

NELSON

Leaps AND Bounds TOWARD Math Understanding



**Student Resource
Sampler: Number
Topics 4–5,
Draft Material**

Leaps AND Bounds TOWARD Math Understanding

With Leaps and Bounds, mathematics is as easy as 1, 2, 3!

Step 1: Administer the diagnostic assessment






Step 2: Select the intervention pathway

Step 3: Choose an open-ended intervention or guided intervention based on your students' learning preferences or your instructional situation

Name: _____ Date: _____

Multiplying Whole Numbers

Diagnostic Test

- How much more is 4×6 than 3×6 ? _____ more
 a) How much more is 8×2 than 5×2 ? _____ more
 c) How much more is 7×9 than 6×9 ? _____ more
 d) How much more is 5×9 than 3×9 ? _____ more
- What multiplication is shown?
 a)  _____
 b)  _____
 c)  _____
 d)  _____
 e)  _____
- Calculate using mental math.
 a) $4 \times 9 =$ _____
 b) $3 \times 7 =$ _____
 c) $8 \times 6 =$ _____
 d) $7 \times 4 =$ _____
 e) $8 \times 40 =$ _____
 f) $9 \times 60 =$ _____
 g) $6 \times 300 =$ _____
 h) $30 \times 50 =$ _____

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Name: _____ Date: _____

- Estimate.
 a) 5×34 is about _____
 b) 7×68 is about _____
 c) 9×234 is about _____
 d) 6×475 is about _____
 e) 32×56 is about _____
 f) 82×68 is about _____
- Calculate.
 a) $7 \times 51 =$ _____
 b) $3 \times 648 =$ _____
 c) $42 \times 72 =$ _____
 d) $53 \times 43 =$ _____
- Describe a situation where you would use each multiplication.
 a) 5×23 _____
 b) 7×14 _____
 c) 22×23 _____

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Teacher Resource

Intervention Pathways
 The purpose of the intervention pathways is to help students multiply. The focus is to prepare them for working with a broader range of products and, eventually, decimal products as well.

- Pathway 1: Multiplying Two-Digit Numbers
- Pathway 2: Multiplying by One-Digit Numbers
- Pathway 3: Multiplication Fact Strategies

Use the chart below (or the Key to Pathways on Teacher's Resource pages 52 and 53) to determine which pathway is most suitable for each student or group of students.

Diagnostic Test Results	Intervention Pathway
If students struggle with Questions 2(a), 3(a), 4(a), 5(a), 6(a)	Use Pathway 1: Multiplying Two-Digit Numbers Teacher's Resource pages 54-55 Student Resource pages 55-59
If students struggle with Questions 2(b), 3(b), 4(b), 5(b), 6(b)	Use Pathway 2: Multiplying by One-Digit Numbers Teacher's Resource pages 56-57 Student Resource pages 60-64
If students struggle with Questions 1, 2(a), 3(a-d)	Use Pathway 3: Multiplication Fact Strategies Teacher's Resource pages 58-59 Student Resource pages 65-69

If students successfully complete Pathway 3 (or 2), they may or may not need the additional intervention provided by Pathway 2 (or 1). Either re-administer Pathway 2 (or 1) questions from the diagnostic, and/or encourage students to do a portion of the open-ended intervention for Pathway 2 (or 1) to decide if more work in that pathway would be beneficial.

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Teacher Resource

Name: _____ Date: _____

Multiplying Two-Digit Numbers

Pathway 1
Open-Ended

Raven is arranging books on bookshelves. She has to put between 30 and 90 books on each shelf. There are about 3000 books altogether.

- How many shelves can Raven fill if each shelf has the same number of books?
- How many books are on each shelf?
- How many books altogether are on the shelves?

Think of as many solutions as you can. Explain how you chose your numbers and how you did some of them.


You will need
 • base ten blocks

Name: _____ Date: _____

Multiplying Two-Digit Numbers

Pathway 1
Guided





Sarah has 12 boxes of baking cups. Each box holds 24 cups. You can multiply using a variety of strategies to figure out the total number of baking cups.

- You can use a doubling strategy. For example, figure out the number of cups in 6 boxes. Then double the product.
 $6 \times 24 = 144$, so
 $12 \times 24 = 2 \times 144 = 288$
- You can separate the tens and ones. For example, think of 12 as $10 + 2$. There are $10 \times 24 = 240$ baking cups in 10 boxes. There are $2 \times 24 = 48$ baking cups in 2 boxes. $240 + 48 = 288$ baking cups altogether.
- You can use an array. Imagine the baking cups in an array. Use base ten blocks to represent the array. 12 rows of 24 look like this:


You will need
 • base ten blocks

Remember
 When you look at an array of 12 rows of 24, you see 12 equal groups of 24 squares. Each row is one group. So you have 12 \times 24.

Try These

- Write the multiplication expression that goes with each model. One expression has no match.
 a)  34×15 23×24 52×41 18×26 32×43
 b)  _____
 c)  _____
 d)  _____
- Draw a line to match each multiplication expression with a description of how to complete it.
 23×26 $30 \times 60 + 2 \times 60 + 2 \times 30 + 2 \times 2$
 32×62 $30 \times 20 + 6 \times 30 + 2 \times 20 + 2 \times 6$
 63×22 $20 \times 20 + 3 \times 20 + 6 \times 20 + 3 \times 6$
 32×26 $20 \times 60 + 3 \times 20 + 2 \times 60 + 3 \times 2$
- Estimate. Your estimates should have 0s in the ones and tens digits.
 a) 53×47 is about _____
 b) 29×37 is about _____
 c) 62×13 is about _____
 d) 72×22 is about _____

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Student Resource

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Use the Diagnostic Tool in the Teacher's Resource to determine the most appropriate pathway for each student for each topic.

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Multiplying Two-Digit Numbers

Pathway 1
OPEN-ENDED

Raven is arranging books on bookshelves.
She has to put between 30 and 90 books on each shelf.
There are about 3000 books altogether.

You will need

- base ten blocks

- How many shelves can Raven fill if each shelf has the same number of books?

How many books are on each shelf?

How many books altogether are on the shelves?

Think of as many solutions as you can.

Explain how you chose your numbers and how you did some of your calculations.

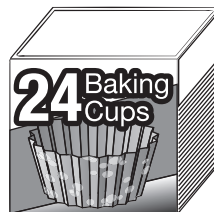


Multiplying Two-Digit Numbers

Pathway 1
GUIDED

Sarah has 12 boxes of baking cups.
Each box holds 24 cups.

You can multiply using a variety of strategies to figure out the total number of baking cups.



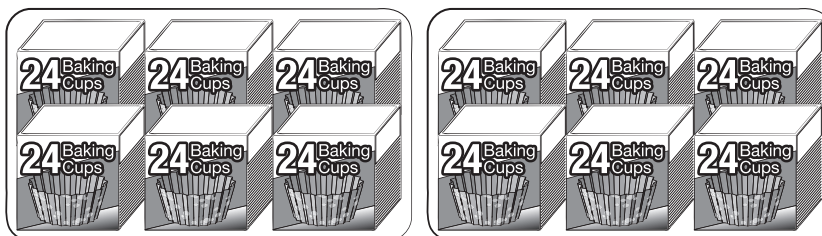
You will need

- base ten blocks

- You can use a doubling strategy.

For example, figure out the number of cups in 6 boxes. Then double the **product**.

$$\begin{aligned} 6 \times 24 &= 144, \text{ so} \\ 12 \times 24 &= 2 \times 144 \\ &= 288 \end{aligned}$$



- You can separate the tens and ones.

For example, think of 12 as $10 + 2$.

There are $10 \times 24 = 240$ baking cups in 10 boxes.

There are $2 \times 24 = 48$ baking cups in 2 boxes.

$240 + 48 = 288$ baking cups altogether.

product

the result when you multiply

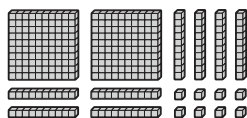
$$3 \times 4 = 12 \leftarrow \text{product}$$

- You can use an array.

Imagine the baking cups in an array.

Use base ten blocks to represent the array.

12 rows of 24 looks like this:



There are 2 hundreds, 8 tens, and 8 ones.
That is 288.

The 2 hundreds come from 10×20 .

The 8 tens come from 10×4 and 2×20 .

The 8 ones come from 2×4 .

$$\begin{array}{r} 24 \\ \times 12 \\ \hline 200 \text{ (} 10 \times 20 \text{)} \\ 40 \text{ (} 10 \times 4 \text{)} \\ 40 \text{ (} 2 \times 20 \text{)} \\ + 8 \text{ (} 2 \times 4 \text{)} \\ \hline 288 \end{array}$$

Remember

- When you look at an array of 12 rows of 24, you see 12 equal groups of 24 squares. Each row is one group. So you have 12×24 .

- Which strategy makes the most sense to you? Why?

Try These

1. Write the multiplication expression that goes with each model. One expression has no match.

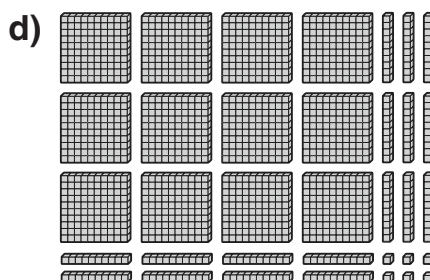
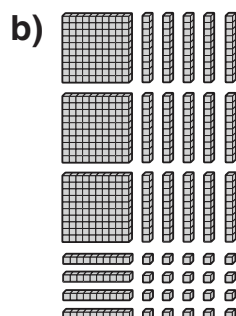
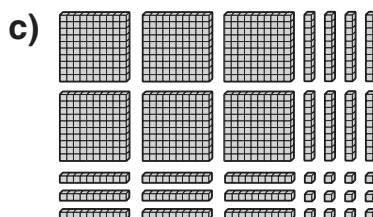
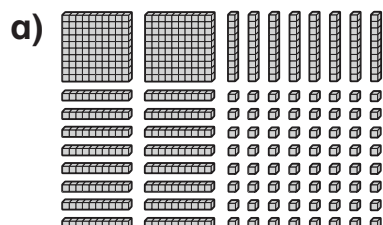
34×15

23×34

52×41

18×28

32×43



2. Draw a line to match each multiplication expression with a description of how to complete it.

23×26

$30 \times 60 + 2 \times 60 + 2 \times 30 + 2 \times 2$

32×62

$30 \times 20 + 6 \times 30 + 2 \times 20 + 2 \times 6$

63×22

$20 \times 20 + 3 \times 20 + 6 \times 20 + 3 \times 6$

32×26

$20 \times 60 + 3 \times 20 + 2 \times 60 + 3 \times 2$

3. Estimate. Your estimates should have 0s in the ones and tens digits.

a) $53 \times \$47$ is about _____

b) $29 \times \$37$ is about _____

c) $62 \times \$13$ is about _____

d) $72 \times \$22$ is about _____

4. Calculate the total number. Show your thinking.

a) 12 boxes with 15 pencils in each box

b) 22 piles with three \$5 bills and 1 loonie in each pile

c) 14 hours of work earning \$14 each hour

d) 18 classes with 24 students in each class



5. Calculate.

a)
$$\begin{array}{r} 43 \\ \times 32 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 29 \\ \times 37 \\ \hline \end{array}$$

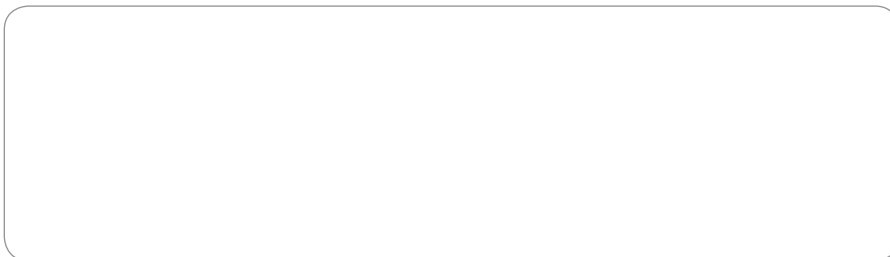
b)
$$\begin{array}{r} 43 \\ \times 61 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 17 \\ \times 72 \\ \hline \end{array}$$

6. Draw a picture or use words to show that
 $38 \times 25 = 19 \times 50$.

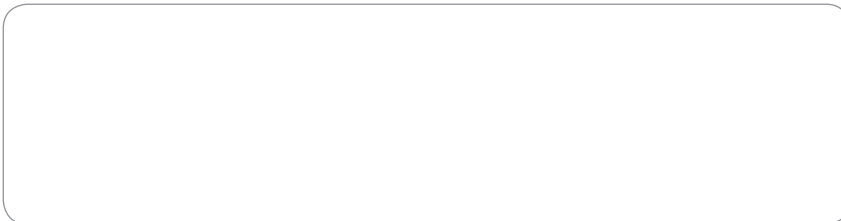


7. Omar multiplied 2 two-digit numbers and got a product close to 2500. What numbers might he have multiplied? Show 2 solutions.



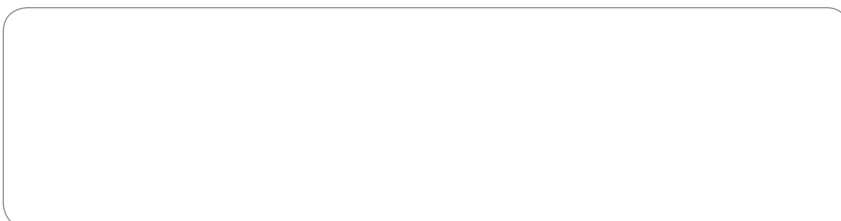
8. a) Use the digits 1, 5, 7, and 9 in the blanks to create the greatest product you can. Calculate the product.

$$\square\square \times \square\square = \underline{\hspace{2cm}}$$



- b) Use the digits 1, 5, 7, and 9 in the blanks to create the least product you can. Calculate the product.

$$\square\square \times \square\square = \underline{\hspace{2cm}}$$



FYI

It is a good idea to understand that you can break up numbers in different ways to multiply them.

Multiplying by One-Digit Numbers

Pathway **2**
OPEN-ENDED

A truck can hold up to 3000 kg in a load of crates.
In each load, all the crates have the same mass.

- If the truck loads fewer than 10 crates and the total mass is almost 3000 kg, what masses might the crates have?

Think of as many solutions as you can.

Explain how you chose your numbers and how you did some of your calculations.

You will need

- base ten blocks



Multiplying by One-Digit Numbers

Pathway 2
GUIDED

Thomas bought 3 bags of trail mix.
Each bag had a mass of 224 g.
You can use a variety of strategies to figure out the total number of grams.

You will need

- base ten blocks



- You can calculate the **product** using repeated addition.

There are 3 groups of 224.

$$224 + 224 + 224 = 672$$

$$\text{So } 3 \times 224 = 672$$



product

the result when you multiply

$$3 \times 4 = 12 \leftarrow \text{product}$$

- You can multiply using repeated addition in parts.

Think of each group of 224 as
2 hundreds + 2 tens + 4 ones.

3 groups of 2 hundreds

3 groups of 2 tens

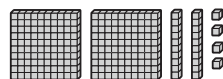
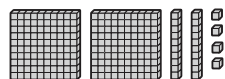
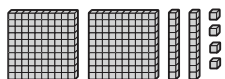
3 groups of 4 ones

$$6 \text{ hundreds} + 6 \text{ tens} + 12 \text{ ones} = 672$$

$$\begin{array}{r} 224 \\ \times 3 \\ \hline 600 \text{ (} 3 \times 200 \text{)} \\ 60 \text{ (} 3 \times 20 \text{)} \\ + 12 \text{ (} 3 \times 4 \text{)} \\ \hline 672 \end{array}$$

- You can multiply using base ten blocks.

Model the numbers using base ten blocks and count the total.



$$6 \text{ hundreds} + 6 \text{ tens} + 12 \text{ ones} = 672$$

- Which strategy do you prefer? Why?

Try These

1. Write the multiplication expression that goes with each model. One expression has no match.

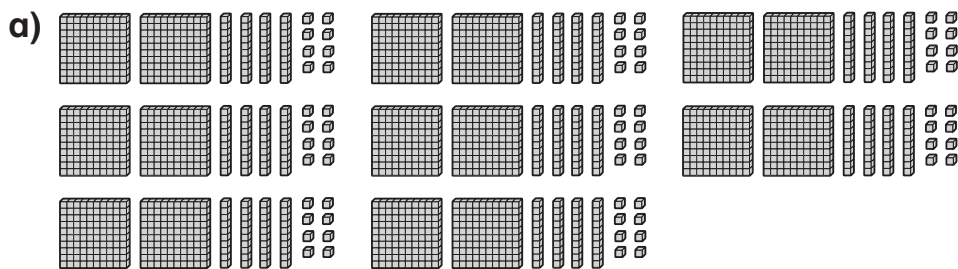
5×234

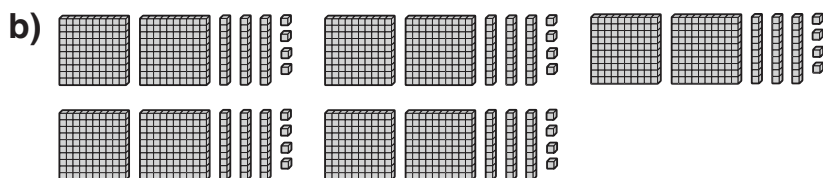
3×34

5×41

8×248

3×43

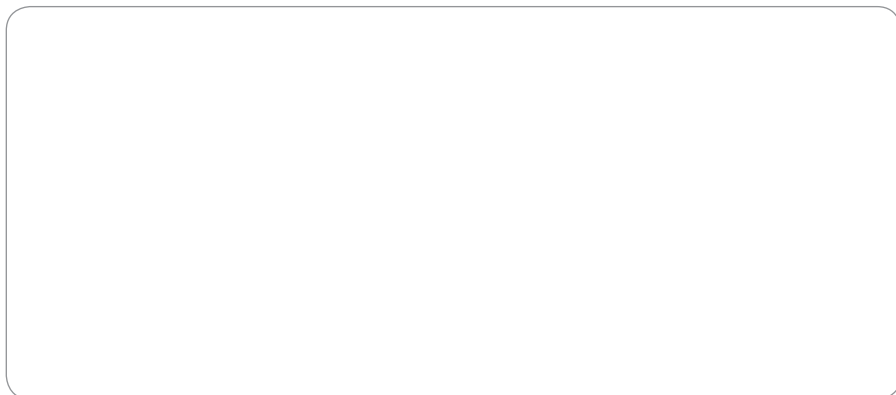








2. Draw pictures to show that $4 \times 10 = 40$ and $4 \times 100 = 400$.



3. Draw a line to match each multiplication expression with a description of how to complete it.

7×26	$2 \times 400 + 2 \times 70 + 2 \times 2$
5×362	$7 \times 20 + 7 \times 6$
2×472	$7 \times 50 + 7 \times 2$
7×52	$5 \times 300 + 5 \times 60 + 5 \times 2$

4. Estimate. Your estimates should have 0s in the ones digits.

- a) $5 \times \$47$ is about _____
- b) $4 \times \$37$ is about _____
- c) $6 \times \$213$ is about _____
- d) $7 \times \$822$ is about _____

5. Calculate the total number or cost. Show your thinking.

- a) 5 shirts that cost \$16 each

- b) 8 books with 18 pages per book

- c) 6 video game consoles that cost \$289 each



6. Calculate.

a)
$$\begin{array}{r} 41 \\ \times 5 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 362 \\ \times 7 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 37 \\ \times 4 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 213 \\ \times 6 \\ \hline \end{array}$$

7. Draw a picture or use words to show that 8×28 is double 4×28 .

8. Edwin multiplied 2 numbers and got a product close to 250. What numbers might he have multiplied? Show 3 solutions.

9. Use the digits 5, 7, and 9 in the blanks to create the greatest product you can. Calculate the product.

$\square \times \square \square = \underline{\hspace{2cm}}$

FYI

It is a good idea to understand that you can break up numbers in different ways to multiply them.

Multiplication Fact Strategies

Pathway 3
OPEN-ENDED

Ariana says that if you know how to multiply by 2 and by 5, you can figure out any **multiplication fact**.

- Use pictures, numbers, and/or words to explain why Ariana is right.

You will need

- counters

multiplication fact
a statement that
shows the product of
2 one-digit numbers
e.g., $8 \times 4 = 32$

- Make up your own sentence:

If you know how to multiply by _____ and by _____, you can figure out any multiplication fact.

Use at least one number that is different from Ariana's. Explain your thinking.

If you know how to multiply by 2 and by 5, you can figure out any multiplication fact.



Multiplication Fact Strategies

Pathway 3
GUIDED

Suppose you are setting up tables and chairs for a dinner.
You can use 9 tables, but you don't have to use all of them.
Each table can have up to 9 chairs.
The same number of chairs should be at each table.

You will need

- counters or square tiles



You can use **multiplication fact** strategies to figure out the total number of seats for different numbers of tables and chairs.

- You can multiply using a doubling strategy.

Use what you know about multiplying by 2 (doubling).
Since $2 \times 7 = 14$, 2 tables of 7 can seat $7 + 7 = 14$.



4×7 is double 2×7 .

$$14 + 14 = 28$$

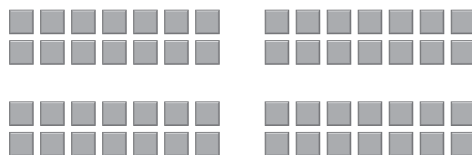
4 tables of 7 can seat 28 people.



8×7 is double 4×7 .

$$28 + 28 = 56$$

8 tables of 7 can seat 56 people.



multiplication fact

a statement that shows the product of 2 one-digit numbers
e.g., $8 \times 4 = 32$

product

the result when you multiply

$$3 \times 4 = 12 \leftarrow \text{product}$$

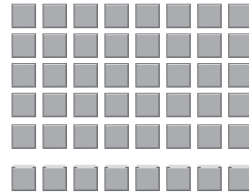


- You can use a skip-counting strategy.

For example, use what you know about multiplying by 5. You say 5, 10, 15, 20, 25, 30, 35, 40, 45 when you count by 5s. So 9 tables with 5 people at each table can seat 45 people (the 9th number you say).

- You can multiply in parts.

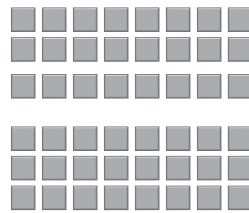
For example, if there are 6 tables of 8 people, you can think $5 \times 8 = 40$ and another 8 makes 48.



You can also think of 3×8 first.

$$\begin{aligned} 3 \times 8 &= 2 \times 8 + 1 \times 8 \\ &= 16 + 8 \\ &= 24 \end{aligned}$$

6×8 is twice as much as 3×8 .
 $24 + 24 = 48$



Try These

- 3 tables with 6 chairs seat 18 people.

That means $3 \times 6 = 18$.

How can you use that fact to complete each product?

a) 6×6

c) 5×6

b) 7×6

d) 9×6



2. How can you use $4 \times 9 = 36$ to complete each product?

a) 2×9

c) 4×8

b) 6×9

d) 5×9

3. List the multiplication facts for each product.

Remember, multiplication facts are one-digit numbers multiplied by one-digit numbers.

a) 24 _____

b) 48 _____

c) 36 _____

4. What is a good strategy for each situation?

a) multiplying by 3

b) multiplying by 6

c) multiplying by 7

FYI

Sometimes it is a lot faster to multiply in your head than to use a calculator or pencil and paper.

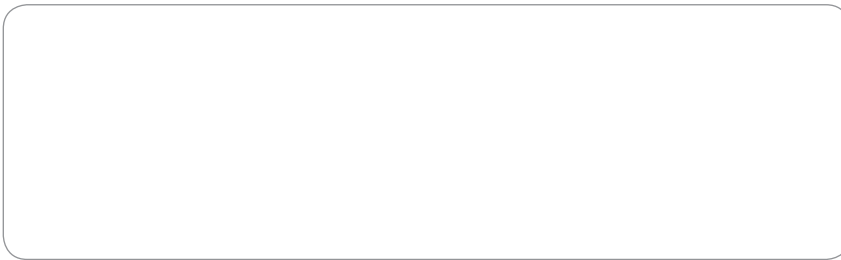
Mental math also helps you check answers you get on a calculator to see if they make sense.

5. Draw a picture to show why each statement is true.

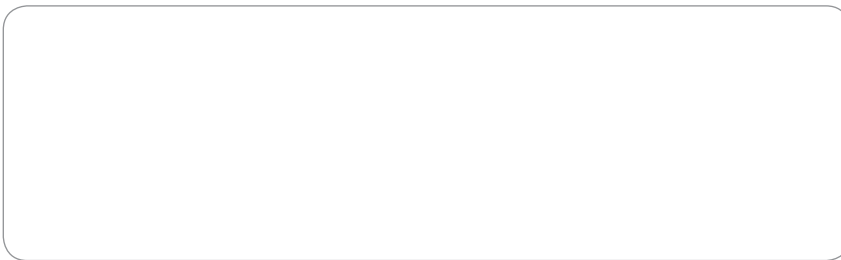
a) 4×5 is twice as much as 2×5 .



b) 3×7 is 7 more than 2×7 .



c) 8×9 is 8 less than 8×10 .



6. a) Fill in the blanks to make the sentence true.
Explain your thinking.

If you can multiply by _____, it is really easy to
multiply by _____ because _____
_____.

b) Fill in the blanks in a different way.
Explain your thinking.

If you can multiply by _____, it is really easy to
multiply by _____ because _____
_____.

Dividing Three-Digit Numbers

Pathway **1**
OPEN-ENDED

Julia was dividing some comic books into equal piles.
There were more than 100 but fewer than 1000 comic books.
She could make anywhere between 2 and 9 piles.

You will need

- base ten blocks

- **Step 1:** Choose a number of comic books.
Then choose a number of piles to divide them into.
- **Step 2:** Predict how many comic books will be in each pile
if the pile sizes are about equal.
Then calculate the number of comic books in each pile.
Explain your thinking.
- **Step 3:** Repeat Step 1 and Step 2 for a different number
of piles.
- **Step 4:** Repeat Step 1 to Step 3 for different numbers of
comic books.



Dividing Three-Digit Numbers

Pathway 1
GUIDED

The students in Zara's class raised \$457 for 3 charities. They want to give each charity the same amount.

You can divide using different strategies to figure out the amount for each charity.



- Estimate the **quotient** first.

It has to be more than \$100 because $3 \times \$100$ is only \$300.

- You can divide using your estimate and then adjust it.
Choose an amount each charity could get.
Then figure out how much money is left and share that amount.

For example, suppose you chose \$100 for each charity.

$$3 \times \$100 = \$300$$

$$\$457 - \$300 = \$157$$

There is still \$157 left to share.

If you gave each charity \$50 more, that would use $3 \times \$50 = \150 .

$$\$157 - \$150 = \$7, \text{ so there is } \$7 \text{ left.}$$

$$3 \times \$2 = \$6. \text{ Each charity can get } \$2 \text{ more.}$$

$$\text{Each charity gets } \$100 + \$50 + \$2 = \$152.$$

There is a \$1 **remainder**.

$$\begin{array}{r} 3 \overline{)457} \\ - 300 \\ \hline 157 \\ - 150 \\ \hline 7 \\ - 6 \\ \hline 1 \end{array} \begin{array}{l} 100 \\ 50 \\ 2 \\ 152 \end{array}$$

- You can divide in parts.

For example, break up 457 into numbers that are easy to divide by 3. Then divide each part of the number.

$$457 = 300 + 60 + 60 + 30 + 7$$

$$457 \div 3 = 300 \div 3 + 60 \div 3 + 60 \div 3 + 30 \div 3 + 6 \div 3 + 1$$

$$= 100 + 20 + 20 + 10 + 2 + 1$$

$$= 152 \text{ R1 (R1 means remainder 1.)}$$

$$100 + 20 + 20 + 10 + 2 \text{ R1}$$

$$3 \overline{)457} \text{ is } 3 \overline{)300 + 60 + 60 + 30 + 6 + 1}$$

You will need

- base ten blocks

quotient

the result of dividing

$$\text{e.g., } 12 \div 3 = 4$$



quotient

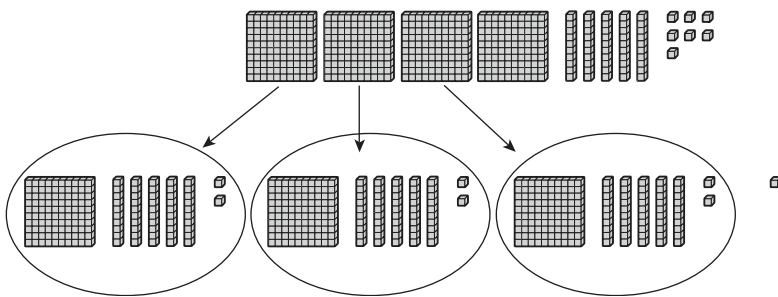
remainder

the amount left over after a number is divided into a whole number of equal parts

$$\text{e.g., } 44 \div 7 = 6$$

Remainder 2

- You can divide using base ten blocks.
Model 457 with base ten blocks.
Then share the blocks equally into 3 piles.
The number in 1 pile is the amount each charity gets.
For example, put 1 hundreds block in each circle.
Trade the leftover hundreds block for 10 tens.
Now there are 15 tens. Put 5 in each circle.
There are still 7 ones. Put 2 in each circle.
There is 1 ones block left over.



$$457 \div 3 = 152 \text{ R}1$$

Each charity gets \$152.

Remember

- You can check division by multiplying.
e.g., $464 \div 4 = 116$,
since $4 \times 116 = 464$.

Try These

- Write the division expression that goes with each model.
One expression has no match.

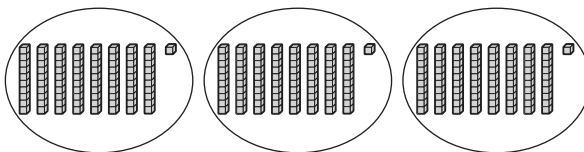
$$243 \div 3$$

$$465 \div 3$$

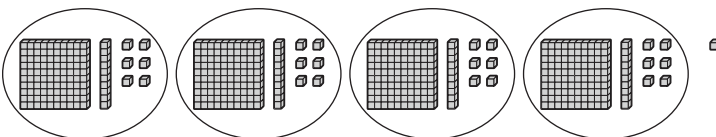
$$243 \div 5$$

$$465 \div 4$$

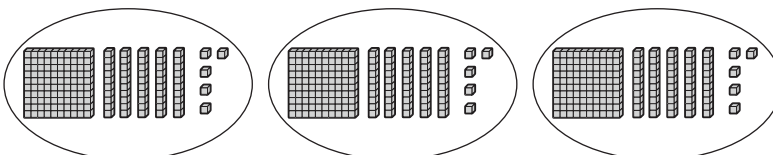
a)



b)



c)



2. Draw a line to match each division expression with a description of how you could complete it.

$276 \div 3$

$300 \div 5 + 50 \div 5 + 48 \div 5$

$398 \div 5$

$240 \div 3 + 30 \div 3 + 6 \div 3$

$153 \div 2$

$360 \div 6 + 120 \div 6 + 10 \div 6$

$490 \div 6$

$140 \div 2 + 13 \div 2$

3. Estimate. Your estimate should have a 0 in the ones place.

a) $850 \div 4$ is about _____

b) $884 \div 7$ is about _____

c) $295 \div 3$ is about _____

d) $708 \div 9$ is about _____

4. Calculate the size of each group and the remainder (if there is one). The objects are shared equally. Show your thinking.

a) 520 cards shared by 4 people

b) \$485 shared among 6 people

c) 494 cookies on 8 trays



5. Calculate.

a) $4 \overline{)563}$

c) $3 \overline{)965}$

b) $6 \overline{)372}$

d) $5 \overline{)265}$

6. What are some numbers that could be used to complete this sentence?

$\square\square\square \div \square = 94$

7. Rashid divided a three-digit number by a one-digit number. The remainder was 4.

$\square\square\square \div \square = \square\square\square \text{ R}4$

What might he have divided?

FYI

Different division strategies can be used in different situations to make dividing easier.

Dividing Two-Digit Numbers

Pathway 2
OPEN-ENDED

Evan delivers newspapers on Saturday mornings. He has more than 40 papers to deliver, but fewer than 100. Sometimes 1 friend helps him. Sometimes as many as 5 friends help.

You will need

- base ten blocks or counters and 10-frames (BLM 5)

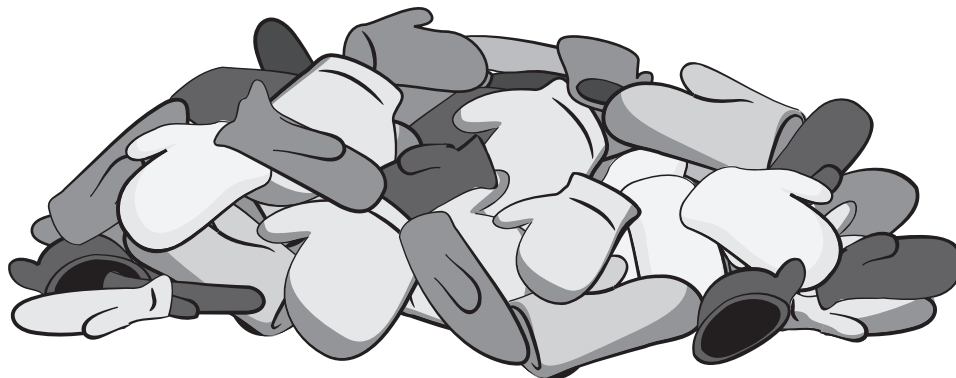
- **Step 1:** Choose a number of papers for Evan to deliver. Then choose the number of friends who will help.
- **Step 2:** Predict the number of papers each person will deliver if they each deliver about the same number. Be sure to include Evan. Then calculate the number of papers each friend will deliver. Explain your thinking.
- **Step 3:** Repeat Step 1 and Step 2 for a different number of friends.
- **Step 4:** Repeat Step 1 through Step 3 for different numbers of papers.



Dividing Two-Digit Numbers

Pathway 2
GUIDED

There are 72 mittens in a pile.



You will need

- base ten blocks or counters and 10-frames (BLM 5)

You can divide using different strategies to figure out the number of pairs of mittens.

- You can estimate first.

How do you know there are more than 30 pairs?

2×30 is 60, and 72 is more than 60.

- You can divide by using an estimate and then adjusting it.

Choose a number of pairs.

Figure out the number of mittens left.

Then decide how many more pairs you need.

For example, suppose you chose 30 pairs.

$2 \times 30 = 60$ mittens

$72 - 60 = 12$

There are still 12 mittens left.

$12 \div 2 = 6$ pairs

There are $30 + 6 = 36$ pairs of mittens.

$$\begin{array}{r} 2 \overline{)72} \\ - 60 \\ \hline 12 \\ - 12 \\ \hline 0 \end{array} \quad \begin{array}{l} 30 \\ 6 \\ \hline 36 \end{array}$$

- You can divide in parts.

$72 = 60 + 12$

$72 \div 2 = 60 \div 2 + 12 \div 2$

$= 30 + 6$

$= 36$

$2 \overline{)72}$ is $2 \overline{)60 + 12}$

Remember

- You can check division by multiplying.
e.g., $64 \div 4 = 16$,
since $4 \times 16 = 64$.

- You can divide using base ten blocks.

Model 72 with base ten blocks.

Then share the blocks equally in 2 piles.

The number in 1 pile is the number of pairs, since the matching mitten is in the other pile.

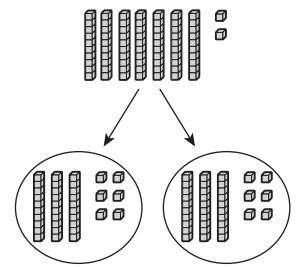
For example, put 3 tens into each circle.

Trade the other tens block for 10 ones.

There are 12 ones in total.

Put 6 ones in each circle.

There are 36 mittens in each circle, so there are 36 pairs.



- Sometimes there is a **remainder** after you make your equal groups.

For example, $73 \div 2 = 36 + \text{Remainder } 1$

That is because there are not enough mittens to make another pair.

remainder

the amount left over after a number is divided into a whole number of equal parts

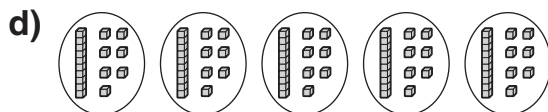
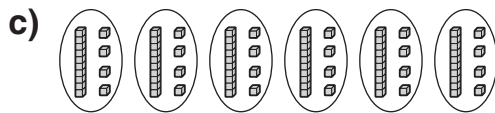
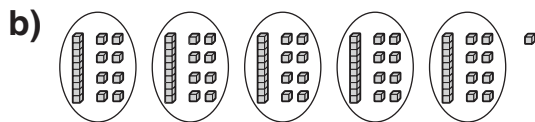
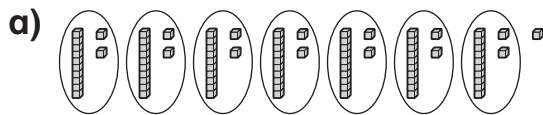
e.g., $44 \div 7 = 6$

Remainder 2

Try These

- Write the division expression that goes with each model. One expression has no match.

$91 \div 5$ $65 \div 5$ $85 \div 5$ $85 \div 7$ $84 \div 6$



2. Draw a line to match each division expression with a description of how you could complete it.

$76 \div 4$

$40 \div 4 + 13 \div 4$

$98 \div 6$

$40 \div 4 + 36 \div 4$

$53 \div 4$

$30 \div 6 + 60 \div 6$

$90 \div 6$

$60 \div 6 + 38 \div 6$

3. Estimate.

a) $50 \div 4$ is about _____ c) $95 \div 3$ is about _____

b) $84 \div 7$ is about _____ d) $98 \div 9$ is about _____

4. Calculate the size of each pile and the remainder (if there is one). The objects are shared equally. Show your thinking.

a) 88 pencils in 4 piles

b) 80 pennies in 6 piles



c) 95 photos in 5 piles

d) 94 cookies on 7 trays

5. Calculate.

a) $3 \overline{)52}$

c) $2 \overline{)56}$

b) $4 \overline{)98}$

d) $7 \overline{)91}$

6. Draw a picture to show that $64 \div 4$ is twice as much as $64 \div 8$.

7. What are some numbers that can be used to complete this sentence?

$\square\square \div \square = 14$

8. Nabil divided a two-digit number by a one-digit number. The remainder was 4. $\square\square \div \square = \square R4$
What might he have divided?

FYI

Different division strategies can be used in different situations to make dividing easier.

Division Fact Strategies

Pathway 3
OPEN-ENDED

Grace says you can use a multiplication table to figure out answers to a lot of division questions.

For example, you can figure out how to share 24 granola bars among different numbers of students by looking for 24 in the multiplication table.

- How can you use the multiplication table to share 24?
Give as many examples as you can.

×	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27
4	0	4	8	12	16	20	24	28	32	36
5	0	5	10	15	20	25	30	35	40	45
6	0	6	12	18	24	30	36	42	48	54
7	0	7	14	21	28	35	42	49	56	63
8	0	8	16	24	32	40	48	56	64	72
9	0	9	18	27	36	45	54	63	72	81

- How can you use the table to divide 26 by a number?

- What other **quotients** can you use the table to figure out?

Remember

- Sometimes there is an amount left over when you divide. Write R to show the remainder.
e.g., $13 \div 4 = 3 \text{ R}1$ means that there is a remainder of 1 when you share 13 among 4 people.

quotient

the result of dividing
e.g., $12 \div 3 = 4$
 ↑
 quotient

Devon has \$47 to buy 5 presents for his friends.

He wants to spend the same amount on each present.

You can divide using different strategies to figure out the amount for each present.



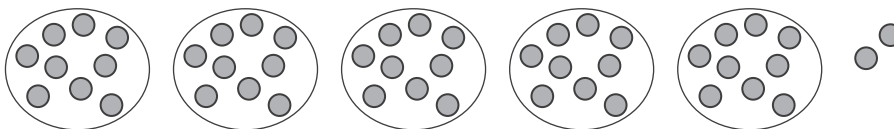
You will need

- counters

- You can divide using counters.

For example, make 5 equal piles of counters.

Keep putting the same number of counters in each pile until all 47 counters are used up.



$$47 \div 5 = 9 \text{ Remainder } 2, \text{ or } R2$$

Devon has \$9 for each present. He will have \$2 left over.

- You can divide by choosing an estimate and then adjusting it.

For example, suppose you choose \$5 for each present.

$$5 \times \$5 = \$25$$

$$\$47 = \$25 + \$22$$

There is \$22 left to spend.

If you use \$4 more for each present, you will spend

$$5 \times \$4 = \$20 \text{ more.}$$

$$\$5 + \$4 = \$9$$

So each present could cost \$9 and

Devon would have \$2 left over.

Remember

- Sometimes there is an amount left over when you divide. Write R to show the remainder.
e.g., $13 \div 4 = 3 R1$ means that there is a remainder of 1 when you share 13 among 4 people.

- You can divide using backwards multiplication.

If you figure out $5 \times \blacksquare = 47$, you will have the answer.
Since 5 tens is 50, you know the answer is a little less than 10.

$$5 \times 9 = 45$$

$$47 - 45 = 2$$

So each present could cost \$9, and Devon would have \$2 left over.

Try These

1. Solve each sharing problem. Explain your thinking.

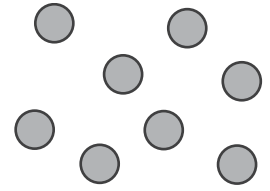
- a) 6 people are sharing \$36.

- b) 7 people are sharing \$28.

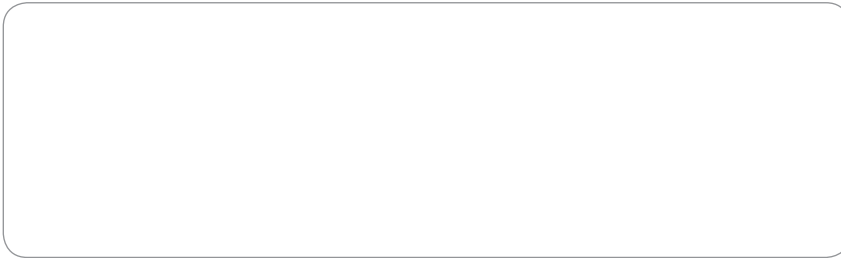
- c) 9 people are sharing \$45.

2. Use counters to divide. Sketch a picture of your counters.

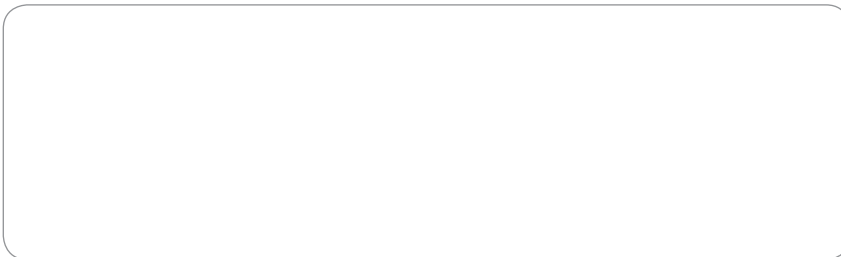
a) $36 \div 9 = \underline{\hspace{2cm}}$



b) $44 \div 7 = \underline{\hspace{2cm}}$

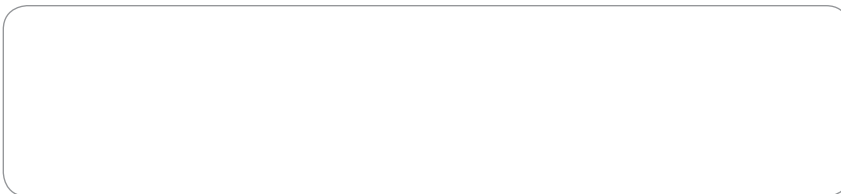


c) $59 \div 8 = \underline{\hspace{2cm}}$

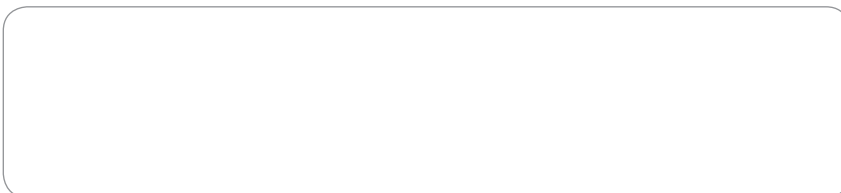


3. How can you use $5 \times 6 = 30$ to complete each equation?

a) $30 \div 5 = \underline{\hspace{2cm}}$



b) $31 \div 5 = \underline{\hspace{2cm}}$



4. Calculate.

a) $54 \div 6 =$ _____

d) $29 \div 7 =$ _____

b) $63 \div 9 =$ _____

e) $46 \div 5 =$ _____

c) $38 \div 6 =$ _____

f) $83 \div 9 =$ _____

5. Draw a picture to show that each statement is true.

a) $42 \div 6$ is the same as $30 \div 6 + 12 \div 6$.

b) $54 \div 9$ is double $27 \div 9$.

6. a) Fill in the blanks to make the sentence true.

Explain your thinking.

If you know how to multiply one-digit numbers by _____,

it is easy to figure out questions like $26 \div$ _____.

b) Fill in the blanks a different way. Explain your thinking.

If you know how to multiply one-digit numbers by _____,

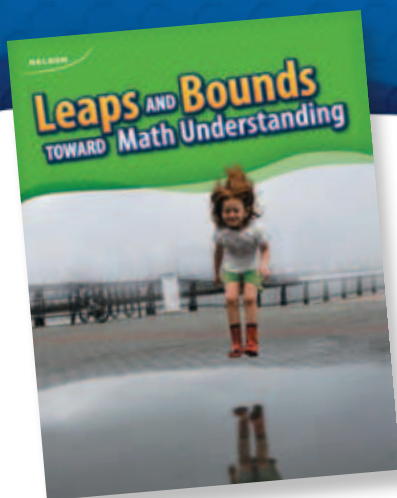
it is easy to figure out questions like $26 \div$ _____.

FYI

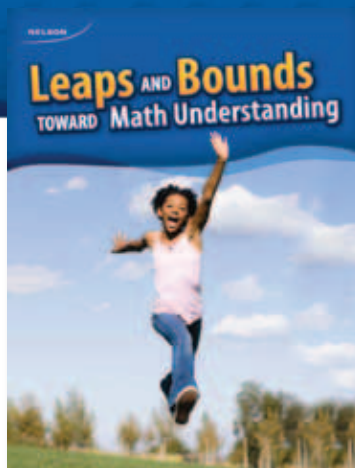
You can use different division strategies depending on the situation.

Leaps AND Bounds TOWARD Math Understanding

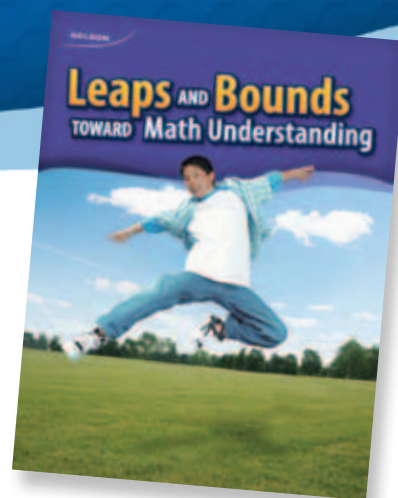
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04/11

ISBN-10 0-17-651791-X
ISBN-13 978-0-17-651791-5



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