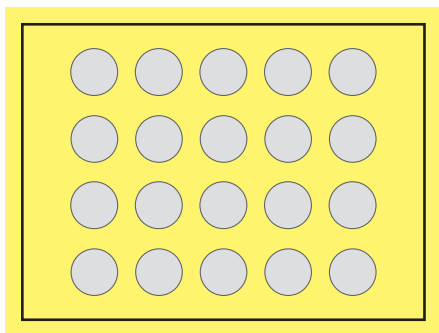
2. $5 \times 2 =$ 10



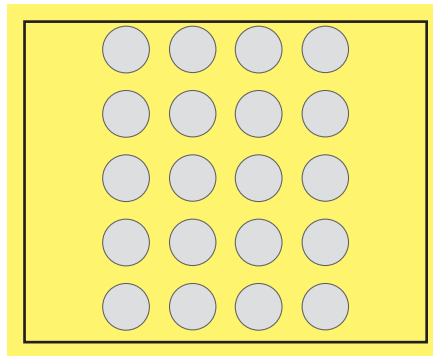
$2 \times 5 =$ 10



3. $4 \times 5 =$ 20



5 $\times$ 4 $=$ 20



Write a multiplication sentence to solve the problem. Use the commutative property to write a different number sentence. Complete the description of the new situation that goes with the new number sentence.

4. You have 2 packs of gum. Each pack has 7 pieces. How many pieces of gum do you have?

$$\underline{2} \times \underline{7} = \underline{14}$$

$$\underline{7} \times \underline{2} = \underline{14}$$

7 packs

2 pieces in each pack

14 pieces in all

5. For 6 months, you read 3 books every month. How many books did you read in all?

$$\underline{6} \times \underline{3} = \underline{18}$$

$$\underline{3} \times \underline{6} = \underline{18}$$

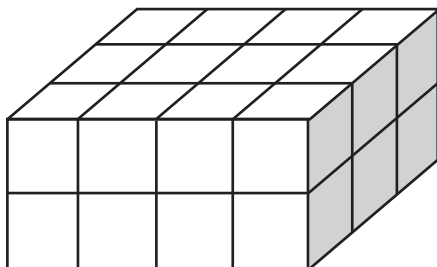
3 months

6 books in each month

18 books in all

2

a. How many small cubes are there?



b. The figure shown is a $3 \times 2 \times 4$. How many small cubes are in a $2 \times 4 \times 5$ figure?

ANSWER: a. 24 small cubes; b. 40 small cubes

COMMENTS & EXTENSIONS: Some students may need the actual blocks. Some others may be able to work from the drawing. Still others may be able to work with a purely symbolic representation (" $2 \times 4 \times 5$ ").

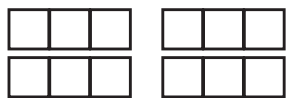
Try This

You have 2 lunch packs of carrot sticks. Each lunch pack contains 2 bags with 3 carrot sticks in each bag. How many carrot sticks do you have?

- Use Color Tiles to build two different models for the problem.
- Draw your models.
- Write a number sentence for each model.

$$2 \times 2 \times 3 = ?$$

2 lunch packs of 2 bags,
So 4 bags of 3 carrot sticks.



$$(2 \times 2) \times 3 = 4 \times 3 = 12$$

2 bags of 3 carrot sticks,

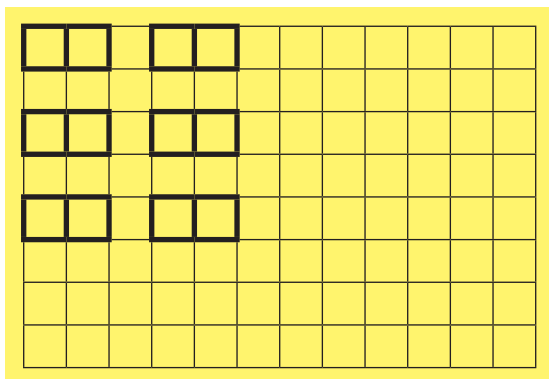
So 2 lunch packs of 6 carrot sticks.



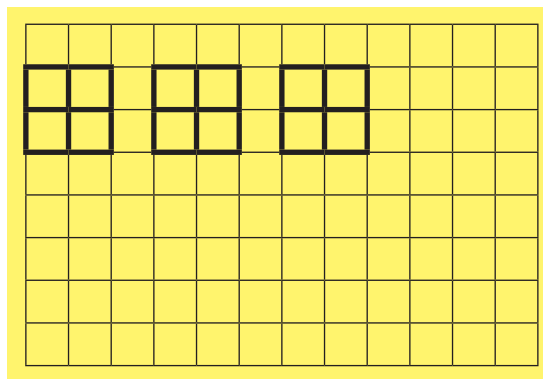
$$2 \times (2 \times 3) = 2 \times 6 = 12$$

1. $3 \times 2 \times 2 = ?$

Answers may vary. Sample answers are given.

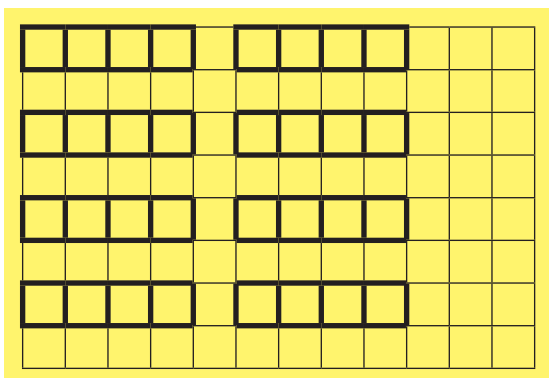


$$6 \times 2 = 12$$

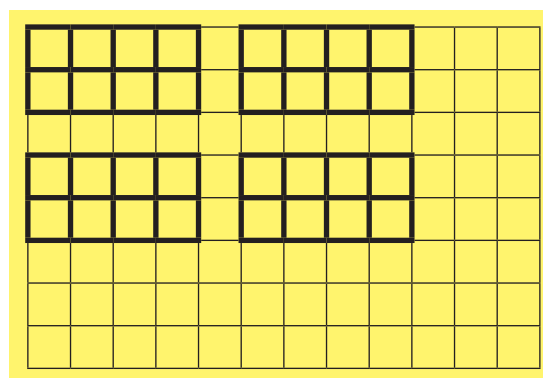


$$3 \times 4 = 12$$

2. $4 \times 2 \times 4 = ?$



$$8 \times 4 = 32$$

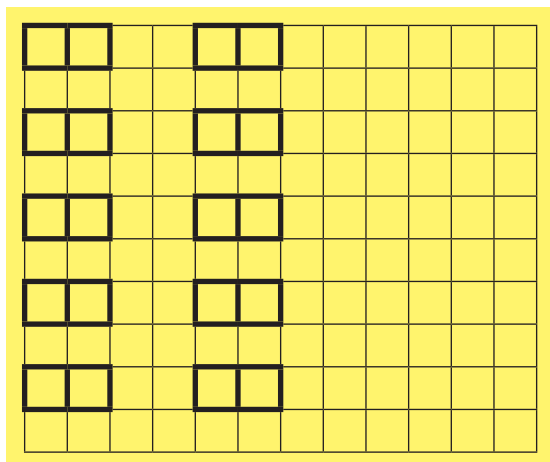


$$4 \times 8 = 32$$

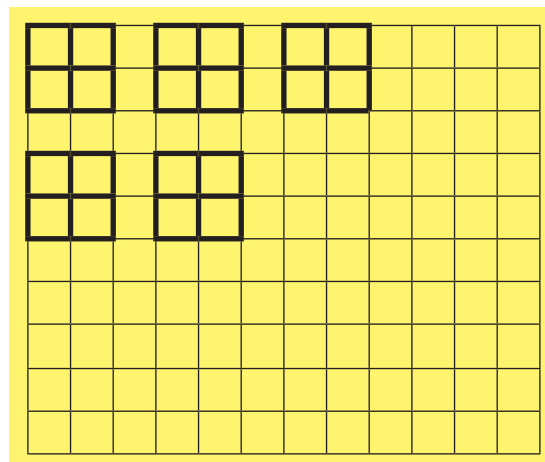
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3. $5 \times 2 \times 2 = ?$



10 $\times$ 2 = 20



5 $\times$ 4 = 20

Rewrite the expression two ways.

4. $4 \times 4 \times 2 = \underline{16} \times \underline{2}$
 $= \underline{4} \times \underline{8}$

5. $3 \times 4 \times 2 = \underline{12} \times \underline{2}$
 $= \underline{3} \times \underline{8}$

Write an expression for the situation. Use parentheses.

6. Your teacher has 2 cases of pencils. Each case has 4 boxes of 6 pencils. How many pencils does your teacher have? Find the number of pencils in each case first.

$2 \times (4 \times 6)$ or 2×24

Write a situation for the expression.

7. $(3 \times 2) \times 5$

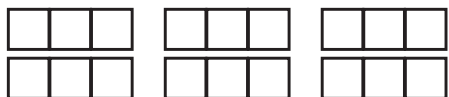
Answers will vary.

Use Color Tiles to build the model.

Use the model to complete the number sentence.

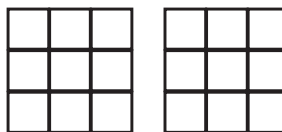
1. $(2 \times 3) \times 3$

6 $\times 3 =$ 18



2. $2 \times (3 \times 3)$

$2 \times$ 9 $=$ 18

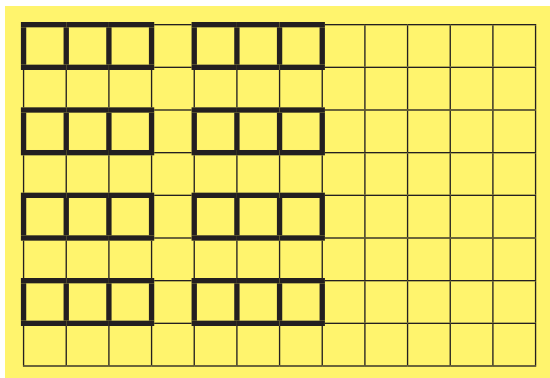


Use Color Tiles to build two different models for the problem.

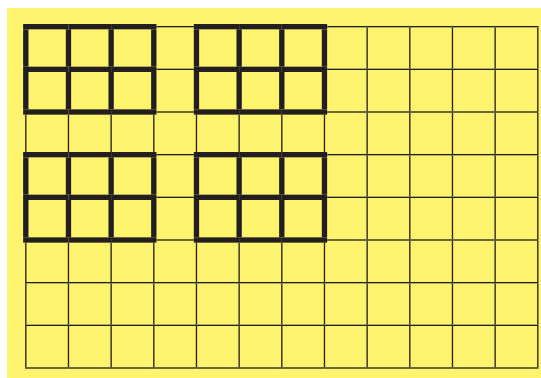
Draw each model, and use it to write a number sentence.

3. $4 \times 2 \times 3 = ?$

Answers may vary. Sample answers are given.

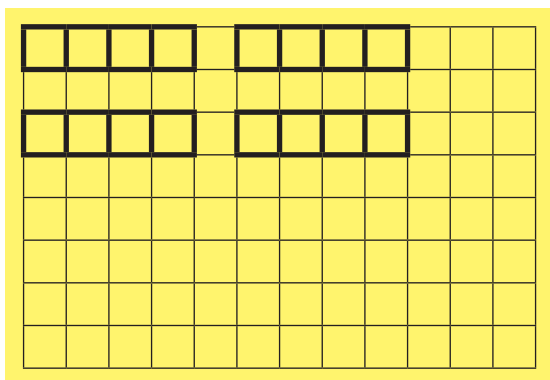


$8 \times 3 = 24$

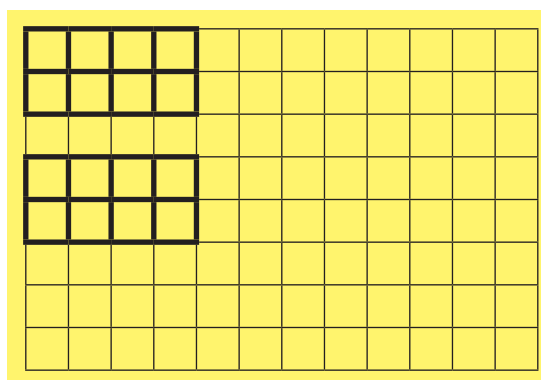


$4 \times 6 =$ 24

4. $2 \times 2 \times 4 = ?$

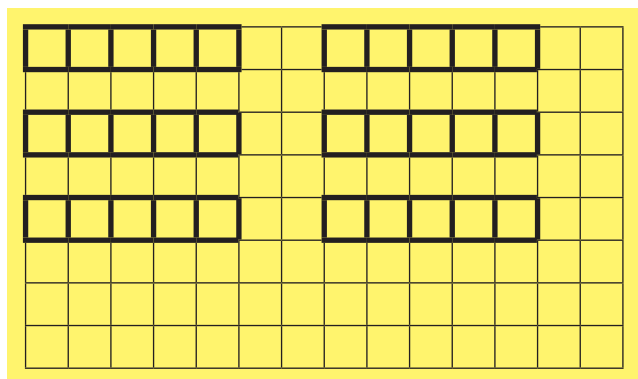


4 $\times$ 4 $=$ 16

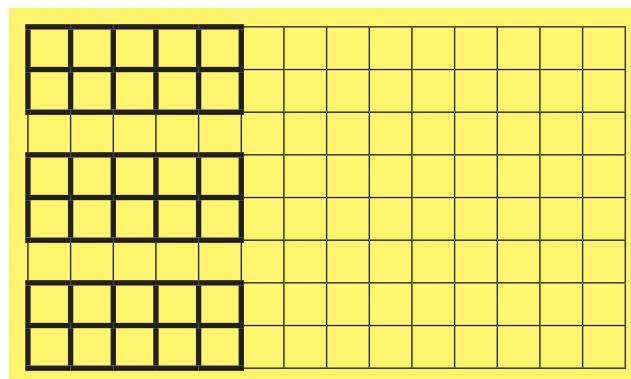


2 $\times$ 8 $=$ 16

5. $3 \times 2 \times 5 = ?$



$$\underline{6} \times \underline{5} = \underline{30}$$



$$\underline{3} \times \underline{10} = \underline{30}$$

Rewrite the expression two ways.

$$\begin{aligned} 6. \quad 2 \times 2 \times 5 &= \underline{4} \times \underline{5} \\ &= \underline{2} \times \underline{10} \end{aligned}$$

$$\begin{aligned} 7. \quad 2 \times 4 \times 4 &= \underline{8} \times \underline{4} \\ &= \underline{2} \times \underline{16} \end{aligned}$$

3

Complete each addition table.

a.

+		
3	11	13
4		

b.

+	2	
		5
5	7	9

c.

+	3	9
	5	
	8	

ANSWER: a.

+	8	10
3	11	13
4	12	14

b.

+	2	4
1	3	5
5	7	9

c.

+	3	9
2	5	11
5	8	14

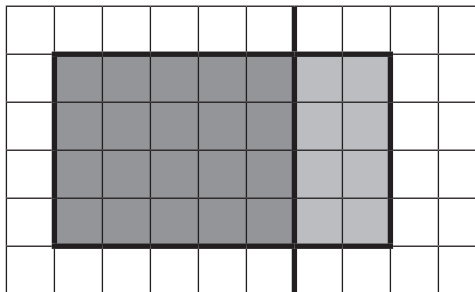
COMMENTS & EXTENSIONS: Make up more grid problems like this for students to complete. Start with a completed grid (no blanks) and blank out some of the numbers. Be sure to solve the grid problems yourself.

Try This

Andrea has 4 boxes of pencils. Each box contains 7 pencils. How many pencils are there in all? Show how to make an easier problem.

- Use Color Tiles to build an array for the problem.
- Draw your array on the grid.
- Show the parts by drawing a line.
- Complete the number sentences.

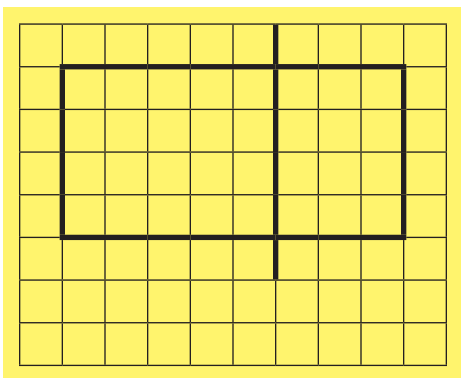
$$4 \times 7 = 4 \times (5 + 2) = 28$$



$$(4 \times 5) + (4 \times 2) = 20 + 8$$

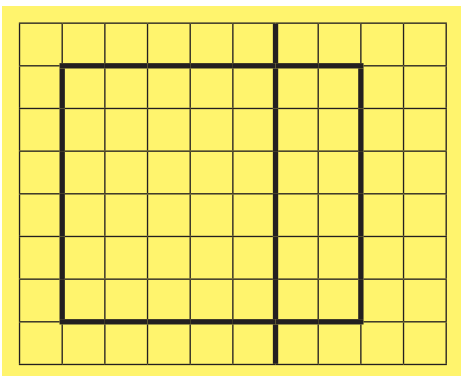
Answers will vary. Sample answers are given.

1. $4 \times 8 = 4 \times (\underline{5} + \underline{3}) = \underline{32}$



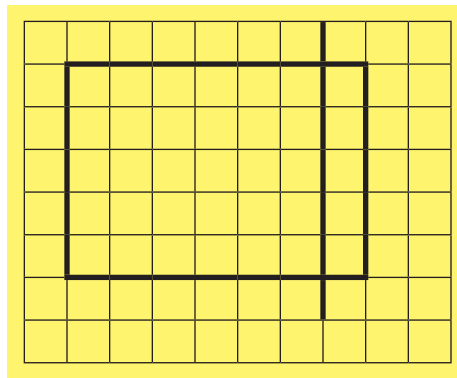
$$(\underline{4} \times \underline{5}) + (\underline{4} \times \underline{3}) = \underline{20} + \underline{12}$$

3. $6 \times 7 = 6 \times (\underline{5} + \underline{2}) = \underline{42}$



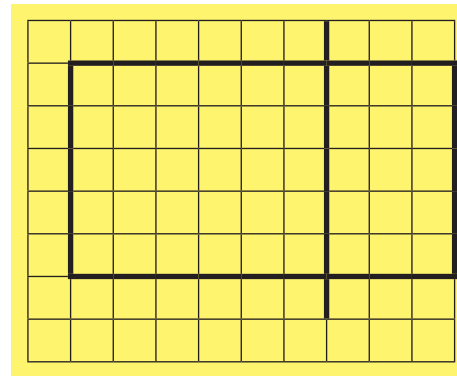
$$(\underline{6} \times \underline{5}) + (\underline{6} \times \underline{2}) = \underline{30} + \underline{12}$$

2. $5 \times 7 = 5 \times (\underline{6} + \underline{1}) = \underline{35}$



$$(\underline{5} \times \underline{6}) + (\underline{5} \times \underline{1}) = \underline{30} + \underline{5}$$

4. $5 \times 9 = 5 \times (\underline{6} + \underline{3}) = \underline{45}$



$$(\underline{5} \times \underline{6}) + (\underline{5} \times \underline{3}) = \underline{30} + \underline{15}$$

continued on the next page

Complete the number sentence.

5. $6 \times (5 + 4) = (6 \times 5) + (6 \times 4)$

6. $8 \times (5 + 1) = (8 \times 5) + (8 \times 1)$

7. $5 \times (5 + 5) = (5 \times 5) + (5 \times 5)$

8. $6 \times (5 + 3) = (6 \times 5) + (6 \times 3)$

Solve the problem.

9. Roberta solved 8 math problems every day for 7 days. How many problems did she solve in all?

$$\begin{aligned} 7 \times 8 &= 7 \times (5 + 3) \\ &= (7 \times 5) + (7 \times 3) \\ &= 35 + 21 \\ &= 56 \end{aligned}$$

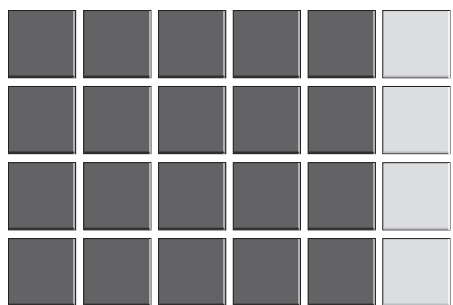
10. The library has 4 rows of tables. There are 9 tables in each row. How many tables are there?

$$\begin{aligned} 4 \times 9 &= 4 \times (5 + 4) \\ &= (4 \times 5) + (4 \times 4) \\ &= 20 + 16 \\ &= 36 \end{aligned}$$

Use Color Tiles to build the model. Write the missing numbers.

1. You had 4 rows of 5 chairs. Then you added a chair to each row. How many chairs do you have now?

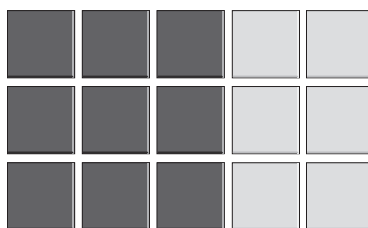
$$4 \times (5 + 1) = ?$$



$$(4 \times 5) + (4 \times 1) = \underline{20} + \underline{4} = \underline{24}$$

2. You had 3 groups of 3 books. Then you added 2 books to each group. How many books do you have now?

$$3 \times (3 + 2) = ?$$

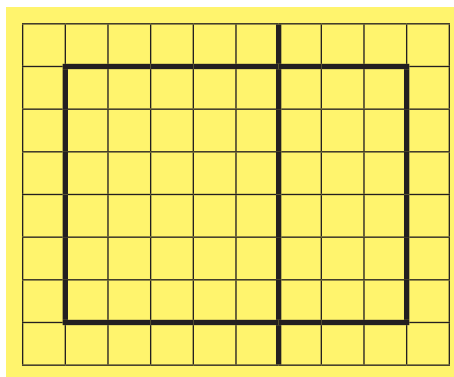


$$(\underline{3} \times \underline{3}) + (\underline{3} \times \underline{2}) = \underline{9} + \underline{6} = \underline{15}$$

Use Color Tiles to model the problem. Draw your model on the grid. Write the missing numbers.

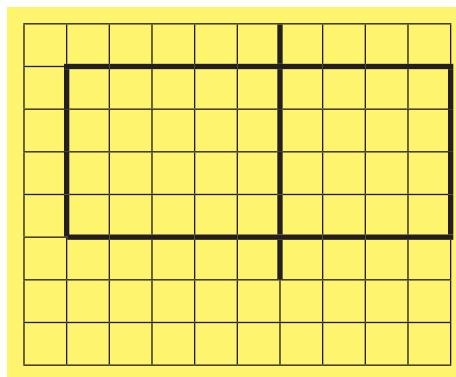
Answers may vary.

3. $6 \times 8 = 6 \times (5 + \underline{3})$



$$(\underline{6} \times \underline{5}) + (\underline{6} \times \underline{3}) = \underline{30} + \underline{18} = \underline{48}$$

4. $4 \times 9 = 4 \times (\underline{5} + \underline{4})$



$$(\underline{4} \times \underline{5}) + (\underline{4} \times \underline{4}) = \underline{20} + \underline{16} = \underline{36}$$

Complete the number sentence.

5. $3 \times (5 + 1)$
 $= (\underline{3} \times \underline{5}) + (\underline{3} \times \underline{1})$

6. $8 \times (5 + 3)$
 $= (\underline{8} \times \underline{5}) + (\underline{8} \times \underline{3})$

7. $\underline{5} \times (4 + 1) = (5 \times 4) + (5 \times 1)$

8. $\underline{6} \times (5 + 4) = (6 \times 5) + (6 \times 4)$

4

Here are 3 number cards.



Use them all to make

- a. the biggest number.
- b. the smallest 3-digit number.
- c. the number closest to 500.

ANSWER: a. 741; b. 147; c. 471

COMMENTS & EXTENSIONS: A twist on the original activity: Use the same questions, but this time you have three 1s, three 4s, and three 7s to choose from. [a. 777; b. 111; c. 477]

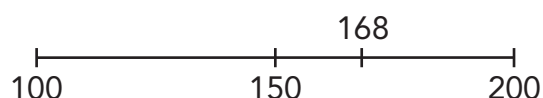
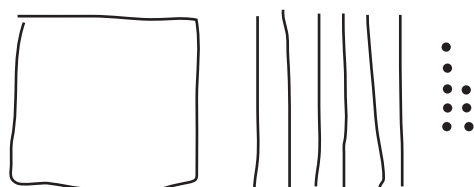


What is the number closest to 5,000 that you can make with the number cards 6, 3, 4, and 0? [4630]

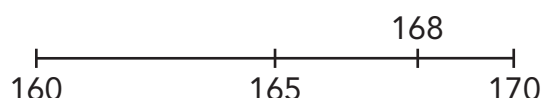
Try This

Bethany will take 168 brownies to the Bake Off. Round to the nearest hundred and to the nearest ten.

- If it helps, use Base Ten Blocks to model the number. Sketch the model.
- Sketch a number line segment to identify the nearest hundred.
- Sketch a number line segment to identify the nearest ten.

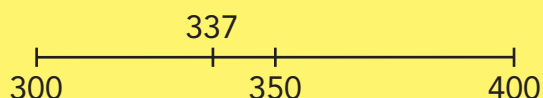
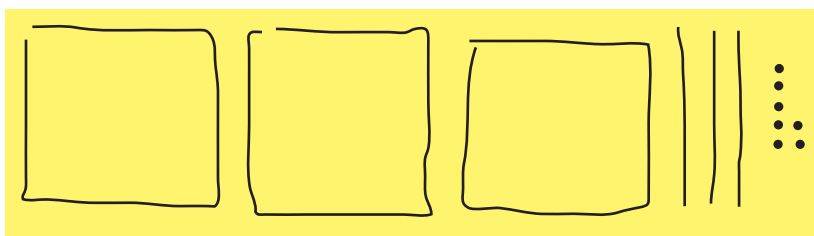


The nearest hundred is 200.

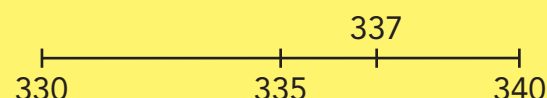


The nearest ten is 170.

1. The Smiths traveled 337 miles to Florida. Round to the nearest hundred and to the nearest ten.



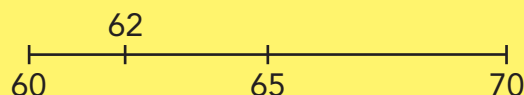
Nearest hundred: 300 miles



Nearest ten: 340 miles

2. At the school carnival, they ran out of pennies and nickels to make change. So they are rounding prices to the nearest 10¢. What will a 62¢ item cost?

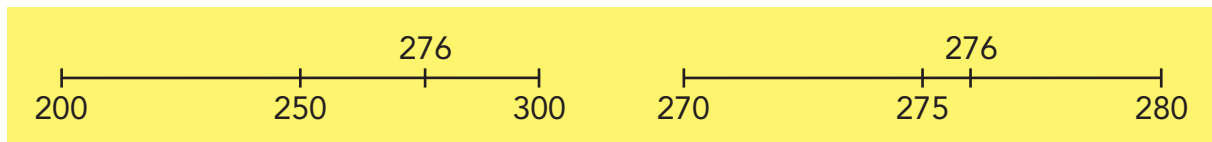
Students may sketch a model of 62—6 rods and 2 units.



Nearest 10¢: 60 ¢

3. Ruth's house is 276 feet from Gary's yard. Round to the nearest hundred and to the nearest ten.

Students may sketch a model of 276—2 flats, 7 rods, and 6 units



Nearest hundred: 300 feet

Nearest ten: 280 feet

Solve the problem. Make a sketch if it helps.

4. If you round each number in $83 - 18$ to the nearest ten, what will you find for the difference?

60

5. I am a number that rounds to 50. What number can I be? Justify your answer.

Any number 45–54.

6. I am a number that rounds to 60. One of my digits is 5. What number am I? Justify your answer.

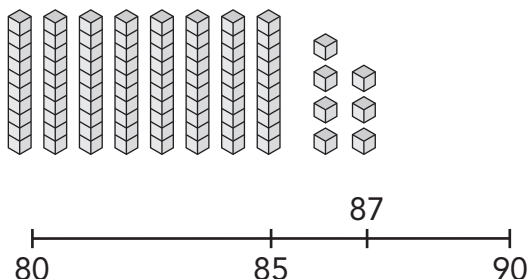
If the digit is in the tens place, answers can be 55–59. If the digit is in the ones place, the answer is 55.

7. Joel has about 300 baseball cards. Marco has 340 baseball cards. Is it possible for Joel to have more baseball cards than Marco? Justify your answer.

Yes, Joel could have 341–349 cards.

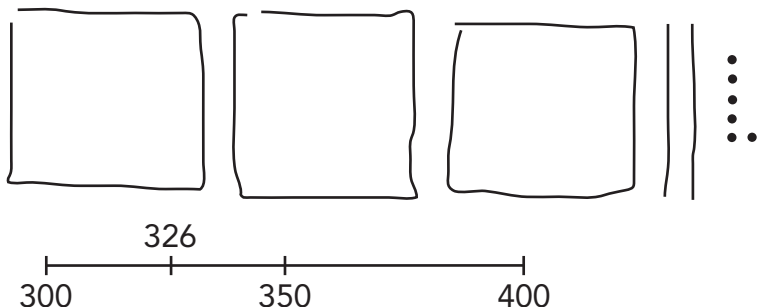
Use Base Ten Blocks to build the model. Use the model and the number line segment to complete the problem.

1. Jackson traveled 87 miles in one day. Round to the nearest ten.



Nearest ten: 90 miles

2. Dina rode her new motorcycle 326 miles last weekend. Round to the nearest hundred.

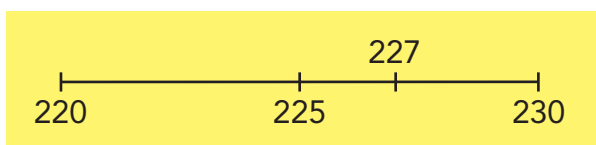
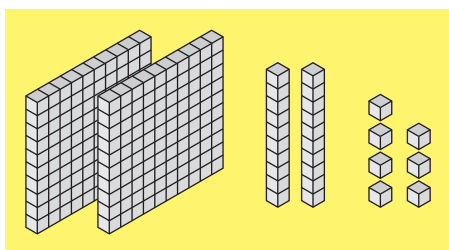


Nearest hundred: 300 miles

Use Base Ten Blocks to model the number. Draw your model. Draw and use a number line segment to help you complete the problem.

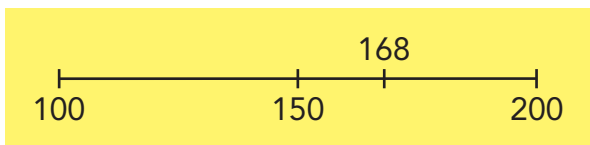
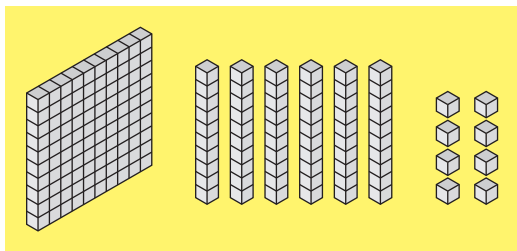
Students may draw shorthand versions of the models. Check drawings.

3. Sanjay took 227 steps from his house to the street. Round to the nearest ten.



Nearest ten: 230 steps

4. Sandra took 168 steps from her house to the back fence. Round to the nearest hundred.



Nearest hundred: 200 steps

Solve each problem.

5. Jamie read about 50 books this summer. Michelle read 46 books. Is it possible that Michelle read more books than Jamie? Justify your answer.

Yes; Jamie could have read 45 books.

6. I am a number that rounds to 100. What can I be? Justify your answer.

50–149

7. At Saturday's football game, four players gained yards carrying the ball. Raj gained 78, Brad gained 72, Derek gained 68, and Steve gained 88. If the coach rounds to the nearest 10 yards, which player's yardage will be rounded to 80 yards?

Raj's yardage

5

Suzanne builds stools (3 legs) and tables (5 legs). She counted 34 legs total. Is this possible or not? Explain your answer.

ANSWER: Sample: This is possible. There could be 24 stool legs (8 stools) and 10 table legs (2 tables). Also, 9 stool legs (3 stools) and 25 table legs (5 tables) give a total of 34 legs.

COMMENTS & EXTENSIONS: A challenge is for students to list all the possible combinations of legs that Suzanne could have counted, assuming that she has both stools and tables, up to 50 legs total.



Try This

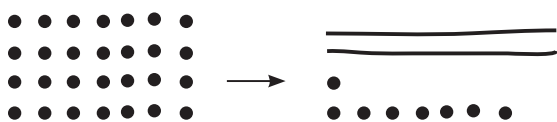
Ahmad bought 4 bags of apples. Each bag held 7 apples. He gave 11 of the apples away. How many did he keep?

- Estimate the answer.
- Use Base Ten Blocks to model each step of the problem, and draw each model.
- Write an equation for each step.

Think, 4 bags of $(5 + 2)$ apples is $20 + 8$ apples, which is 28, or about 30. Ahmad gave away 11 apples, which is about 10.

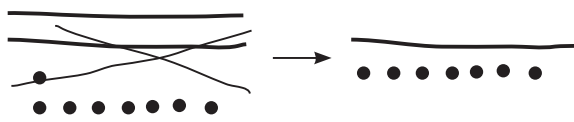
Estimate: $30 - 10 = 20$.

Step 1:



Equation: $4 \times 7 = 28$

Step 2:



Equation: $28 - 11 = 17$

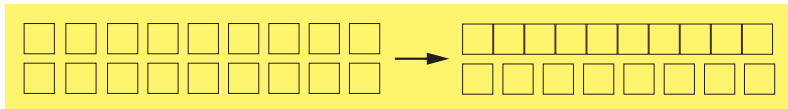
Models will vary.

Students may use shorthand methods for sketching models.

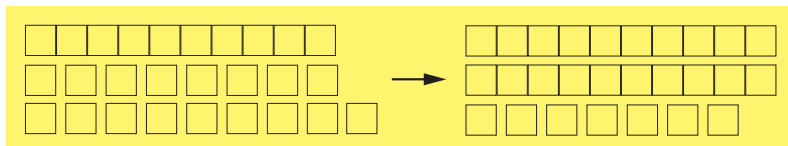
1. Joe has 9 books. His sister has 2 times as many books. How many books do they have together?

Estimate: Answers will vary.

Step 1 Equation: $2 \times 9 = 18$



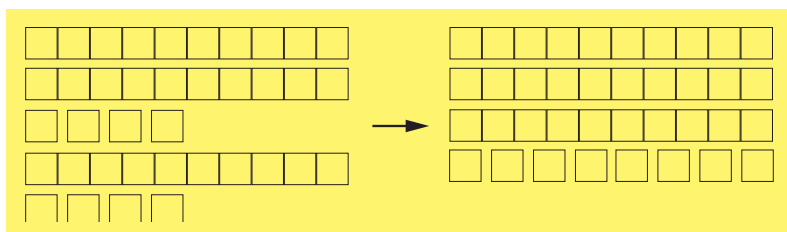
Step 2 Equation: $18 + 9 = 27$



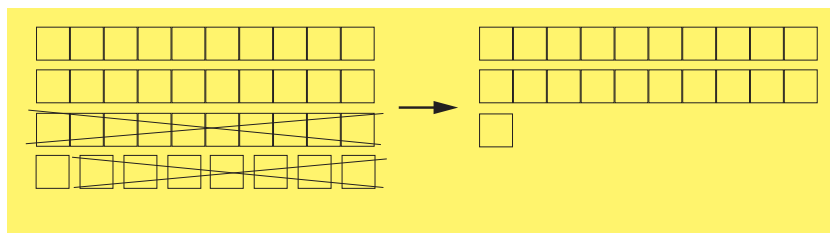
2. Jack purchased 18 trading cards on Monday and 27 on Tuesday. Each trading card sheet holds 9 cards. How many sheets does he need to hold all his cards?

Estimate: _____ **Answers will vary**

Step 1 Equation: _____ **$18 + 27 = 45$**



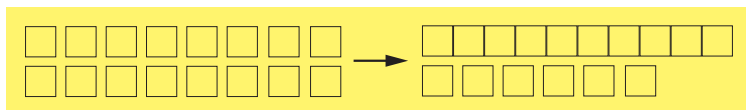
Step 2 Equation: _____ **$45 \div 9 = 5$**



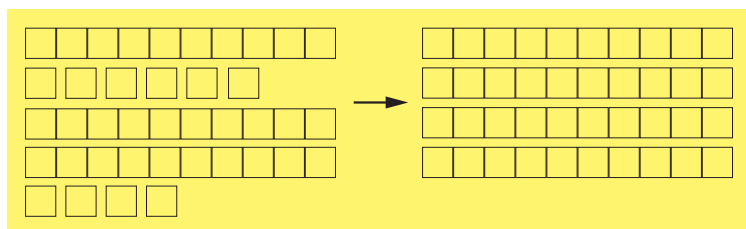
3. Tia made 24 cupcakes. Then she realized she did not have enough for the party. She made 2 batches of 8 cupcakes each. How many cupcakes did she have?

Estimate: _____ **Answers will vary**

Step 1 Equation: _____ **$2 \times 8 = 16$**



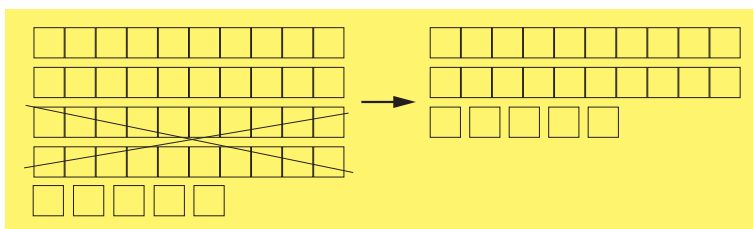
Step 2 Equation: _____ **$16 + 24 = 40$**



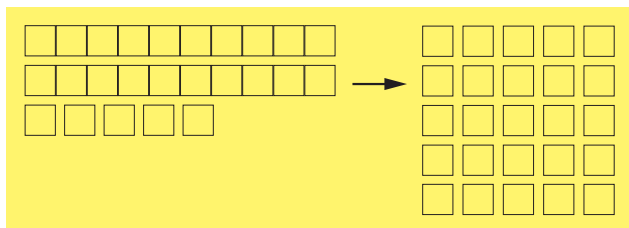
4. Carson made 45 paper footballs. He kept 20 of them. He shared what was left equally with his five friends. How many paper footballs did each friend get?

Estimate: Answers will vary

Step 1 Equation: $45 - 20 = 25$



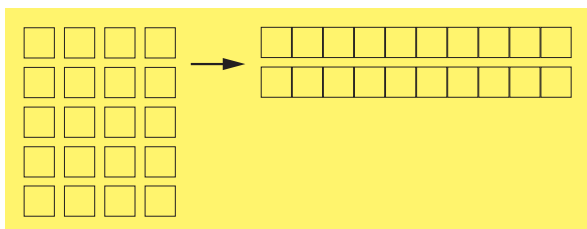
Step 2 Equation: $25 \div 5 = 5$



5. Colin purchased 5 boxes of paper airplanes. Each box has 4 paper airplanes. He gave 8 paper airplanes to his brother. How many did Collin keep?

Estimate: Answers will vary

Step 1 Equation: $5 \times 4 = 20$



Step 2 Equation: $20 - 8 = 12$

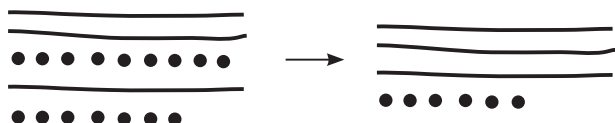


Use Base Ten Blocks to build the models. Use the models to complete the problem.

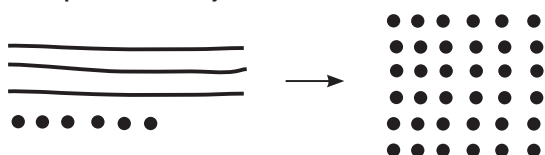
1. Sally and Shelly like to make charm bracelets. Sally has 19 charms. Shelly has 17 charms. They have 6 bracelets. How many charms are on each bracelet?

Estimate: (Example) $20 + 20 = 40$; $40 \div 5 = 8$

Step 1 Equation: $19 + 17 = \underline{36}$



Step 2 Equation: $36 \div 6 = \underline{6}$



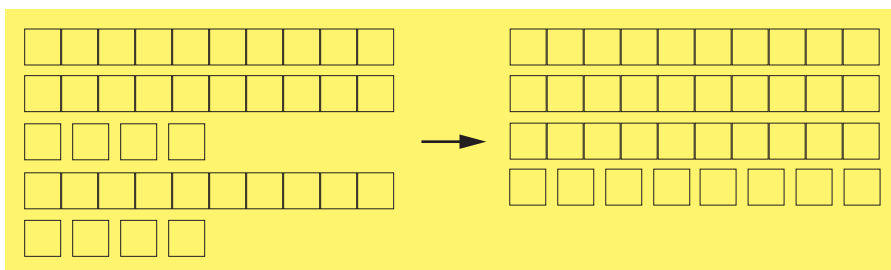
Using Base Ten Blocks, build models for each step in the problem. Draw your models. Use your models to complete the problem.

2. Mrs. Abel bought 24 pencils and 14 erasers for her class. She gave 17 pencils and erasers to her students. She kept the rest. How many items did she keep?

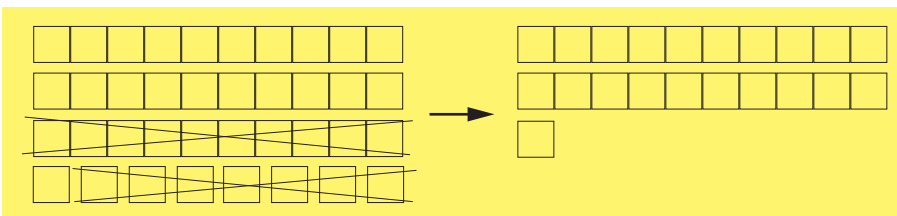
Estimate: _____ Answers will vary. _____

Students may use shorthand methods for sketching models.

Step 1 Equation: _____ $24 + 14 = 38$ _____



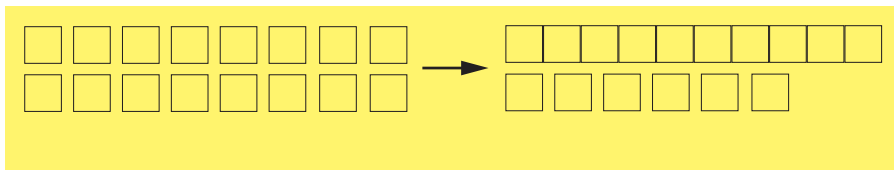
Step 2 Equation: _____ $38 - 17 = 21$ _____



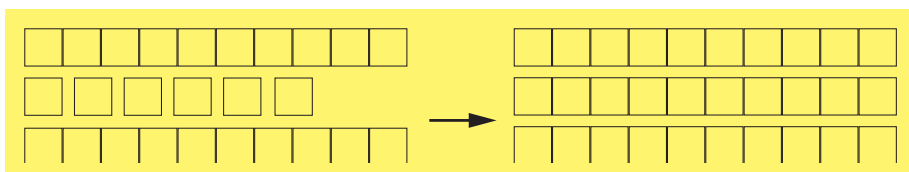
3. Ben and Zach like to collect rocks. Ben purchased 3 boxes of rocks. Each box holds 8 rocks. Ben gave Zach 12 of the rocks. How many rocks does Ben have left?

Estimate: Answers will vary.

Step 1 Equation: $3 \times 8 = 24$



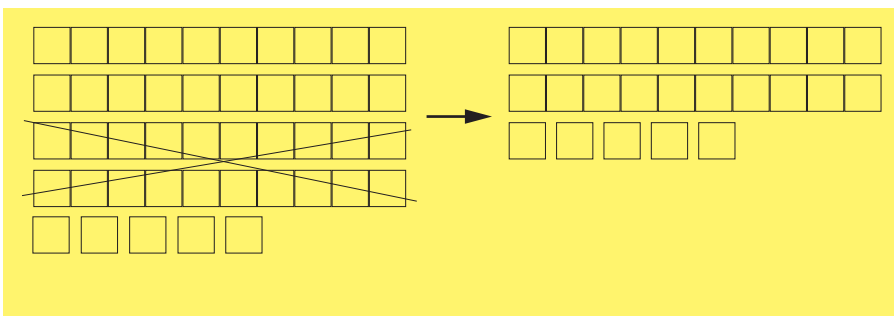
Step 2 Equation: $24 - 12 = 12$



4. Allie and Alison each made 24 cookies. They need to put them in boxes for the bake sale. Each box can hold 6 cookies. How many boxes will they need?

Estimate: Answers will vary.

Step 1 Equation: $24 + 24 = 48$



Step 2 Equation: $48 \div 6 = 8$

