PEARSON

Math Makes Sense 5

Practice and Homework Book

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PEARSON

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PEARSON

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Geometry

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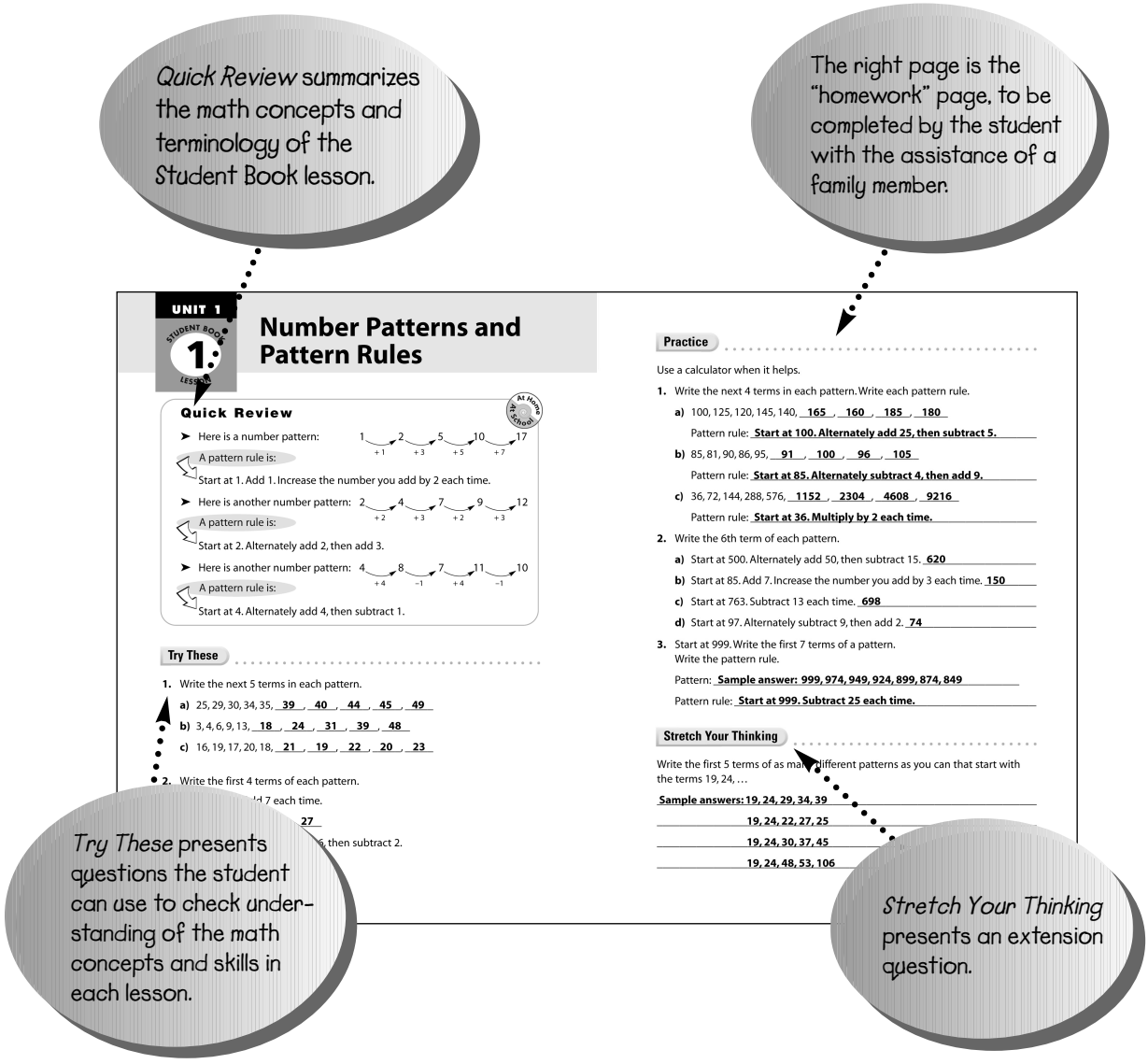
To the Teacher

This Practice and Homework Book provides reinforcement of the concepts and skills explored in the Pearson *Math Makes Sense 5* program.

There are two sections in the book. The first section follows the sequence of *Math Makes Sense 5* Student Book. It is intended for use throughout the year as you teach the program. A two-page spread supports the content of each core lesson in the Student Book.

In each Lesson:



Math at Home

The second section of the book, on pages 127 to 138, consists of 3 pull-out **Math at Home** magazines. These fun pages contain intriguing activities, puzzles, rhymes, and games to encourage home involvement. The perforated design lets you remove, fold, and send home this eight-page magazine after the student has completed Units 3, 6, and 8.

To the Family

This book will help your child practise the math concepts and skills that have been explored in the classroom. As you assist your child to complete each page, you have an opportunity to become involved in your child's mathematical learning.

The left page of each lesson contains a summary of the main concepts and terminology of the lesson. Use this page with your child to review the work done in class. The right page contains practice.

Here are some ways you can help:

- With your child, read over the Quick Review. Encourage your child to talk about the content and explain it to you in his or her own words.
- Read the instructions with (or for) your child to ensure your child understands what to do.
- Encourage your child to explain his or her thinking.
- Some of the pages require specific materials. You may wish to gather items such as a centimetre ruler, index cards, a measuring tape, scissors, number cubes labelled 1 to 6, and paper clips.

Many of the Practice sections contain games that will also improve your child's math skills. You may have other ideas for activities your child can share with the rest of the class.

The **Math at Home** pull-out pages 127 to 138 provide more fun activities.

UNIT 1

STUDENT BOOK 1 LESSON

Number Patterns and Pattern Rules

Quick Review

At Home At School

➤ Here is a number pattern: 1 (+1) 2 (+3) 5 (+5) 10 (+7) 17

A pattern rule is:

Start at 1. Add 1. Increase the number you add by 2 each time.

➤ Here is another number pattern: 2 (+2) 4 (+3) 7 (+2) 9 (+3) 12

A pattern rule is:

Start at 2. Alternately add 2, then add 3.

➤ Here is another number pattern: 4 (+4) 8 (−1) 7 (+4) 11 (−1) 10

A pattern rule is:

Start at 4. Alternately add 4, then subtract 1.

Try These

1. Write the next 5 terms in each pattern.

a) 25, 29, 30, 34, 35, _____, _____, _____, _____, _____

b) 3, 4, 6, 9, 13, _____, _____, _____, _____, _____

c) 16, 19, 17, 20, 18, _____, _____, _____, _____, _____

2. Write the first 4 terms of each pattern.

a) Start at 6. Add 7 each time.

_____, _____, _____, _____

b) Start at 2. Alternately add 6, then subtract 2.

_____, _____, _____, _____

Practice

Use a calculator when it helps.

1. Write the next 4 terms in each pattern. Write each pattern rule.

a) 100, 125, 120, 145, 140, _____, _____, _____, _____

Pattern rule: _____

b) 85, 81, 90, 86, 95, _____, _____, _____, _____

Pattern rule: _____

c) 36, 72, 144, 288, 576, _____, _____, _____, _____

Pattern rule: _____

2. Write the 6th term of each pattern.

a) Start at 500. Alternately add 50, then subtract 15. _____

b) Start at 85. Add 7. Increase the number you add by 3 each time. _____

c) Start at 763. Subtract 13 each time. _____

d) Start at 97. Alternately subtract 9, then add 2. _____

3. Start at 999. Write the first 7 terms of a pattern.
Write the pattern rule.

Pattern: _____

Pattern rule: _____

Stretch Your Thinking

Write the first 5 terms of as many different patterns as you can that start with the terms 19, 24, …

_____

_____

_____

_____

UNIT 1

STUDENT BOOK 2 LESSON

Using Patterns to Solve Problems

Quick Review

At Home At School

One box holds 15 books.

➤ How many books will 2 boxes hold? 3 boxes? 4 boxes?
Make a table.
Two boxes hold 30 books.
Three boxes hold 45 books.
Four boxes hold 60 books.

Number of Boxes	Number of Books
1	15
2	30
3	45
4	60

A pattern rule is:
Multiply the number of boxes by 15.

➤ Predict how many books 10 boxes will hold.

To predict the number of books 10 boxes will hold, multiply:
$10 \times 15 = 150$ Ten boxes will hold 150 books.

Try These

1. One concert ticket costs $11.

a) Complete the table to find the cost of 7 tickets.

b) Write a pattern rule for the cost.

_____

c) Predict the cost of 10 tickets. _____

d) Extend the pattern. How many tickets can you buy with $155? _____

Number of Tickets	Cost ($)
1	
2	
3	
4	

Practice

1. Ivo practises the guitar 25 minutes every day.

a) Make a table to show how many minutes Ivo practises in one week.

b) How many minutes does Ivo practise in 10 days?

_____

c) How many minutes will Ivo practise in November?

_____

How many hours is that?

_____

d) How many days will it take Ivo to practise a total of 15 hours? _____

2. One minibus holds 18 students.

a) Make a table to show how many students can ride in 6 minibuses.

b) Write a pattern rule for the number of students.

_____

_____

c) How many students can ride in 10 minibuses?

_____

Stretch Your Thinking

Think about the minibuses in question 2 above.

a) How many students can ride in 25 minibuses? _____

b) How many minibuses are needed for 170 students? _____

UNIT 1

STUDENT BOOK 3 LESSON

Using a Variable to Describe a Pattern

Quick Review

At Home At School

➤ Look at the pattern and the table.

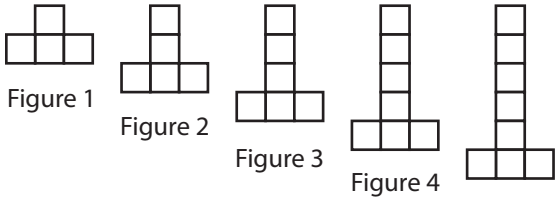


Figure Number	Number of Squares
1	$4 = \mathbf{1} + 3$
2	$5 = \mathbf{2} + 3$
3	$6 = \mathbf{3} + 3$
4	$7 = \mathbf{4} + 3$
5	$8 = \mathbf{5} + 3$

The number of squares is 3 more than the figure number.
Let the **variable** f represent any figure number:
Number of squares: $f + 3$
$f + 3$ is an **expression**. It represents the pattern in the number of squares.

Try These

1. For the pattern below:

a) Complete the table.

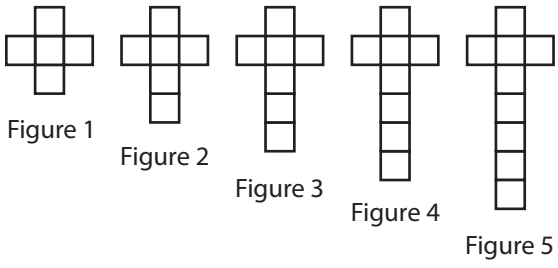


Figure Number	Number of Squares

b) Write an expression to represent the pattern in the numbers of squares.

_____

_____

Practice

1. For the pattern below:

a) Complete the table.

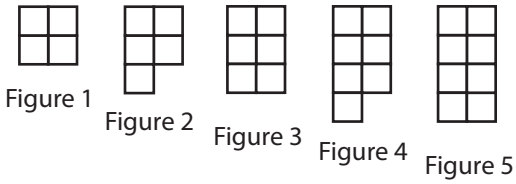


Figure Number	Number of Squares

b) Write an expression to represent the pattern in the number of squares.

_____

c) Find the number of squares in the 10th figure. _____

2. For each table, write an expression for the number of dots in any figure.

a)

Figure Number	Number of Dots
1	7
2	8
3	9
4	10
5	11

b)

Figure Number	Number of Dots
1	2
2	3
3	4
4	5
5	6

_____ _____

3. **a)** Write an expression for the number pattern.
11, 12, 13, 14, 15, 16, . . . _____

b) Write the next 5 terms in the pattern. _____

Stretch Your Thinking

Find the 50th term in each pattern in question 2 above.

a) _____ **b)** _____

UNIT 1

STUDENT BOOK 5 LESSON

Using a Variable to Write an Equation

Quick Review

At Home At School

Sometimes we write an equation to help us solve a problem.
We use a letter variable to represent what we do not know.

Sho spent 24 hours fishing this week.
He fished for 6 hours each day.
How many days did Sho go fishing?

Let d represent the number of days Sho went fishing.
Here are 2 equations we can write:

- We know that:
  6 hours $\times$ number of days fishing = total number of hours
  $6 \times d = 24$ or $6d = 24$
- We know that:
  Number of days fishing = total number of hours $\div$ 6
  $d = 24 \div 6$

Try These

Write an equation for each question.

1. Kiki caught 16 salmon.
She caught 7 on Tuesday and the rest on Thursday.
How many salmon did Kiki catch on Thursday? _____

2. David counted 45 walruses basking in the sun.
This was 3 times as many walruses as he saw last week.
How many walruses did David see last week? _____

3. Candice built 4 models with building blocks.
Each model had the same number of blocks.
Altogether, Candice used 96 building blocks.
How many blocks did she use for each model? _____

Practice

Write two equations for each question.

1. Olivia's family drove to Yellowknife, a distance of about 620 km.
They drove 376 km the first day. How much farther did they have to go?

_____

_____

2. Tameko had $165. He spent $133 on a new pair of ski boots. How much money did Tomeko have left?

_____

_____

3. For gymnastics class, 72 children signed up. The children were put into teams of 8. How many teams were there?

_____

_____

4. A full bottle of water fills 6 glasses. How many bottles will serve 42 people?

_____

_____

5. Vassiliki and Gyamfi made 42 dream catchers.
That was twice as many dream catchers as Petra and Yao made.
How many dream catchers did Petra and Yao make?

_____

_____

Stretch Your Thinking

Write a word problem you can solve by writing an equation.
Write as many equations as you can for your problem.

_____

_____

_____

UNIT 1

STUDENT BOOK 6 LESSON

Solving Equations Involving Addition and Subtraction

Quick Review

At Home At School

Libby makes 42 squares for a new quilt.
She needs 70 squares altogether.
How many more squares must Libby make?

Let s represent the number of squares Libby has to make.
One equation is: $70 = 42 + s$

Solve the equation:
Which number do we add to 42 to get 70?
Subtract to find out: $70 - 42 = 28$
So, $s = 28$

$s = 28$ is the solution to the equation.

Libby must make 28 more squares.

Try These

1. Solve each equation.

a) $18 = m + 4$ _____

b) $20 = y + 14$ _____

c) $37 = p - 4$ _____

d) $53 - d = 37$ _____

2. Write an equation. Then solve.

a) Eli buys 36 bottles of water. He drinks 15 bottles.
How many bottles are left?

_____

_____

b) Sandra received 41 e-mails this week. Sandra received 73 e-mails altogether in two weeks. How many e-mails did Sandra receive last week?

_____

_____

Practice

1. Solve each equation.

a) $43 = h + 4$ _____ **b)** $27 - q = 13$ _____

c) $58 = 94 - n$ _____ **d)** $76 = 23 + b$ _____

2. For each equation in question 1, write a story problem that could be solved by using the equation.

a) _____

_____

b) _____

_____

c) _____

_____

d) _____

_____

3. Write as many equations as you can for this problem. Then solve each equation.

Together Olga and Josef have 43 cousins. Josef has 16 cousins. How many cousins does Olga have?

_____

_____

Stretch Your Thinking

Write a story problem that could be solved by using this equation:
$58 = f - 17$.

_____

_____

_____

UNIT 1

STUDENT BOOK 7 LESSON

Solving Equations Involving Multiplication and Division

Quick Review

At Home At School

Kasia buys 8 tickets for a lacrosse game.
Altogether the tickets cost $96.
What is the cost of 1 ticket?

Let f represent the cost of 1 ticket.
Here are 2 equations we can write and solve.

➤ $f = 96 \div 8$
$96 \div 8 = 12$
So, $f = 12$

➤ $96 = 8f$
$8 \times 12 = 96$
So, $f = 12$

One ticket costs $12.

Try These

1. Solve each equation.

a) $5p = 35$ _____

b) $5p = 50$ _____

c) $35 = 7m$ _____

d) $48 = 6k$ _____

e) $m = 24 \div 3$ _____

f) $55 \div c = 11$ _____

g) $h = 36 \div 6$ _____

h) $28 \div d = 4$ _____

i) $49 = 7m$ _____

j) $b = 72 \div 9$ _____

2. Write an equation. Then solve.

Roger collected 6 baskets of delicious apples.
Each basket held 12 apples. How many apples did Roger collect?

_____

_____

Practice

1. Write an equation. Solve the equation to solve the problem.

a) Ye-Li bought an album to display her 96 hockey cards.
She put 8 cards on each page. How many pages did Ye-Li fill?

_____

b) Katy sold 13 tickets for the harvest dance. Madhir sold twice as many tickets as Katy. How many tickets did Madhir sell?

_____

c) It took Marcello 3 hours to walk 12 km.
About how far did Marcello walk each hour?

_____

d) It took a work crew 3 days to pave 24 km of highway.
About how much of the highway did the crew pave each day?

_____

2. **a)** Write a story problem that could be solved by using this equation:
$m \div 6 = 5$.

_____

_____

b) Solve the problem in part a.

_____

_____

Stretch Your Thinking

Write an equation. Write a story problem that can be solved by solving the equation.

_____

_____

_____

UNIT 2

STUDENT BOOK 1 LESSON

Numbers to 100 000

Quick Review

At Home At School

- 10 000 is 10 times as great as 1000.
- 10 000 is 100 times as great as 100.
- 10 000 is 1000 times as great as 10.
- 10 000 is 10 000 times as great as 1.

A place-value chart shows the values of the digits in a number. As you move to the left each place value is 10 times as great as the place value before.

Ten Thousands	Thousands	Hundreds	Tens	Ones
5	2	6	3	5
↑	↑	↑	↑	↑
50 000	2000	600	30	5

Try These

1. Find the number of tens in:

a) 10 _____ **b)** 100 _____ **c)** 1000 _____ **d)** 10 000 _____

2. Find the number of hundreds in:

a) 100 _____ **b)** 1000 _____ **c)** 10 000 _____ **d)** 100 000 _____

3. Find the number of thousands in:

a) 1000 _____ **b)** 10 000 _____ **c)** 100 000 _____

4. **a)** How many tens are there in 30 000? _____

b) How many hundreds are there in 30 000? _____

c) How many thousands are there in 30 000? _____

5. Use only the digits 2, 5, and 9.
Write a number greater than 50 000. _____

Practice

1. How many of each would make 7000?

a) ones _____ **b)** tens _____ **c)** hundreds _____ **d)** thousands _____

2. How many of each would make 60 000?

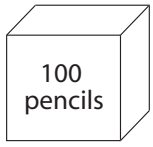
a) tens _____ **b)** hundreds _____

c) thousands _____ **d)** ten thousands _____

3. For each number below, how many packages of pencils will there be?

a) 100 _____ **b)** 1000 _____

c) 10 000 _____ **d)** 100 000 _____



4. Santana packs 100 booklets into each box.
Find the number of boxes Santana will need for:

a) 1000 booklets _____ **b)** 3000 booklets _____ **c)** 13 000 booklets _____

d) 40 000 booklets _____ **e)** 800 booklets _____ **f)** 11 000 booklets _____

5. How many of each would make $90 000?

a) $100 bills _____ **b)** $10 bills _____ **c)** loonies _____

6. Sylvester earns $100 a month working at the car wash.
How many months will it take Sylvester to earn $1000? _____

7. How many centimetres of string would you have for each length?

a) 6 m of string _____ **b)** 9 m of string _____

c) 15 m of string _____ **d)** 23 m of string _____

8. Fergus bought 28 booklets of stamps. Each booklet had 10 stamps. How many stamps did Fergus buy? _____

Stretch Your Thinking

How long, in centimetres, would a line of 1000 Base Ten rods be? Explain.

_____

_____

UNIT 2

STUDENT BOOK 2 LESSON

Exploring One Million

Quick Review

At Home At School

➤ One **million** is 1000 thousands.
Here are some benchmarks for 1 million.

1 000 000 s is about 12 days.

1 000 000 cm = 10 000 m

1 000 000 dimes = $100 000

1 000 000 days is about 2740 years.

Try These

Use a calculator when it helps.

1. Suppose you save $100 a month. How many months would it take you to save $1 million?

_____

2. In its lifetime, a ladybug can eat about 50 000 aphids.
How many ladybugs would it take to eat about 1 million aphids?

_____

3. How many days would it take to walk 1 million metres if you walked about 4000 m per day?

_____

Practice

1. Are there more than 1 million or less than 1 million:

a) grains of sand on a beach? _____

b) books in your classroom? _____

c) blades of grass on a golf course? _____

2. How many of each would make $1 million?

a) $100 bills _____ **b)** $50 bills _____ **c)** $20 bills _____

d) $10 bills _____ **e)** $5 bills _____ **f)** toonies _____

g) quarters _____ **h)** dimes _____ **i)** nickels _____

3. Suppose you read 1000 pages a month. How long would it take you to read 1 million pages?

_____

4. How many boxes of paper clips would you need to get each number?

a) 10 000 _____ **b)** 100 000 _____

c) 500 000 _____ **d)** 1 000 000 _____

5. **a)** Suppose 1 bamboo skewer is about 30 cm long. How many skewers would it take to make a line 1 million centimetres long?

_____

b) How long would the line be in m? _____

Stretch Your Thinking

Do you think many people live to be 1 million hours old? Explain how you know.

_____

_____

_____

UNIT 2

STUDENT BOOK 3 LESSON

Representing Numbers

Quick Review

At Home At School

Here are some ways to represent the number 987 648:

➤ Use a place-value chart.

Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
9	8	7	6	4	8
↑	↑	↑	↑	↑	↑
900 000	80 000	7000	600	40	8

➤ Use **expanded form**.

987 648 = (9 x 100 000) + (8 x 10 000) + (7 x 1000) + (6 x 100) + (4 x 10) + (8 x 1)

= 900 000 + 80 000 + 7000 + 600 + 40 + 8

➤ Use words.

987 648 is nine hundred eighty-seven thousand six hundred forty-eight.

➤ Use standard form.

987 648 is written in standard form.

Try These

1. Record each number in the place-value chart.

a) 584 628 **b)** 193 485 **c)** 76 324 **d)** 809 241

	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
a)						
b)						
c)						
d)						

Practice

1. Write each number in expanded form.

a) 27 254 _____

b) 856 029 _____

c) 613 875 _____

2. Write each number in question 1 in words.

a) _____

b) _____

c) _____

3. Write each number in standard form.

a) thirty-six thousand two hundred eight _____

b) 300 000 + 20 000 + 5000 + 300 + 40 + 4 _____

4. Write the values of each underlined digit.

a) 5<u>7</u>5 184 _____ **b)** <u>8</u>74 372 _____ **c)** 105 <u>6</u>28 _____

5. Use the number in the box. Write the digit in the place named.

976 245

a) ten thousands ____ **b)** tens ____ **c)** hundreds ____

d) hundred thousands ____ **e)** ones ____ **f)** thousands ____

Stretch Your Thinking

Represent and describe the number 791 284 in as many ways as you can.

_____

_____

_____

_____

UNIT 2

STUDENT BOOK 4 LESSON

Estimating Sums

Quick Review

At Home At School

Here are some strategies for estimating a sum.
To estimate 41 376 + 20 443:

➤ Use **front-end rounding**:
41 376 + **2**0 443 is about 40 000 + 20 000 = 60 000.

To get a closer estimate, adjust the front-end estimate:
41 376 + **20** 443 is about 41 000 + 20 000 = 61 000.

➤ Use **compatible numbers**:
Write 41 376 + 20 443 as:
41 300 + 20 400 = 61 700

➤ To estimate 4365 + 2934 + 8223 + 3785:
Use front-end rounding:
4000 + 2000 + 8000 + 3000 = 17 000

To adjust the estimate, use **compensation**:
4365 + 2934 + 8223 + 3785
↓ ↓ ↓ ↓
4000 + 3000 + 8000 + 4000 = 19 000

Try These

Estimate each sum. Show your work.

1. a) 2893 + 6142 _____

b) 2005 + 3941 _____

c) 6734 + 985 _____

d) 1762 + 4827 + 3995 + 2042 _____

2. a) Estimate: 8247 + 9468 _____

b) Use compensation to get a closer estimate.
_____

Practice

Play this game with a partner.
Take turns.

- ➤ Circle 2 numbers in the box.
- ➤ Use a calculator to add the numbers you circled.
- ➤ Use the chart to find how many points you get.
- ➤ Continue to play until all the numbers have been used.

Where Sum Falls	Points You Score
10 000 – 14 000	1
14 000 – 18 000	2
18 000 – 22 000	3
22 000 – 26 000	4

9004	5246			8312
10 356		6084		
	6524		7642	14 932
5285		11 004		
	8601			10 414
			10 391	
10 323				
	11 002	9734		8205
			7602	

Stretch Your Thinking

The estimated sum of two numbers is 20 000.
What might the numbers be? Give two different answers.

_____

_____

UNIT 2

STUDENT BOOK 5 LESSON

Using Benchmarks to Estimate

Quick Review

At Home At School

To write an estimate for the number 17 823, you can find the closest benchmark:

In thousands: **17** 823 is between **17** 000 and **18** 000.
It is closer to 18 000.
So, an estimate for 17 823 is 18 000.

In hundreds: 17 **8**23 is between 17 **800** and 17 **900**.
It is closer to 17 800.
So, a closer estimate for 17 823 is 17 800.

In tens: 17 8**2**3 is between 17 8**20** and 17 8**30**.
It is closer to 17 820.
So, a very close estimate for 17 823 is 17 820.

Try These

1. Estimate to the nearest thousand.

a) 5846 _____ **b)** 24 237 _____ **c)** 59 300 _____

d) 43 594 _____ **e)** 6147 _____ **f)** 68 946 _____

2. Estimate to the nearest hundred.

a) 8426 _____ **b)** 27 729 _____ **c)** 2845 _____

d) 96 324 _____ **e)** 57 691 _____ **f)** 4556 _____

3. Estimate to the nearest ten.

a) 1582 _____ **b)** 6928 _____ **c)** 68 793 _____

d) 5446 _____ **e)** 37 284 _____ **f)** 6379 _____

4. Write an estimate for 15 941 to the nearest:

a) thousand _____ **b)** hundred _____ **c)** ten _____

Practice

1. Write 3 numbers for which 9000 is an estimate.

_____ _____ _____

2. Write 3 numbers for which 27 800 is an estimate.

_____ _____ _____

3. Write 3 numbers for which 84 760 is an estimate.

_____ _____ _____

4. Sanjaya is buying bottles of water for his boy scout troop.
There are 38 scouts in the troop. Bottles of water are sold in packs of 6.
How many 6-packs should Sanjaya buy so that each boy gets 1 bottle? Explain.

_____

_____

_____

_____

5. The 2001 population of Iqaluit was 5236.
Find the closest benchmark for each:

in thousands _____ in hundreds _____ in tens _____

6. The world record for the largest collection of bookmarks is 71 235 bookmarks.
Find the closest benchmark for each:

a) in thousands _____ **b)** in hundreds _____

c) in tens _____

7. Kevin Cook has a collection of 11 097 dice.
Write the closest benchmark for this number in hundreds and in tens.

_____ _____

Stretch Your Thinking

Write a number that has the same estimate when using benchmarks in thousands and in hundreds. _____
How did you find your number? _____

_____

_____

UNIT 2

STUDENT BOOK 6 LESSON

Estimating Differences

Quick Review

At Home At School

Here are some strategies for estimating a difference.

➤ To estimate 6702 – 3494:
Use front-end rounding.
6702 – **3**494 is about 6000 – 3000 = 3000.

To get a closer estimate, look at the last 3 digits of each number.
702 is about 700.
494 is about 500.
700 – 500 = 200
Add 200 to the estimate of 3000: 3000 + 200 = 3200
So, 6702 – 3494 is about 3200.

➤ To estimate 5707 – 212:
Use compatible numbers.
5707 is close to 5712;
then, 5712 – 212 = 5500
Or, 212 is close to 207;
then, 5707 – 207 = 5500

➤ To estimate 3284 – 1935:
Estimate each number to the closest 1000: 3000 – 2000 = 1000
To get a closer estimate, estimate each number to the closest hundred:
3300 – 1900 = 1400

Try These

1. Estimate each difference. Use any strategy you wish.

a) 6842 – 439 _____

b) 9527 – 2476 _____

c) 7654 – 1235 _____

d) 7024 – 891 _____

e) 4593 – 2861 _____

f) 3782 – 422 _____

2. Use front-end rounding to estimate each difference.

a) 2936 – 481 _____

b) 8236 – 3719 _____

Practice

1. Use front-end rounding to estimate each difference.

a) 3842 – 2137 _____

b) 8204 – 938 _____

c) 7934 – 4836 _____

d) 7835 – 5934 _____

2. Use compatible numbers to estimate each difference.

a) 7634 – 5842 _____

b) 8378 – 167 _____

c) 9788 – 2473 _____

d) 5602 – 410 _____

3. Jennah has 1250 flyers to deliver. So far, she has delivered 527. About how many flyers does Jennah still have to deliver?

_____

4. Use the data in the table.
Estimate each difference.

a) About how many more tickets were sold on Friday than on Monday? _____

b) About how many more tickets were sold on Wednesday than on Tuesday? _____

c) About how many more tickets were sold on Saturday than on Thursday? _____

Tickets Sold This Week

Day	Number Sold
Monday	964
Tuesday	709
Wednesday	1432
Thursday	1031
Friday	1936
Saturday	2262

5. Toby estimated that 3676 – 493 was 3100. Was Toby's estimate high or low? Which estimation strategy do you think Toby used?

_____

_____

Stretch Your Thinking

Two 4-digit numbers have a difference of about 1900.
What might the two numbers be?

_____

UNIT 2

STUDENT BOOK 7 LESSON

Using Estimation to Check Answers

Quick Review

At Home At School

➤ Here is one way to add: 3510 + 2637

3000 + 2000 = 5000
500 + 600 = 1100
10 + 37 = 47
6147

To check this sum is reasonable, you can use estimation.
Compensate by rounding one number up and the other number down:
3510 rounds *down* to 3500.
2637 rounds *up* to 2700.
3500 + 2700 = 6200.
Since 6200 is close to 6147, the answer is reasonable.

➤ Here is one way to subtract: 4760 – 2496
Count on from 2496 to 4760.

So, 4760 – 2496 = 2264
To check this difference is reasonable, estimate: 4760 – 2460 = 2300
2300 is close to 2264, so the answer is reasonable.

Try These

1. Add or subtract. Estimate to check. Show your thinking.

a) 3472 + 5836

b) 5279 – 3518

Practice

Solve each problem. Estimate to check your answers are reasonable.
Show your work.

1. Marina collected 635 acorns.
Urvashi collected 426.

a) Suppose Marina and Urvashi combined their collections.
How many acorns would there be?

b) How many more acorns did Marina collect than Urvashi?

2. The CN Tower in Toronto has 1776 steps. The Menara Tower in Kuala Lumpur has 2058 steps. How many more steps than the CN Tower does the Menara Tower have?

3. Simon is a transport truck driver. Last week, Simon drove 6237 km. This week he drove 4117 km. How far did Simon drive in the 2 weeks?

Stretch Your Thinking

Use some of the data in the table to write a subtraction problem. Solve the problem. Estimate to check your answer.

Depths of Ocean Trenches

Trench	Depth (m)
Mariana	10 911
Puerto Rico	9 220
Yap	8 527

UNIT 3

STUDENT BOOK 1 LESSON

Patterns in Multiplication and Division

Quick Review

At Home At School

Here are some strategies to help you multiply and divide.

➤ Skip count up or down from a known fact to multiply.

- To find 9×7:
  Start with: $7 \times 7 = 49$
  $9 \times 7 = 49 + 7 + 7$
  $= 63$
  So, $9 \times 7 = 63$
- To find 6×8:
  Start with: $8 \times 8 = 64$
  $6 \times 8 = 64 - 8 - 8$
  $= 48$
  So, $6 \times 8 = 48$

➤ Use related multiplication facts to divide.

- To find $56 \div 7$:
  Think: $7 \times \mathbf{8} = 56$
  So, $56 \div 7 = 8$
- To find $72 \div 8$:
  Think: $8 \times \mathbf{9} = 72$
  So, $72 \div 8 = 9$

Try These

1. Multiply.

a) $9 \times 8 =$ _____ **b)** $4 \times 6 =$ _____ **c)** $7 \times 6 =$ _____

d) $6 \times 7 =$ _____ **e)** $5 \times 8 =$ _____ **f)** $8 \times 7 =$ _____

2. Divide.

a) $72 \div 9 =$ _____ **b)** $16 \div 2 =$ _____ **c)** $81 \div 9 =$ _____

d) $36 \div 4 =$ _____ **e)** $63 \div 9 =$ _____ **f)** $35 \div 5 =$ _____

3. Write a related multiplication fact for each division.

a) $64 \div 8$ _____ **b)** $42 \div 7$ _____

c) $27 \div 3$ _____ **d)** $30 \div 6$ _____

4. Write as many related facts as you can for each set of numbers.

a) 6, 7, 42 _____

b) 6, 9, 54 _____

Practice

Play this game with a partner.
You will need:
counters of 2 colours
2 number cubes labelled 4 to 9

Take turns.

- Roll the number cubes and multiply the numbers that come up. Cover the product on the game board with one of your counters.
- The first player to cover 4 products in a vertical, horizontal, or diagonal line wins.

81	32	25	48	20
42	72	49	36	40
54	30	16	64	32
24	56	72	45	81
63	35	28	64	36

Stretch Your Thinking

Write as many division facts as you can that have a quotient of 8.

_____

_____

_____

UNIT 3

STUDENT BOOK 2 LESSON

Other Strategies for Multiplying and Dividing

Quick Review

At Home At School

You can use doubling and repeated doubling to multiply.

➤ Begin with a fact that you know.
To find another fact, double one factor, then double the product.

$3 \times 8 = 24$ or $3 \times 8 = 24$
$6 \times 8 = 48$ $3 \times 16 = 48$

➤ To find 4×9:
You know $2 \times 9 = 18$
So, $4 \times 9 = 18 + 18$
$= 36$

You can use halving and repeated halving to divide.

➤ To find $36 \div 4$:
Think: 4 is 2×2.
So, to divide by 4, I can divide by 2, then divide by 2 again.
$36 \div 2 = 18$ $18 \div 2 = 9$ So, $36 \div 4 = 9$

➤ To find $88 \div 8$:
Think: 8 is 4×2 and 4 is 2×2.
So, to divide by 8, I can divide by 2, then divide by 2, then divide by 2 again.
$88 \div 2 = 44$ $44 \div 2 = 22$ $22 \div 2 = 11$ So, $88 \div 8 = 11$

Try These

1. Use doubling to find each product.

a) 8×7 _____

b) 6×5 _____

c) 9×4 _____

d) 6×7 _____

2. Use halving to divide.

a) $48 \div 4$ _____

b) $24 \div 4$ _____

c) 36 ÷ 4 _____

d) 24 ÷ 8 _____

Practice

1. Multiply. Then find a new fact by doubling the first factor in each pair.

a) 5 × 7 = ___ _____ **b)** 3 × 8 = ___ _____

c) 4 × 9 = ___ _____ **d)** 2 × 16 = ___ _____

2. Use halving or repeated halving to divide.

a) 48 ÷ 4 _____

b) 64 ÷ 8 _____

c) 56 ÷ 8 _____

d) 36 ÷ 4 _____

3. Divide by 2 to find 32 ÷ 8. Show all the steps.

32 ÷ 8 _____

4. Draw an array to show repeated halving to divide.

64 ÷ 8 = _____	80 ÷ 8 = _____

5. How can you use 3 × 7 to find 6 × 7? _____

_____

Stretch Your Thinking

a) Why can you not use halving to find 49 ÷ 7?

_____

b) Which strategy could you use?

_____

UNIT 3

STUDENT BOOK 3 LESSON

Multiplying with Multiples of 10

Quick Review

At Home At School

➤ Use place value to multiply by 10, 100, and 1000.
Find each product: 31 × 10 31 × 100 31 × 1000

31 × 1 ten = 31 tens
31 × 1 hundred = 31 hundreds
31 × 1 thousand = 31 thousands

31 × 1**0** = 31**0**
31 × 1**00** = 31**00**
31 × 1**000** = 31**000**

➤ Use basic facts to multiply by multiples of 10, 100, and 1000.
Find each product: 6 × 400 6 × 4000

You know 6 × 4 = 24
6 × 4 hundreds = 24 hundreds
So, **6** × **4**00 = **24**00

6 × 4 thousands = 24 thousands
6 × **4**000 = **24** 000

➤ Multiply 2 multiples of 10, 100, and 1000.
Find each product: 40 × 20 300 × 60

4 tens × 20 = 80 tens
40 × **20** = **80**0

3 hundreds × 60 = 180 hundreds
300 × **60** = **18 0**00

Try These

1. Multiply.

a) 38 × 10 = _____
38 × 100 = _____
38 × 1000 = _____

b) 73 × 10 = _____
73 × 100 = _____
73 × 1000 = _____

c) 30 × 10 = _____
30 × 100 = _____
30 × 1000 = _____

d) 6 × 9 = _____
6 × 90 = _____
6 × 900 = _____
6 × 9000 = _____

e) 12 × 8 = _____
12 × 80 = _____
12 × 800 = _____
12 × 8000 = _____

f) 9 × 7 = _____
9 × 70 = _____
9 × 700 = _____
9 × 7000 = _____

2. Find each product.

a) 40 × 30 = _____ **b)** 80 × 50 = _____ **c)** 20 × 70 = _____

Practice

1. Multiply.

a) $43 \times 10 =$ _____ **b)** $7 \times 90 =$ _____ **c)** $50 \times 70 =$ _____

$43 \times 100 =$ _____ $7 \times 900 =$ _____ $50 \times 700 =$ _____

$43 \times 1000 =$ _____ $7 \times 9000 =$ _____ $50 \times 7000 =$ _____

2. Find each product.

a) $35 \times 100 =$ _____ **b)** $14 \times 900 =$ _____ **c)** $12 \times 70 =$ _____

d) $17 \times 2000 =$ _____ **e)** $20 \times 80 =$ _____ **f)** $11 \times 8000 =$ _____

3. Find the total value of each set of bills.

a) eighty $10 bills _____ **b)** sixty $20 bills _____

c) seventy $50 bills _____ **d)** nine hundred $100 bills _____

4. A hamster eats 11 g of food a day. How much food does it eat in the month of April? _____

5. Margie packed 80 pamphlets in each of 70 envelopes. How many pamphlets did she pack? _____

6. Tickets to a concert cost $40 each. How much do 90 tickets cost?

_____

7. A theatre has 60 rows of 30 seats. How many seats is that altogether?

_____

Stretch Your Thinking

A payroll clerk writes 20 cheques for $600 and 12 cheques for $400. What is the total amount of the cheques?

_____

_____

UNIT 3

STUDENT BOOK 4 LESSON

Estimating Products to Solve Problems

Quick Review

At Home At School

Here are some strategies to help you estimate products.

➤ Use **compatible numbers**.
Estimate: 27×9
Think: $30 \times 9 = 270$
Or, $27 \times 10 = 270$
Or, $30 \times 10 = 300$

➤ Use compatible numbers and compensation.
Estimate: 48×31
Think: $50 \times 30 = 1500$

When we round one number up and one number down, we have used compensation.

➤ Use **front-end rounding**:
Estimate: 7×316
Think **7** $\times$ **3**00 = 2100

Since 300 is less than 316, then 2100 is an underestimate.

Try These

1. Use compatible numbers to estimate each product.

a) 9×78 _____ **b)** 583×8 _____

c) 62×79 _____ **d)** 82×12 _____

2. Estimate each product.

a) 68×9 _____ **b)** 314×5 _____

c) 7×223 _____ **d)** 8×218 _____

3. Tell if each estimate in question 2 is an overestimate or an underestimate.

a) _____ **b)** _____

c) _____ **d)** _____

Practice

Solve each problem. Show your work.

1. There are 24 marchers in each row.
There are 58 rows of marchers.
About how many marchers are there?

_____

_____

2. Chintana and her family make 48 ookpiks each month.
About how many ookpiks do they make in one year?

_____

_____

3. Each box contains 132 tissues.
About how many tissues are in 18 boxes?

_____

_____

4. The estimated answer to a multiplication question is 5100.
What might the question be?

_____

5. Approximately 380 people visit the children's museum each day.
About how many people visit the children's museum in 7 days?

_____

_____

6. Roy estimated the product of 587×8 to be about 4800.
Which strategy did Roy use?

_____

_____

Stretch Your Thinking

Write a story problem for which an overestimate would be appropriate.

_____

_____

UNIT 3

STUDENT BOOK 5 LESSON

Using Mental Math to Multiply

Quick Review

At Home At School

Here are some strategies for multiplying mentally.

➤ Multiply: 6×18

$6 \times 8 = 48$

$6 \times 10 = 60$

$48 + 60 = 108$

So, $6 \times 18 = 108$

➤ Multiply: 14×15

Half of 14 is 7.

Double 15 is 30.

$7 \times 30 = 210$

So, $14 \times 15 = 210$

➤ Multiply: 24×35

$24 = 12 \times 2$

$24 \times 35 = 12 \times 2 \times 35$

$= 12 \times 70$

$= 840$

So, $24 \times 35 = 840$

➤ Multiply: 203×6

$200 \times 6 = 1200$

$3 \times 6 = 18$

$1200 + 18 = 1218$

So, $203 \times 6 = 1218$

Try These

1. Multiply. Use mental math.

a) $5 \times 45 =$ _____ **b)** $12 \times 45 =$ _____ **c)** $197 \times 3 =$ _____

d) $18 \times 25 =$ _____ **e)** $2 \times 599 =$ _____ **f)** $14 \times 35 =$ _____

2. Use mental math. Find the product of 16×35 two different ways. Describe the strategies you used.

_____ _____

_____ _____

_____ _____

3. Explain why $28 \times 25 = 7 \times 4 \times 25$.

_____

Practice

1. Use mental math to find each product.

a) $12 \times 25 =$ _____ **b)** $58 \times 26 =$ _____ **c)** $402 \times 8 =$ _____

d) $9 \times 49 =$ _____ **e)** $36 \times 18 =$ _____ **f)** $17 \times 199 =$ _____

2. Use mental math to solve each problem.

a) Emily has 8 books of stickers. Each book has 198 stickers. How many stickers does Emily have?

_____

b) A grocer ordered 26 boxes of oranges. Each box contains 3 dozen oranges. How many oranges did the grocer order?

_____

c) Suppose your heart beats 78 times a minute. How often does it beat in an hour?

_____

3. Use mental math to complete this table.

×	25	16	42
23			
35			
14			
11			

Stretch Your Thinking

Which product is greater, 25×36 or 98×9? How much greater?

_____

_____

UNIT 3

STUDENT BOOK 6 LESSON

Multiplying 2-Digit Numbers

Quick Review

At Home At School

Multiply: 32×24

➤ Here is one way to multiply:

Write each factor in expanded form.
Then write 4 partial products.

$$\begin{aligned} 32 \times 24 &= (30 + 2) \times (20 + 4) \\ &= (30 \times 20) + (30 \times 4) + (2 \times 20) + (2 \times 4) \\ &= 600 + 120 + 40 + 8 \\ &= 768 \end{aligned}$$

➤ Estimate to check if the answer is reasonable:

$$\begin{aligned} 32 \times 24 \text{ is about } 30 \times 25 &= 3 \times 25 \times 10 \\ &= 75 \times 10 \\ &= 750 \end{aligned}$$

Since 750 is close to 768, the answer is reasonable.

Try These

1. Multiply.

a) 46×32 **b)** 74×23 **c)** 14×18 **d)** 53×22

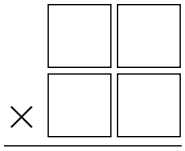
2. Find each product.

a) 64×23 **b)** 94×12 **c)** 82×26 **d)** 34×33

Practice

1. Play this game with a partner.
You will need 10 cards labelled 0 to 9, placed in a paper bag.

- ➤ Each player draws a multiplication grid like this on paper.



- ➤ Take turns to draw a card from the bag.
  On each draw, both players record the digit in any box on their grids.
- ➤ Return the card to the bag after each draw.
- ➤ Continue until all the boxes are filled.
- ➤ Multiply using paper and pencil.
  Check each other's product.
- ➤ The player with the greater product wins a point.
- ➤ Play 5 rounds to determine an overall winner.

2. Solve each problem. Show your work.

a) Bruce jogs a total of 25 km every week.
How many kilometres does he jog in a year?

_____

_____

b) Nya earns $17 a week baby-sitting.
How much does she earn in 12 weeks?

_____

_____

Stretch Your Thinking

Find 2 consecutive 2-digit numbers whose product is 812.

_____

UNIT 3

STUDENT BOOK 7 LESSON

Estimating Quotients to Solve Problems

Quick Review

At Home At School

Here are some strategies you can use to estimate quotients.

➤ Estimate: 984 ÷ 5
Look for **compatible numbers**.
984 is close to 1000.
1000 is 10 hundreds.
10 hundreds ÷ 5 = 2 hundreds
= 200
984 ÷ 5 is about 200.
This is an overestimate because 1000 > 984.

Compatible numbers are numbers that are easy to use mentally.

➤ Estimate: 364 ÷ 5
Use front-end rounding.
364 ÷ 5 is about 300 ÷ 5.
30 ÷ 5 = 6, so 300 ÷ 5 = 60
The estimate is low.
To get a closer estimate, look at the first 2 digits of the dividend:
364 ÷ **5**
35 ÷ 5 = 7, so 36 ÷ 5 is close to 7.
So, 364 ÷ 5 is about 350 ÷ 5 = 70

Try These

1. Estimate each quotient.

a) 273 ÷ 5

_____

b) 942 ÷ 6

_____

c) 470 ÷ 8

_____

d) 984 ÷ 3

_____

e) 789 ÷ 9

_____

f) 447 ÷ 4

_____

Practice

1. Estimate each quotient.

a) 351 ÷ 7 _____

b) 429 ÷ 5 _____

c) 632 ÷ 8 _____

d) 472 ÷ 6 _____

e) 209 ÷ 4 _____

f) 221 ÷ 3 _____

g) 994 ÷ 5 _____

h) 884 ÷ 9 _____

2. Sydney has 893 collector's coins. He wants to mount them in groups of 9.

About how many groups can he make? _____

3. Bruno travelled 785 km in one week.

About how far did he travel each day? _____

4. Maude made 140 g of trail mix.

About how much can she serve to each of 8 guests? _____

5. About how many Saturdays are there in 1 year? _____

6. One hundred ninety-one children signed up for basketball.

About how many teams of 9 can the coaches make? _____

7. Crayons are packaged in boxes of 8.

About how many boxes can be filled with 250 crayons? _____

Stretch Your Thinking

Arnold estimated that 847 ÷ 8 is about 100. Was his estimate high or low? Explain.

_____

_____

_____

UNIT 3

STUDENT BOOK 8 LESSON

Dividing a 3-Digit Number by a 1-Digit Number

Quick Review

At Home At School

To divide 158 by 4, you can subtract multiples of 4.

Choose any multiple of 4 less than 158. Start with 40.

Subtract 40 from 158.

$4\overline{)158}$

$-\ 40 \quad 10$

118

Then subtract 80.

$4\overline{)158}$

$-\ 40 \quad 10$

118

$-\ 80 \quad 20$

38

Then subtract 36.

$4\overline{)158}$

$-\ 40 \quad 10$

118

$-\ 80 \quad 20$

38

$-\ 36 \quad 9$

2

Add the side numbers.

$4\overline{)158}$

$-\ 40 \quad 10$

118

$-\ 80 \quad 20$

38

$-\ 36 \quad 9$

2

$10 + 20 + 9 = 39$

$4\overline{)158}$ is 39 with 2 left over.

Try These

1. Divide. Show your work.

a) $3\overline{)246}$ **b)** $5\overline{)187}$ **c)** $4\overline{)861}$ **d)** $6\overline{)358}$

_____ _____ _____ _____

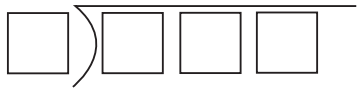
Practice

1. Divide.

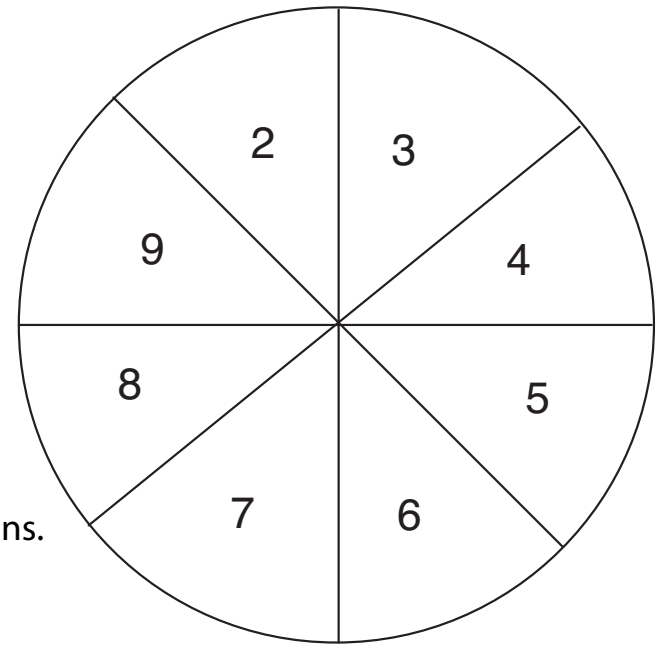
a) 467 ÷ 3 = _____ **b)** 184 ÷ 8 = _____ **c)** 462 ÷ 9 = _____

2. Play this game with a partner.
You will need:
1 Base Ten unit cube or other small object

➤ Both players draw a division grid like this one:



➤ Players take turns dropping the cube onto the numbered circle with their eyes closed. In any box on the grids, both players record the number on which the cube landed.
➤ Continue until all the boxes on the grids are full.
➤ Divide.
The player with the greater answer wins.
Play 5 more games.



Stretch Your Thinking

Suppose you are playing the game above.
Where on your grid should you record a 9? Explain.

_____

_____

UNIT 3

STUDENT BOOK 9 LESSON

Other Strategies for Dividing Whole Numbers

Quick Review

At Home At School

Here are 2 ways to divide 587 by 4.

➤ Use place value.

Divide the hundreds.

$$\begin{array}{r} 1 \\ 4\overline{)587} \\ -4 \\ \hline 1 \end{array}$$

Divide the tens.

$$\begin{array}{r} 14 \\ 4\overline{)587} \\ -4\downarrow \\ \hline 18 \\ -16 \\ \hline 2 \end{array}$$

Divide the ones.

$$\begin{array}{r} 146 \\ 4\overline{)587} \\ -4\downarrow \\ \hline 18 \\ -16\downarrow \\ \hline 27 \\ -24 \\ \hline 3 \end{array}$$

$587 \div 4 = 146$ R3

➤ Use mental math.

$587 \div 4 = 400 + 100 + 87$

$400 \div 4 = 100$ $\quad 100 \div 4 = 25$ $\quad 87 \div 4 = 21$ R3

So, $587 \div 4 = 100 + 25 + 21 + R3$

$= 146$ R3

To check, multiply 146 by 4, then add 3.

$146 \times 4 = 584$

$584 + 3 = 587$ ← Since this is the dividend, the answer is correct.

Try These

1. Divide.

a) $6\overline{)763}$ **b)** $4\overline{)253}$ **c)** $5\overline{)356}$ **d)** $2\overline{)128}$

e) $3\overline{)568}$ **f)** $7\overline{)147}$ **g)** $8\overline{)593}$ **h)** $9\overline{)604}$

Practice

1. Find each quotient.

a) $6\overline{)463}$ **b)** $8\overline{)589}$ **c)** $5\overline{)248}$

d) $2\overline{)536}$ **e)** $7\overline{)490}$ **f)** $4\overline{)632}$

g) $3\overline{)862}$ **h)** $9\overline{)413}$ **i)** $7\overline{)300}$

j) $3\overline{)584}$ **k)** $6\overline{)713}$ **l)** $8\overline{)623}$

2. In the cafeteria, students sit at tables for 8.

How many tables are needed for 563 students?

_____

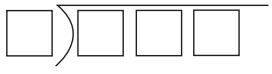
3. A ticket seller sold $272 worth of movie tickets.

How many tickets did she sell if each ticket cost $8?

_____

Stretch Your Thinking

Use the digits 4, 6, 7, and 8 to make the greatest quotient with no remainder.



UNIT 3

STUDENT BOOK 10 LESSON

Solving Problems

Quick Review

At Home At School

➤ Maxine knits mittens and stocking caps and sells them at the market.
She charges $8 for a cap and $9 for a pair of mittens.
Last winter, Maxine's sales totalled $449.
She sold 25 pairs of mittens. How many caps did she sell?

First, find out how much she took in for mittens.
Multiply: $9 \times 25 = 225$

Maxine took in $225 for mittens.

Next, find out how much Maxine took in for the caps.
Subtract: $449 - 225 = 224$

Maxine took in $224 for caps.

Finally, find out how many caps Maxine sold.
Divide: $224 \div 8 = 28$

Maxine sold 28 stocking caps.

Try These

1. Munir worked on a farm for 3 weeks last summer.
The first week, he earned $150. The second week, he earned $24 more than the first week. The third week, he earned $17 less than the second week.
How much money did Munir earn altogether?

_____

_____

_____

2. Pan has 367 marbles. Seventy-eight marbles are green. One hundred thirty-one are red. How many marbles of other colours does Pan have?

_____

_____

Practice

Solve each problem. Show all your work.

1. Lonny uses 12 cups of flour to make 6 batches of cookies.
How much flour will he need to make 18 batches of cookies?

_____

_____

2. Liana packed 24 novels into each of 16 boxes.
She packed 28 spelling books into each of 13 boxes.
How many books did Liana pack?

_____

_____

_____

3. Kiara spent $273 on school clothes. She bought 2 pairs of jeans at $39 each, and 5 tops at $19 each. She spent the rest of the money on a pair of shoes.
How much did Kiara spend on shoes?

_____

_____

_____

_____

Stretch Your Thinking

Gene had 144 hens. He sold 48 of them to Bonny and 16 of them to Mark.
How many hens does Gene have left?

_____

_____

_____

_____

UNIT 4

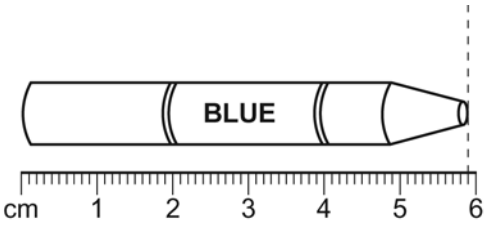
STUDENT BOOK 1 LESSON

Measuring Length

Quick Review

At Home At School

This crayon is about 6 cm long.



To be more precise, you can read the length in millimetres.
The crayon is 59 mm long.

One millimetre is one-tenth of a centimetre.
So, you can say the length in centimetres.

The crayon is 5.9 cm long.
You say: 5 and 9 tenths centimetres

10 mm = 1 cm **So, 1 mm = 0.1 cm**	**100 cm = 1 m** **So, 1 cm = 0.01 m**	**1000 mm = 1 m**

Try These

1. Estimate the length of each line segment to the nearest centimetre.
Then, measure and record the actual length in millimetres and centimetres.

		Estimate (cm)	Length (mm)	Length (cm)
a)	_____			
b)	_____			
c)	_____			

Practice

1. Work with a partner.

You will need:
small objects, such as a pencil, a crayon, a paper clip, a straw, a craft stick
a 30-cm ruler

- ➤ Choose an object.
- ➤ Both of you estimate the object's length to the nearest centimetre.
- ➤ Record your estimates.
- ➤ Measure and record the actual length in millimetres and in centimetres.
- ➤ Repeat with other objects.

Object	Our Estimates (cm)		Actual Length (mm)	Actual Length (cm)

Stretch Your Thinking

Measure and record the width of your hand and your foot.
Complete the chart.

	Width (mm)	Width (cm)
Hand		
Foot		
Difference		

UNIT 4

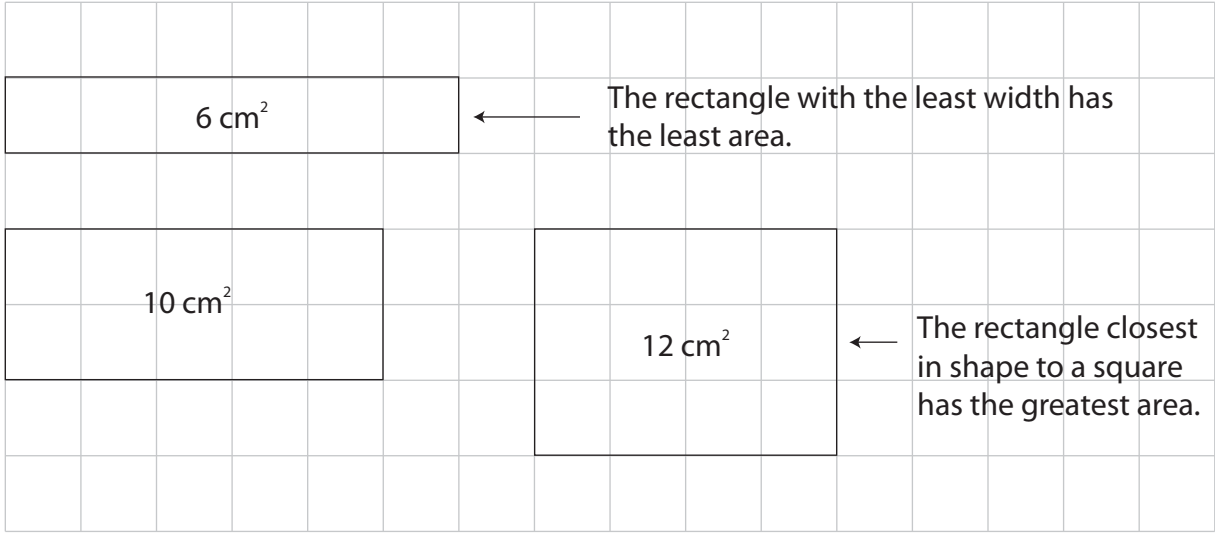
STUDENT BOOK 3 LESSON

Exploring Rectangles with Equal Perimeters

Quick Review

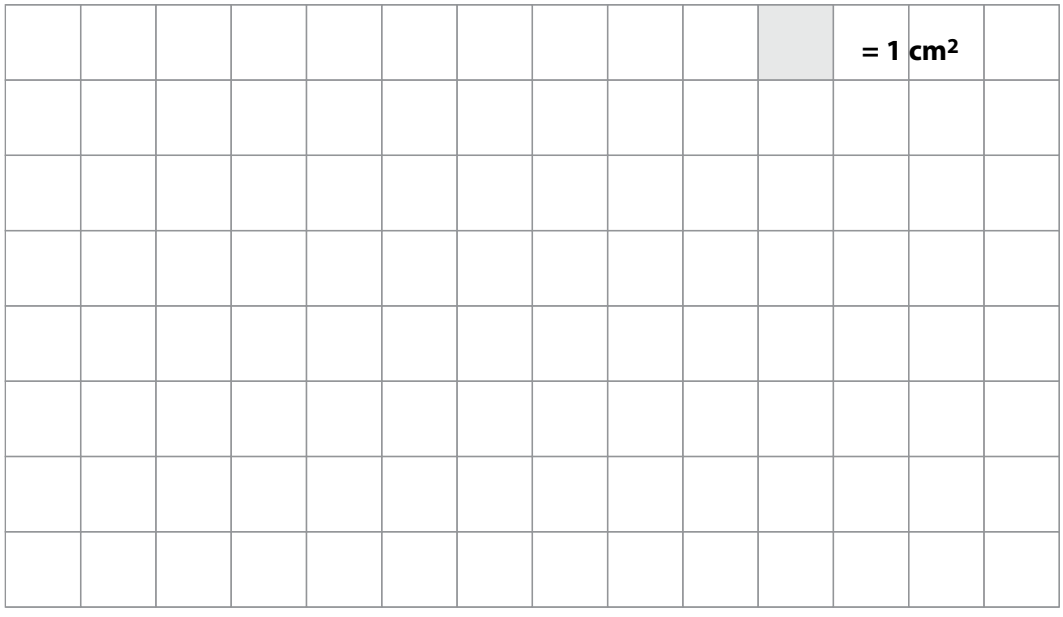
At Home At School

Rectangles with equal perimeters can have different areas.
Each rectangle below has perimeter of 14 cm.



Try These

1. Draw all possible rectangles with a perimeter of 18 cm. Label each rectangle with its area.

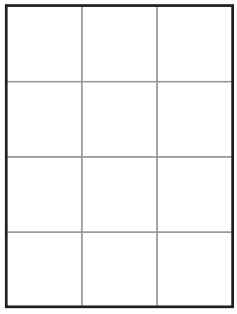


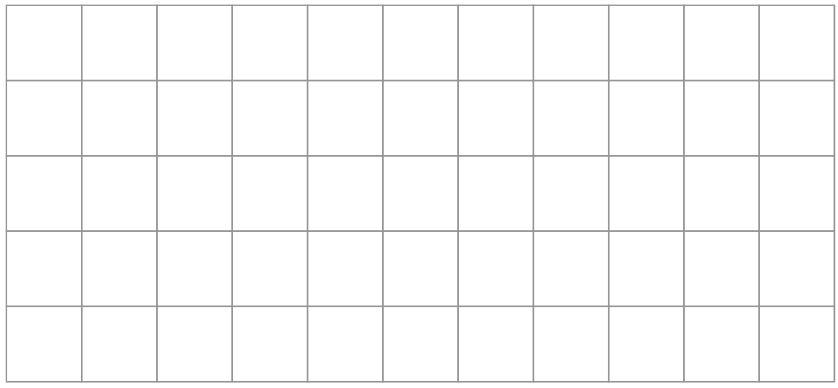
Practice

Find the perimeter and the area of each rectangle.
Then draw another rectangle with the same perimeter.
Record the area of the rectangle you drew.

Each small square has an area of 1 cm^2.

1.



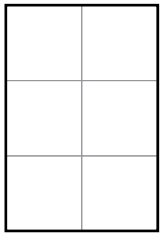


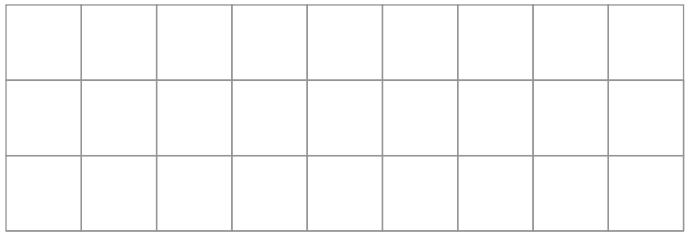
Perimeter = _____

Area = _____

Area = _____

2.





Perimeter = _____

Area = _____

Area = _____

Stretch Your Thinking

Suppose the area of your rectangular garden is 5 m^2.
What is its perimeter? Explain.

_____

_____

UNIT 4

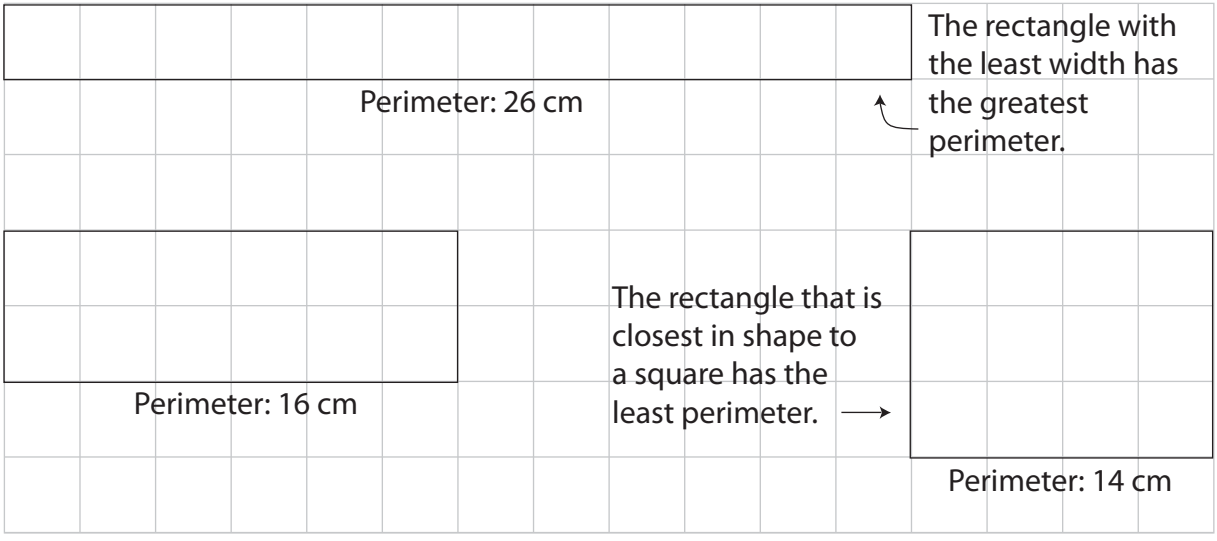
STUDENT BOOK 4 LESSON

Exploring Rectangles with Equal Areas

Quick Review

At Home At School

Rectangles with equal areas can have different perimeters.
Each rectangle below has area 12 cm^2.



Try These

Draw all the possible rectangles with area 16 cm^2.

Practice

1. Draw a rectangle with each area and perimeter.
Label each rectangle with its letter.
A: area 14 cm^2 and perimeter 18 cm; B: area 24 cm^2 and perimeter 20 cm;
C: area 36 cm^2 and perimeter 24 cm; D: area 1 cm^2 and perimeter 4 cm;
E: area 9 cm^2 and perimeter 12 cm

2. The area of a rectangular carpet is 36 m^2.
What is the least perimeter the carpet could have? _____
What is the greatest perimeter the carpet could have? _____

Stretch Your Thinking

Pat needs 48 m of fencing to surround her rectangular rose garden.
What could the area of Pat's garden be? Give as many answers as you can.

_____

_____

UNIT 4

STUDENT BOOK 5 LESSON

Exploring Volume

Quick Review

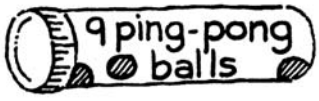
At Home At School

The amount of space inside an object is a measure of its **volume**.
You can find the volume of a container by filling it with identical items, then counting these items.

➤ This box holds 12 donuts.
It has a volume of about 12 donuts.

➤ This box holds 20 floor tiles.
It has a volume of 20 floor tiles.

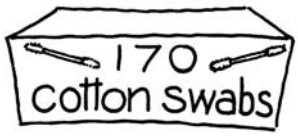
➤ This container holds 9 ping-pong balls.
It has a volume of about 9 ping-pong balls.



Try These

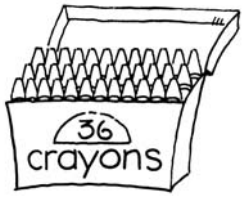
1. What is the volume of each object?

a)



_____

b)



_____

c)

_____

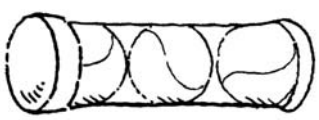
2. Find a small box.

Estimate the volume in Snap Cubes. Estimate: _____

Fill the box to check your estimate. Volume: _____

Practice

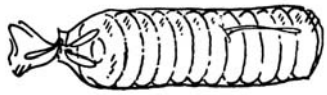
1. What is the volume of each object?

a) 

_____

b) 

_____

c) 

_____

2. Find a small box.
Estimate its volume in green Pattern Blocks.
Fill the box to check your estimate.
Repeat with orange Pattern Blocks.
Record your work in the table.

	Volume
Green Pattern Blocks	
Orange Pattern Blocks	

3. Suppose you fill a box with marbles. Then you fill the same box with ping-pong balls. Would you need more marbles or more ping-pong balls to fill the box? Explain.

_____

_____

4. Which item would you use to get the best measure of the volume of a cracker box: sugar cubes, golf balls, or acorns? Explain.

_____

_____

Stretch Your Thinking

When would you use "about" to describe the volume of a box?
When would you not use "about"?

_____

_____

_____

_____

UNIT 4

STUDENT BOOK 6 LESSON

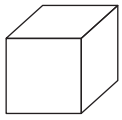
Measuring Volume in Cubic Centimetres

Quick Review

At Home At School

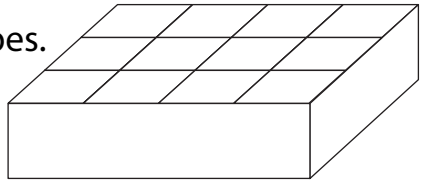
➤ The **volume** of an object is the amount of space inside of it.

The length of each edge of this centimetre cube is 1 cm.

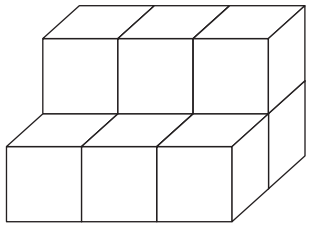


A centimetre cube has a volume of **one cubic centimetre** (**1 cm³**).
We can use centimetre cubes to measure volume.

This box holds 3 rows of 4 cubes, or 12 cubes.
The volume of the box is
12 cubic centimetres, or 12 cm³.



➤ The volume of an object is also the space it occupies. This object has 6 cubes in the bottom layer and 3 cubes in the top layer. The volume is 9 cubic centimetres, or 9 cm³.

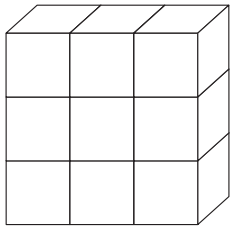


Try These

Use centimetre cubes to help.

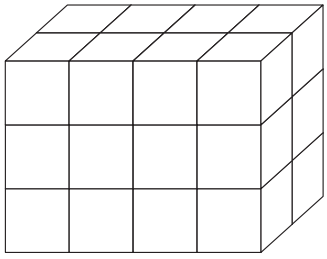
1. Each prism is made with centimetre cubes.
Find the volume of each prism.

a)



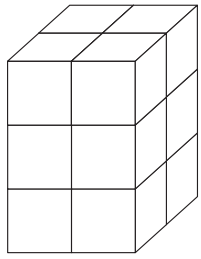
_____

b)



_____

c)



_____

2. Order the prisms in question 1 from least to greatest volume. _____

Practice

1. Use centimetre cubes.
Build 3 different rectangular prisms with a volume of 12 cm^3.
Describe each prism.

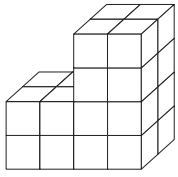
a) _____

b) _____

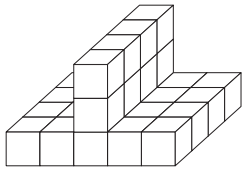
c) _____

2. Each object is made with centimetre cubes.
Estimate the volume of each solid. Then, find each volume.

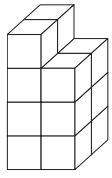
a)



b)



c)



Estimate: _____ Estimate: _____ Estimate: _____

Volume: _____ Volume: _____ Volume: _____

3. Order the objects in question 2 from greatest to least volume. _____

4. How many different rectangular prisms with a volume of 11 cm^3 can you build with centimetre cubes? Explain.

_____

_____

Stretch Your Thinking

Find a small box. Estimate its volume in cubic centimetres.
Use centimetre cubes to find the volume of the box.

a) How did you find the volume of the box?

_____

_____

b) Is the volume exact or approximate? Explain.

_____

_____

UNIT 4

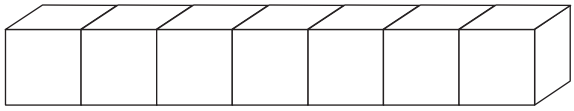
STUDENT BOOK 7 LESSON

Constructing Rectangular Prisms with a Given Volume

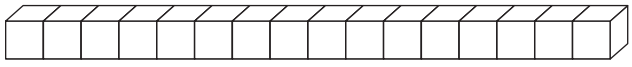
Quick Review

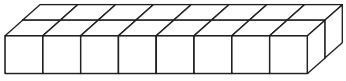
At Home At School

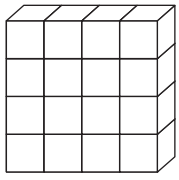
➤ You can make only 1 rectangular prism using 7 centimetre cubes. The volume of this rectangular prism is 7 cm^3.

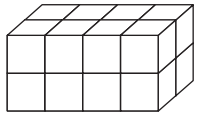


➤ You can make 4 different rectangular prisms with 16 cubes. The volume of each rectangular prism is 16 cm^3.





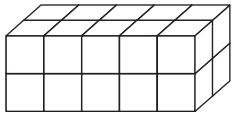




Try These

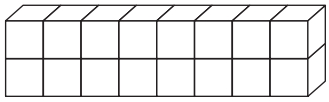
1. These rectangular prisms are made with centimetre cubes. Find the volume of each prism.

a)



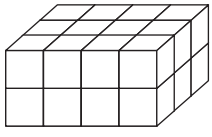
_____

b)



_____

c)



_____

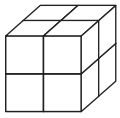
2. How many different rectangular prisms can be made with 10 centimetre cubes? _____

Write the dimensions of each prism.

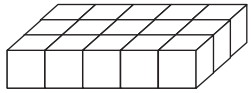
_____

Practice

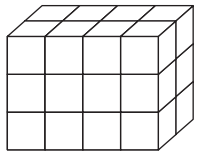
1. These rectangular prisms are made with centimetre cubes.
Find the volume of each prism.

a) 

_____

b) 

_____

c) 

_____

2. Use centimetre cubes.
Build a rectangular prism with each volume.
Record your work in the table.

a) 12 cm^3 **b)** 18 cm^3
c) 11 cm^3 **d)** 8 cm^3

Volume	Length (cm)	Width (cm)	Height (cm)
12 cm^3			
18 cm^3			
11 cm^3			
8 cm^3			

3. Build a rectangular prism with each set of dimensions.
Find the volume of each prism.

Length (cm)	Width (cm)	Height (cm)	Volume (cm^3)
3	2	1	
4	3	3	
6	1	1	
3	2	3	
5	1	2	

4. Vannah built a rectangular prism with 48 centimetre cubes.
She put 16 cubes in each layer.

a) How many layers of cubes does her prism have? _____

b) What are the dimensions of the prism?
Give as many possible answers as you can.

_____

Stretch Your Thinking

Harold built a rectangular prism with 36 centimetre cubes.
What might be the dimensions of his prism? Give as many answers as you can.

_____

_____

_____

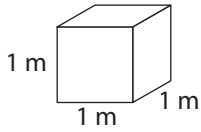
UNIT 4

STUDENT BOOK 8 LESSON

Measuring Volume in Cubic Metres

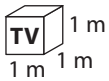
Quick Review

A cube with edge lengths of one metre has a volume of **one cubic metre (1 m³).**

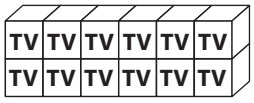


We use cubic metres to measure the volumes of large objects.

This carton is 1 m long, 1 m wide, and 1 m tall.
It has a volume of 1 m³.



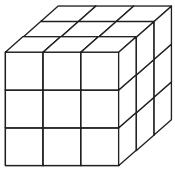
Twelve of these cartons are stacked in 2 layers of 6.
The stack has a volume of 12 m³.



Try These

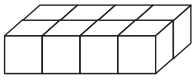
1. Each rectangular prism is built with 1-m cubes.
Find the volume of each prism.

a)



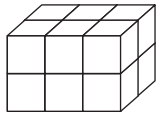
_____

b)



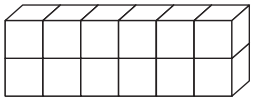
_____

c)



_____

d)



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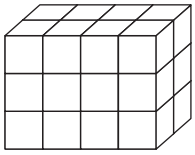
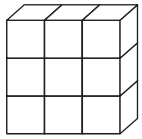
e)



_____

f)



_____

Practice

1. Name 2 objects whose volume is:

a) about 1 m^3 _____ _____

b) greater than 1 m^3 _____ _____

c) less than 1 m^3 _____ _____

2. Jared and Alyssa made a stack of hay bales.
Each bale has a volume of 1 m^3.
They made 3 layers with 6 bales in each layer.

a) What is the volume of the stack? _____
b) How many rows of bales could be in each layer? _____
c) How many bales could be in each row? _____

3. Which unit would you use to measure the volume of each object: cubic centimetre or cubic metre?

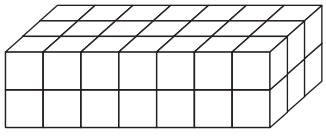
a) a baby's playpen _____

b) a cake mix box _____

c) a storage shed _____

d) a transport truck _____

4. Each rectangular prism is built with 1-m cubes.
Find the volume of each prism.

a) 

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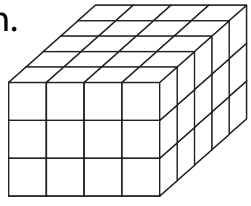
b) 

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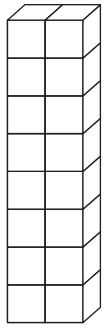
c) 

_____

Stretch Your Thinking

A stack of crates has a volume of 48 m^3.
There are 2 layers in the stack.
How many crates long and wide could each layer be?
Give as many answers as you can.

_____

_____

UNIT 4

STUDENT BOOK 9 LESSON

Exploring Capacity: The Litre

At Home At School

Quick Review

When you measure how much a container holds, you measure its **capacity**.

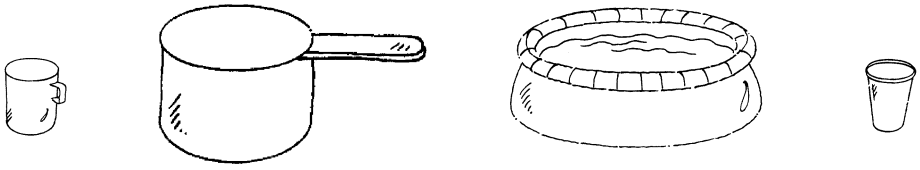
This bottle has a capacity of **one litre (1 L).**
The bottle holds 1 L of water.

One litre fills about 4 glasses.

Here are some other things that are measured in litres.

Try These

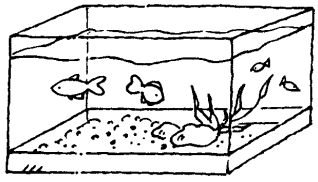
1. Circle the containers that hold more than one litre.



2. Circle the better estimate.

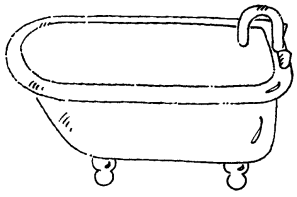
a) 4 L or 40 L

b) 2 L or 20 L



c) 1 L or 50 L

d) 2 L or 200 L



Practice

Solve each problem. Show your work.

1. How many litres of milk will it take to fill:

a) 8 glasses? _____

b) 16 glasses? _____

c) 20 glasses? _____

d) 12 glasses? _____

2. Eva has a 3-L jug of fruit punch.

How many glasses can she fill? _____

3. Each child at the picnic drank 1 glass of juice.
There were 18 L of juice served.

About how many children were at the picnic? _____

4. Dakota's family drinks 4 L of milk a day.

a) How many litres of milk does Dakota's family drink in a week? _____

b) How many litres of milk does Dakota's family drink in the month of April?

_____

5. Which containers hold less than 1 L? Which hold more than 1 L?

a) a mug _____

b) a baby's bottle _____

c) a garbage can _____

d) a rain barrel _____

e) a kitchen sink _____

f) an eyedropper _____

Stretch Your Thinking

Your heart pumps about 5 L of blood a minute.
How many litres of blood does your heart pump in one hour?

_____

UNIT 4

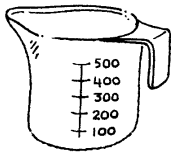
STUDENT BOOK 10 LESSON

Exploring Capacity: The Millilitre

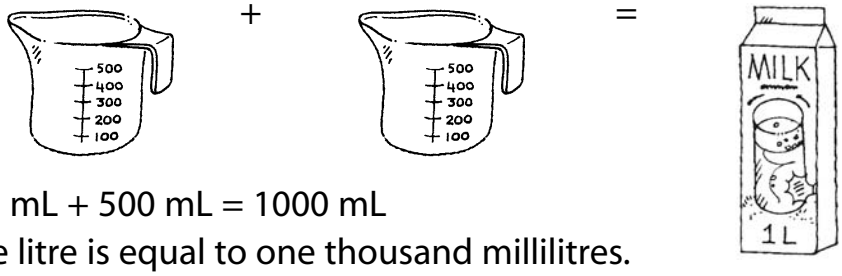
Quick Review

The **millilitre** (mL) is a small unit of capacity.
This teaspoon has a capacity of 5 mL.

This measuring cup has a capacity of 500 mL. It holds 500 mL of water.



It takes 2 of these measuring cups to fill a 1-L container.



500 mL + 500 mL = 1000 mL
One litre is equal to one thousand millilitres.
1 L = 1000 mL

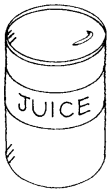
Try These

1. Which unit would you use to measure each capacity: millilitre or litre?

a)

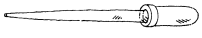
_____

b)



_____

c)



_____

2. Peter drinks 2 L of water each day.
How many millilitres of water does he drink each day?

_____

3. Complete.

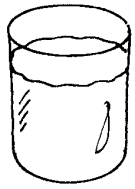
a) 5 L = _____ mL **b)** 2 L = _____ mL **c)** 6 L = _____ mL

d) 3000 mL = _____ L **e)** 7000 mL = _____ L **f)** 1000 mL = _____ L

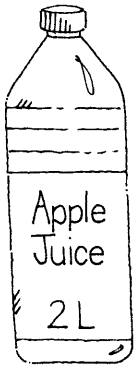
Practice

1. Circle the better estimate.

a) 85 mL or 850 mL **b)** 25 mL or 250 mL **c)** 15 mL or 500 mL



2.



a) Order the capacities of these containers from least to greatest.

_____

b) Which container's capacity is closest to 1 L? _____

3. Which unit would you use to measure each amount: millilitre or litre?

a) the amount of gasoline in a car _____

b) the amount of water in a raindrop _____

c) the amount of nail polish in a bottle _____

d) the amount of water in a swimming pool _____

4. Hunter bought a 1-L bottle of water. He drank 750 mL of the water.

How much water does Hunter have left? _____

Stretch Your Thinking

It takes about 30 mL of jam to make a sandwich. About how many sandwiches could you make with this whole jar?

_____

UNIT 4

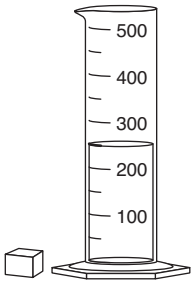
STUDENT BOOK 11 LESSON

Relating Capacity and Volume

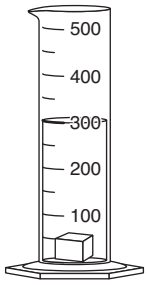
Quick Review

At Home At School

You can find the volume of an object by measuring the amount of water **displaced** or moved by the object.



There are 250 mL of water in the container.



The prism has raised the water level to 300 mL.

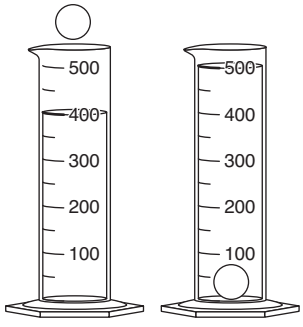
300 mL – 250 mL = 50 mL
The prism displaced 50 mL of water.

1 mL = 1 cm^3
50 mL = 50 cm^3
So, the volume of the prism is 50 cm^3.

Try These

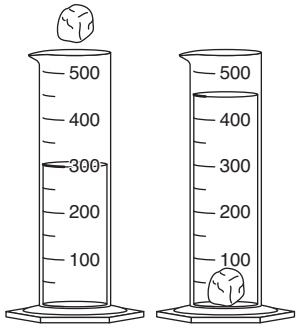
1. What is the volume of each object?

a)



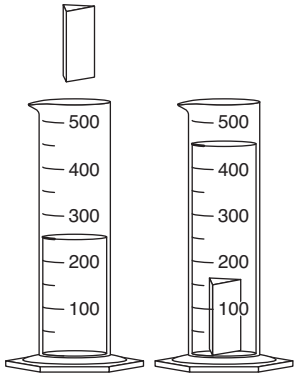
_____

b)



_____

c)



_____

Practice

1. You will need a measuring cup marked in millilitres, water, and 6 objects that will sink.
Find the volume of each object. Complete the chart.

Object	Water Level without Object	Water Level with Object	Amount of Water Displaced	Volume of the Object

2. Order the objects you used in question 1 from least to greatest volume.

_____

_____

_____

Stretch Your Thinking

Nancy filled a measuring cup with water to the 450-mL mark.
She dropped 4 golf balls into the cup.
The water level rose to the 650-mL mark.
What is the volume of one golf ball? Explain.

_____

_____

_____

_____

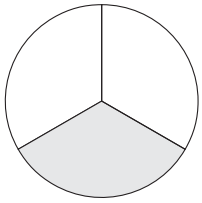
UNIT 5

STUDENT BOOK 1 LESSON

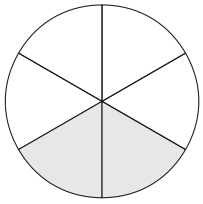
Equivalent Fractions

Quick Review

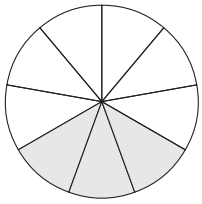
At Home At School



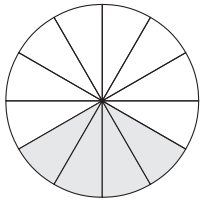
$\frac{1}{3}$ of the circle is shaded.



$\frac{2}{6}$ of the circle is shaded.



$\frac{3}{9}$ of the circle is shaded.



$\frac{4}{12}$ of the circle is shaded.

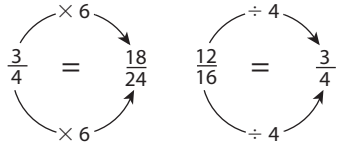
➤ $\frac{1}{3}$, $\frac{2}{6}$, $\frac{3}{9}$, and $\frac{4}{12}$ name the same amount.
They are equivalent fractions.

➤ There are patterns in the equivalent fractions.

$\frac{1}{3}, \frac{2}{6}, \frac{3}{9}, \frac{4}{12}$ ← The numerators are multiples of the least numerator, 1.

← The denominators are multiples of the least denominator, 3.

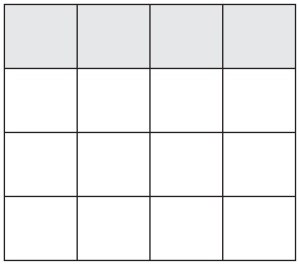
➤ You can multiply or divide the numerator and the denominator of a fraction by the same number to find equivalent fractions.



Try These

Write 3 equivalent fractions for each picture.

1.



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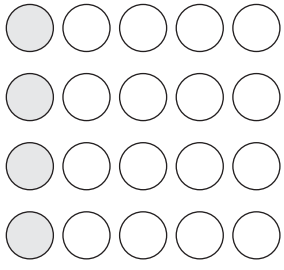
2.



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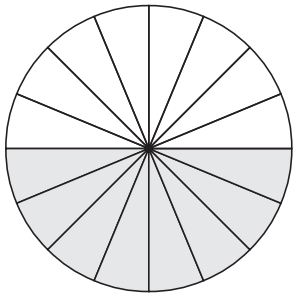
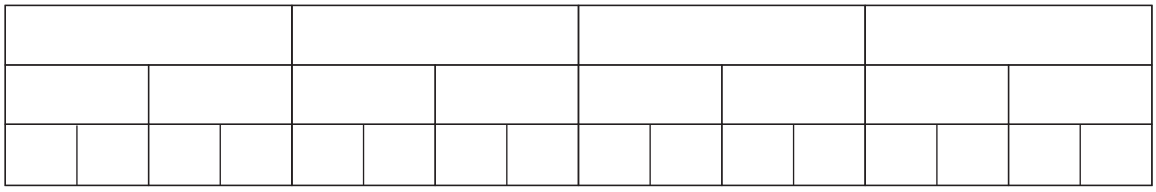
3.



_____

Practice

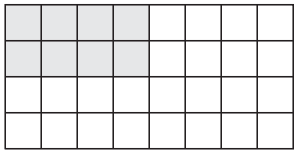
1. Write 2 equivalent fractions for each fraction.
Use the diagram to help.



a) $\frac{1}{4}$ _____ **b)** $\frac{2}{4}$ _____ **c)** $\frac{3}{4}$ _____ **d)** $\frac{4}{4}$ _____

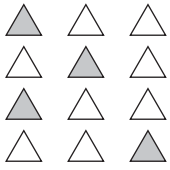
2. Write as many equivalent fractions as you can for each picture.

a)



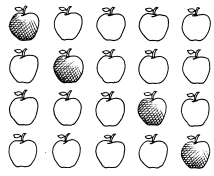
_____

b)



_____

c)



_____

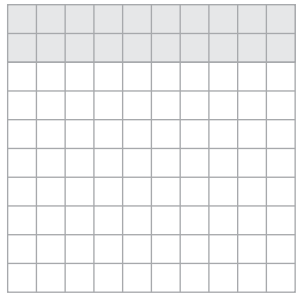
3. Draw a picture to show each pair of equivalent fractions.

a) $\frac{2}{5}$ and $\frac{6}{15}$ **b)** $\frac{4}{6}$ and $\frac{16}{24}$

Stretch Your Thinking

Find as many equivalent fractions as you can for the shaded section of this hundredths grid.

_____



UNIT 5

STUDENT BOOK 2 LESSON

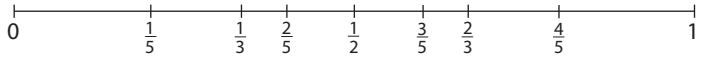
Comparing and Ordering Fractions

Quick Review

At Home At School

Here are some ways to compare and order fractions.

➤ To order $\frac{1}{2}$, $\frac{4}{5}$, and $\frac{2}{3}$:
Draw a number line.



Divide, mark, and label the number line.
From least to greatest: $\frac{1}{2}$, $\frac{2}{3}$, $\frac{4}{5}$

➤ To compare $\frac{4}{5}$ and $\frac{3}{4}$:

List equivalent fractions until the numerators or denominators are the same.

$\frac{4}{5} = \frac{8}{10} = \mathbf{\frac{12}{15}} = \mathbf{\frac{16}{20}} = \frac{20}{25}$

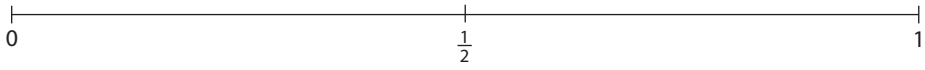
$\frac{3}{4} = \frac{6}{8} = \frac{9}{12} = \mathbf{\frac{12}{16}} = \mathbf{\frac{15}{20}}$

Since $\frac{12}{15} > \frac{12}{16}$, then $\frac{4}{5} > \frac{3}{4}$

or, since $\frac{16}{20} > \frac{15}{20}$, then $\frac{4}{5} > \frac{3}{4}$.

Try These

1. a) Show thirds, fourths, and sixths on a number line.



b) Use the number line above to order these fractions from least to greatest: $\frac{2}{3}$, $\frac{3}{4}$, $\frac{2}{6}$.

_____

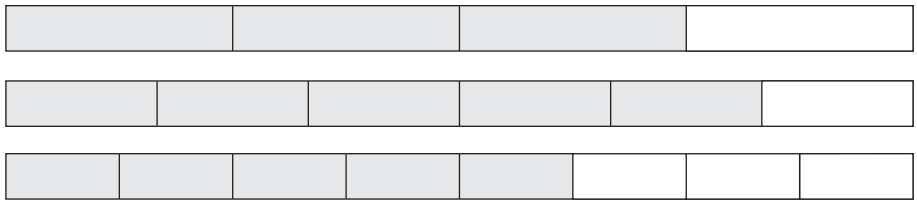
2. Use equivalent fractions to compare the fractions in each pair.

a) $\frac{4}{5}$ and $\frac{9}{10}$ _____

b) $\frac{2}{3}$ and $\frac{5}{8}$ _____

Practice

1. Use the strips below to order these fractions from least to greatest: $\frac{3}{4}$, $\frac{5}{6}$, $\frac{5}{8}$



_____

2. Use equivalent fractions to compare the fractions in each pair.
Write >, <, or =.

a) $\frac{3}{4}$ _____ $\frac{7}{8}$ **b)** $\frac{1}{2}$ _____ $\frac{3}{7}$ **c)** $\frac{2}{3}$ _____ $\frac{5}{9}$ **d)** $\frac{3}{5}$ _____ $\frac{2}{10}$

3. Which fraction in each pair is greater? Tell how you know.

a) $\frac{3}{8}$ or $\frac{5}{8}$

_____

_____

b) $\frac{4}{9}$ or $\frac{4}{7}$

_____

c) $\frac{6}{12}$ or $\frac{7}{24}$

_____

4. Name 4 fractions that are less than $\frac{2}{3}$.
Each fraction should have a different denominator.

_____

Stretch Your Thinking

1. Write a fraction to make each statement true.

a) $\frac{7}{8}$ < _____ **b)** $\frac{99}{100}$ > _____ **c)** _____ < $\frac{1}{4}$ **d)** _____ > $\frac{1}{8}$

UNIT 5

STUDENT BOOK 4 LESSON

Relating Fractions to Decimals

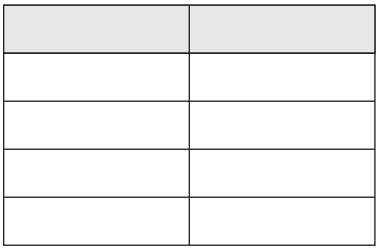
Quick Review

At Home At School

➤ You can write fractions with denominators of 10 and 100 as decimals.

$\frac{6}{10}$ is 6 tenths or 0.6. $\frac{9}{100}$ is 9 hundredths or 0.09.

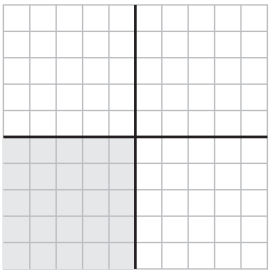
➤ If a fraction does not have a denominator of 10 or 100, try to find an equivalent fraction that does.



$\frac{1}{5}$ is equivalent to $\frac{2}{10}$.

$\frac{2}{10}$ is 2 tenths, or 0.2.

$\frac{1}{5}$ and 0.2 are equivalent.



$\frac{1}{4}$ is equivalent to $\frac{25}{100}$.

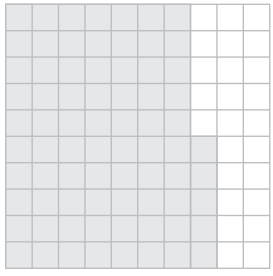
$\frac{25}{100}$ is 25 hundredths or 0.25.

$\frac{1}{4}$ and 0.25 are equivalent.

Try These

1. Write a fraction and a decimal to describe the shaded part of each grid.

a)



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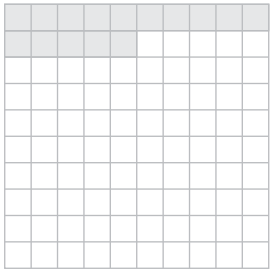
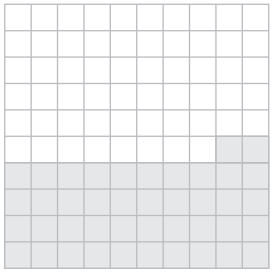
b)



_____

c)

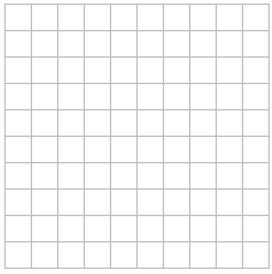


_____

Practice

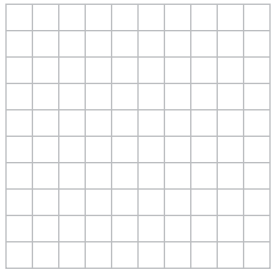
1. Colour each grid to show the fraction.
Then, write the fraction as a decimal.

a)



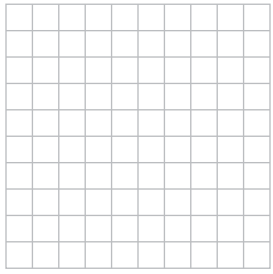
$\frac{3}{4}$ _____

b)



$\frac{8}{100}$ _____

c)



$\frac{3}{5}$ _____

2. Use >, <, or = to make each statement true.

a) $\frac{1}{4}$ _____ $\frac{25}{100}$

b) 0.07 _____ $\frac{2}{100}$

c) 0.2 _____ $\frac{20}{100}$

d) $\frac{2}{5}$ _____ $\frac{30}{100}$

e) $\frac{3}{4}$ _____ $\frac{95}{100}$

f) $\frac{1}{2}$ _____ 0.5

3. Write an equivalent fraction for each decimal.

a) 0.25 _____

b) 0.4 _____

c) 0.6 _____

d) 0.75 _____

4. Write each fraction as a decimal.

a) $\frac{1}{2}$ _____

b) $\frac{16}{20}$ _____

c) $\frac{3}{5}$ _____

d) $\frac{36}{100}$ _____

e) $\frac{3}{4}$ _____

f) $\frac{4}{5}$ _____

Stretch Your Thinking

Write a decimal that is close in value to each of these fractions:

$\frac{1}{3}$ _____

$\frac{2}{3}$ _____

$\frac{1}{8}$ _____

$\frac{5}{8}$ _____

UNIT 5

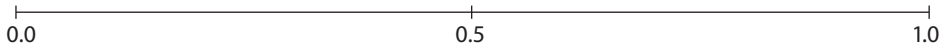
STUDENT BOOK 5 LESSON

Fraction and Decimal Benchmarks

Quick Review

At Home At School

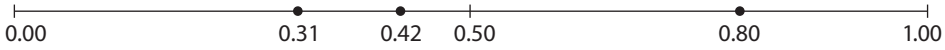
You can use benchmarks to compare and order decimals.



➤ Order 0.8, 0.42 and 0.31 from least to greatest.

Use equivalent decimals.

0.0 = 0.00 0.5 = 0.50 0.8 = 0.80 1.0 = 1.00



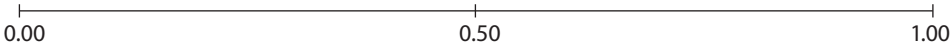
0.31 and 0.42 are between 0.00 and 0.50.
0.31 < 0.42
0.80 is between 0.50 and 1.00

From least to greatest: 0.31, 0.42, 0.8

Try These

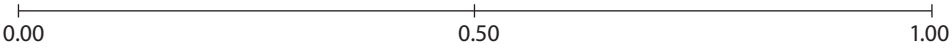
1. Estimate to place the decimals on the number line.
Order the decimals from least to greatest.

a) 0.30, 0.10, 0.70



From least to greatest: _____

b) 0.65, 0.6, 0.2



From least to greatest: _____

Practice

1. Complete. Use >, <, or =.

a) 0.40 _____ 0.70 **b)** 0.25 _____ 0.17 **c)** 0.7 _____ 0.70

d) 0.48 _____ 0.4 **e)** 0.90 _____ 0.9 **f)** 1.0 _____ 0.99

2. Order the decimals in each set from greatest to least.

a) 0.6, 0.24, 0.12 _____ **b)** 0.8, 0.75, 0.3 _____

c) 0.14, 0.2, 0.35 _____ **d)** 0.92, 0.1, 0.11 _____

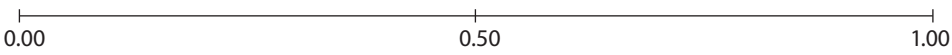
3. **a)** Complete the table.

b) Order the decimals in the table from least to greatest.

_____

Decimal	Lower Benchmark	Upper Benchmark	Nearest Benchmark
0.19	____	____	____
0.40	____	____	____
0.86	____	____	____
0.07	____	____	____

4. Use the number line below to compare the numbers $\frac{3}{4}$ and 0.7.



_____

5. Manny's snail travelled 0.89 m in 10 min.
Bertha's snail travelled 0.9 m in 10 min.
Whose snail travelled the greater distance?

_____

Stretch Your Thinking

Order these numbers from least to greatest:
0.23, $\frac{7}{10}$, 0.04, $\frac{1}{4}$, 0.8

_____

UNIT 5

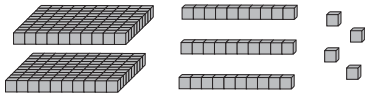
STUDENT BOOK 6 LESSON

Exploring Thousandths

Quick Review

At Home At School

➤ Numbers with **thousandths** can be shown in different ways.



Ones	Tenths	Hundredths	Thousandths
	2	3	4

$\frac{234}{1000} = 0.234$

➤ We can write some fractions with denominator 1000.

$\frac{1}{4} \xrightarrow{\times 25} \frac{25}{100} \xrightarrow{\times 10} \frac{250}{1000}$

$\frac{1}{4}$ is equivalent to $\frac{250}{1000}$.

$\frac{250}{1000}$ is 0.250.

So, $\frac{1}{4}$ is equivalent to 0.250.

➤ We can write decimals in expanded form.

4.623 = 4 ones + 6 tenths + 2 hundredths + 3 thousandths

= 4 + 0.6 + 0.02 + 0.003

➤ 0.700, 0.70, and 0.7 name the same amount.
They are **equivalent decimals**.

Try These

1. Write each number as a decimal.

a) $\frac{7}{100}$ _____ **b)** $\frac{14}{1000}$ _____ **c)** $\frac{19}{100}$ _____

d) $\frac{6}{1000}$ _____ **e)** $\frac{374}{1000}$ _____ **f)** $\frac{108}{1000}$ _____

2. Write each decimal in expanded form.

a) 0.405 _____

b) 84.037 _____

3. Write an equivalent decimal for each decimal.

a) 0.23 _____ **b)** 0.6 _____

Practice

1. Record each number in the place-value chart.

a) 76 thousandths

b) 316 and 536 thousandths

c) 185 thousandths

d) 93 and 3 thousandths

	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
a)						
b)						
c)						
d)						

2. Write each number as a fraction.

a) 0.047 _____ **b)** 0.354 _____ **c)** 0.739 _____

d) 0.001 _____ **e)** 0.72 _____ **f)** 0.506 _____

3. Write each number in question 2 in expanded form.

a) _____ **b)** _____

c) _____ **d)** _____

e) _____ **f)** _____

4. Write each fraction as a decimal.

a) $\frac{9}{1000}$ _____ **b)** $\frac{6}{100}$ _____ **c)** $\frac{85}{1000}$ _____

d) $\frac{25}{1000}$ _____ **e)** $\frac{367}{1000}$ _____ **f)** $\frac{8}{1000}$ _____

Stretch Your Thinking

Use the digits 0, 2, 3, and 6.
Make a number that is greater than 1 but less than 4.
Find as many numbers as you can.

_____

_____

UNIT 5

STUDENT BOOK 7 LESSON

Comparing and Ordering Decimals

Quick Review

At Home At School

The table shows the masses of Henry's 3 kittens.

Kitten	Mass (kg)
Foofoo	0.395
Quigley	0.364
Oscar	0.391

Here are 2 ways to order the pets from least to greatest mass.

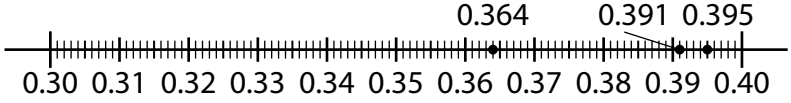
➤ Use a place-value chart.

Ones	Tenths	Hundredths	Thousandths
0	3	9	5
0	3	6	4
0	3	9	1

All 3 numbers have 0 ones and 3 tenths.
0.364 has the least number of hundredths, so it is the least number.
0.395 has the greatest number of thousandths, so it is the greatest.

The pets in order from least to greatest mass are: Quigley, Oscar, Foofoo.

➤ Use a number line.



Reading numbers from left to right gives the masses from least to greatest.

Try These

1. Use $>$, $<$, or $=$ to make each statement true.

a) 0.457 _____ 0.406 **b)** 17.63 _____ 17.630 **c)** 5.976 _____ 6.0

2. Order the numbers from greatest to least.

a) 0.36, 0.371, 0.329 _____ **b)** 2.76, 5.3, 2.485 _____

Practice

1. Play this game with a partner.
You will need 2 sets of 10 cards numbered 0 to 9, in a paper bag.

- ➤ Take turns drawing a card from the bag.
  Record the digit in any space in the first row of your game board.
  Return the card to the bag.
- ➤ Continue until all 4 spaces in a row are filled.
- ➤ Compare your numbers using $>$ or $<$.
- ➤ The player with the greater number wins a point.
- ➤ Play 4 more rounds.
  The player with the higher score wins.

Player A		Player B
_____ . _____ _____ _____	☐	_____ . _____ _____ _____
_____ . _____ _____ _____	☐	_____ . _____ _____ _____
_____ . _____ _____ _____	☐	_____ . _____ _____ _____
_____ . _____ _____ _____	☐	_____ . _____ _____ _____
_____ . _____ _____ _____	☐	_____ . _____ _____ _____

2. **a)** Write your numbers from the game in order from greatest to least.

_____

b) Write your partner's numbers from the game in order from least to greatest.

_____

Stretch Your Thinking

Write all the numbers from the game in order from least to greatest.

_____

_____

UNIT 5

STUDENT BOOK 8 LESSON

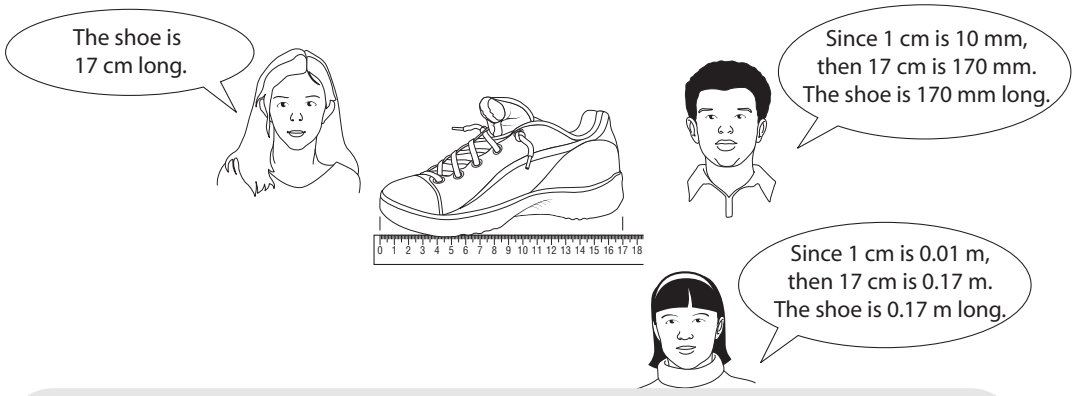
Using Decimals to Relate Units of Measure

Quick Review

At Home At School

There are relationships among the units you use to measure length.

➤ You can read the length of this shoe in several ways.



1 mm = 0.1 cm	1 cm = 10 mm	1 m = 1000 mm
1 mm = 0.001 m	1 cm = 0.01 m	1 m = 100 cm

Try These

1. Record each measure in millimetres and metres.

a) 7 cm _____ **b)** 56 cm _____

c) 13 cm _____ **d)** 40 cm _____

2. Record each measure in millimetres and centimetres.

a) 4 m _____ **b)** 6 m _____

c) 3.2 m _____ **d)** 40 m _____

3. Use =, <, or > to make each statement true.

a) 4.16 m ____ 416 cm **b)** 75 cm ____ 7.5 m

c) 7.2 m ____ 7200 mm

Practice

1. Complete.

a) 53 cm = _____ m **b)** 4.1 m = _____ cm **c)** 85 mm = _____ cm

d) 0.25 m = _____ cm **e)** 8.6 m = _____ mm **f)** 25 cm = _____ mm

2. Write each length using 2 different units.

a) 60 mm _____ **b)** 4 cm _____

c) 0.03 m _____ **d)** 2.5 m _____

3. Here are the lengths of 5 types of eggs.

Type of Egg	Length
Canada Goose	8.6 cm
Robin	1.9 cm
Hummingbird	13 mm
Ostrich	18 cm
Cuckoo	35 mm

a) Which is longer, a robin egg or a cuckoo egg? _____

b) Which is shorter, a hummingbird egg or a robin egg? _____

c) About how many times as long as a Canada goose egg is an ostrich egg? _____

d) Put the eggs in order from shortest to longest.

_____

4. Darwin is 1.06 m tall. Carleton is 157 cm tall.
Which boy is taller? _____ How much taller is he? _____

5. Draw a line 9 cm long. Write its length using 2 other units.

_____

Stretch Your Thinking

Which would you rather have, a pile of loonies 350 mm tall or a pile of loonies 0.49 m tall? Explain.

_____

_____

UNIT 5

STUDENT BOOK 9 LESSON

Relating Fractions and Decimals to Division

Quick Review

At Home At School

➤ Wayne has 5 fruit bars to share among 3 people.
How much will each person get?

Divide.
Five fruit bars shared among 3 people is written as $5 \div 3$.

$$3\overline{)5}\quad 1\text{ R}2$$

There are 2 left over.
Divide each leftover fruit bar in thirds.

There are 6 thirds.
Each person gets 2 thirds of the leftover fruit bars.
So, each person gets 1 fruit bar and $\frac{2}{3}$ more.

➤ Any division statement can be written as a fraction.
$5 \div 3 = \frac{5}{3}$

Try These

1. Write each division statement as a fraction.

a) $3 \div 7$ _____ **b)** $4 \div 6$ _____ **c)** $5 \div 9$ _____

d) $8 \div 6$ _____ **e)** $10 \div 4$ _____ **f)** $12 \div 5$ _____

2. Write each fraction as a division statement.

a) $\frac{4}{5}$ _____ **b)** $\frac{12}{8}$ _____ **c)** $\frac{15}{4}$ _____

d) $\frac{1}{6}$ _____ **e)** $\frac{3}{4}$ _____ **f)** $\frac{26}{3}$ _____

Practice

Draw a picture to solve each problem. Show all your work.

1. How many pears would each person get if 14 pears are shared among 4 people?

_____

2. Salvador baked 3 apple tarts.
He shared them equally among 4 friends.
How much did each friend get?

_____

_____

_____

3. Eight people won $200. How much will each person's share be?

_____

_____

Stretch Your Thinking

Each of 4 people got 5 cookies and $\frac{3}{4}$ more.
How many cookies were shared?

_____

_____

UNIT 5

STUDENT BOOK 10 LESSON

Estimating Sums and Differences

Quick Review

At Home At School

Here are 2 ways to estimate 4.548 + 2.417.

- Write each decimal to the nearest whole number:
  5 + 2 = 7 So, 4.548 + 2.417 is about 7.
- Write only 1 decimal to the nearest whole number:
  5 + 2.417 = 7.417 So, 4.548 + 2.417 is about 7.417.

Here are 2 ways to estimate 4.538 − 2.417.

- Write the second decimal to the nearest whole number:
  4.538 − 2 = 2.538 So, 4.538 – 2.417 is about 2.538.
- Write both decimals to the nearest whole number:
  5 – 2 = 3
  So, 4.538 – 2.417 is about 3.

Try These

1. Estimate each sum.

a) 2.54 + 7.16 _____

b) 4.197 + 3.864 _____

c) 0.765 + 1.295 _____

d) 5.765 + 3.189 _____

e) 0.473 + 1.697 _____

f) 2.008 + 3.801 _____

2. Estimate each difference.

a) 7.546 − 3.518 _____

b) 2.476 − 1.555 _____

c) 7.9 − 3.267 _____

d) 3.204 − 0.938 _____

e) 1.497 − 0.126 _____

f) 12.094 − 8.259 _____

Practice

1. Estimate each sum or difference.

a) 27.6 + 49.23 _____

b) 16.257 − 9.396 _____

c) 4.875 − 2.93 _____

d) 7.596 + 2.17 _____

e) 13.123 − 6.959 _____

f) 10.67 + 7.834 _____

2. a) Joline bought a pair of skates for $79.95.
She also bought a pullover for $45.25.
Estimate the total cost of Joline's purchases. _____

b) Estimate how much more Joline paid for the skates than the pullover.

_____

3. The table shows the masses of five puppies.

Masses of Puppies	
Name	**Mass (kg)**
Brutus	3.106
Tawny	0.992
Zara	1.935
Zena	2.791
Zeus	1.276

a) Estimate the combined masses of:

Brutus and Zeus _____

Tawny and Zena _____

Zeus and Zara _____

Zara and Tawny _____

b) Estimate the difference in masses of:

Zara and Zena _____

Brutus and Zeus _____

Tawny and Zara _____

The heaviest and lightest puppies _____

4. Circle the better estimate.

a) 3.549 + 6.831 9 or 10 **b)** 4.316 − 0.135 3 or 4

Stretch Your Thinking

Estimate the combined mass of the five puppies.

_____

UNIT 5

STUDENT BOOK 11 LESSON

Adding Decimals

Quick Review

At Home At School

Madison rode her bike 11.76 km on Saturday and 6.18 km on Sunday. What total distance did Madison ride?

You can use place value to add 11.76 + 6.18.
First estimate.
11.76 is about 12.
6.18 is about 6.
12 + 6 = 18

Step 1: Record the numbers. Align them as they are aligned in the place-value chart.

Tens	Ones	Tenths	Hundredths
1	1	7	6
	6	1	8

$$\begin{array}{r} 11.76 \\ +\ 6.18 \\ \hline \end{array}$$

Step 2: Add as you would with whole numbers.

$$\begin{array}{r} {}^{1} \\ 11.76 \\ +\ 6.18 \\ \hline 17.94 \end{array}$$

Add the hundredths.
Regroup 14 hundredths as 1 tenth 4 ones.
Add the tenths.
Add the ones.
Add the tens.

17.94 is close to the estimate of 18, so the answer is reasonable.

Try These

1. Estimate first. Then add.

a) $\begin{array}{r} 3.4 \\ +\ 9.3 \\ \hline \end{array}$ **b)** $\begin{array}{r} 6.8 \\ +\ 4.7 \\ \hline \end{array}$ **c)** $\begin{array}{r} 7.54 \\ +\ 3.62 \\ \hline \end{array}$ **d)** $\begin{array}{r} \$8.09 \\ +\ \$7.68 \\ \hline \end{array}$

e) $\begin{array}{r} 25.2 \\ +\ 13.9 \\ \hline \end{array}$ **f)** $\begin{array}{r} \$43.16 \\ +\$\ 8.97 \\ \hline \end{array}$ **g)** $\begin{array}{r} 0.97 \\ +\ 1.23 \\ \hline \end{array}$ **h)** $\begin{array}{r} 18.40 \\ +\ 26.60 \\ \hline \end{array}$

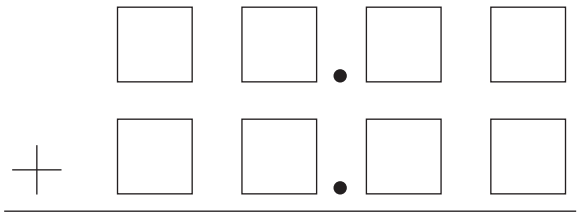
Practice

1. Add. Estimate to check.

a) 9.7 + 4.9	**b)** 16.3 + 12.8	**c)** $4.07 + $8.63	**d)** 21.60 + 14.73
e) 35.7 + 98.6	**f)** $1.54 + $3.65	**g)** 6.28 + 12.32	**h)** 47.37 + 19.08

2. Play this game with a partner.
You will need paper, pencils, and a number cube, labelled 1 to 6.
The object of the game is to get the greater sum.

➤ Draw an addition grid like this on your paper:



➤ Take turns to roll the number cube. Record the number rolled in any box in your addition grid.
➤ Continue until all the boxes in your grid are full.
➤ Add. The player with the greater sum scores 1 point.
➤ Play 4 more rounds to find the overall winner.
➤ Play the game again. This time, try to get the lesser sum.

Stretch Your Thinking

Find 2 decimals with a sum of 9.76.
Do this in as many ways as you can.

UNIT 5

STUDENT BOOK 12 LESSON

Subtracting Decimals

Quick Review

At Home At School

Joline grew 2 pumpkins in her garden.
The masses of her pumpkins are 7.05 kg and 9.84 kg.
What is the difference in the masses?

You can use place value to find 9.84 – 7.05.

Step 1: Record the numbers. Align them as they are aligned in the place-value chart.

Ones	Tenths	Hundredths
9	8	4
7	0	5

$$\begin{array}{r} 9.84 \\ -\ 7.05 \end{array}$$

Step 2: Subtract as you would with whole numbers.

$$\begin{array}{r} {}^{7}\not{9}.{}^{14}\not{8}\not{4} \\ -\ 7.05 \\ \hline 2.79 \end{array}$$

Regroup 1 tenth as 10 hundredths.
Subtract the hundredths.
Subtract the tenths.
Subtract the ones.

Add to check your answer.

$$\begin{array}{r} 7.{}^{1}05 \\ +\ 2.79 \\ \hline 9.84 \end{array}$$

Try These

1. Estimate first. Then subtract.

a) $\begin{array}{r} 6.8 \\ -\ 4.3 \end{array}$ **b)** $\begin{array}{r} 8.5 \\ -\ 0.9 \end{array}$ **c)** $\begin{array}{r} 2.67 \\ -\ 1.38 \end{array}$ **d)** $\begin{array}{r} \$12.45 \\ -\ \$\ 8.68 \end{array}$

Practice

1. Subtract. Add to check.

a) 9.4 − 6.8

b) 25.8 − 16.9

c) 7.04 − 2.13

d) 8.62 − 5.74

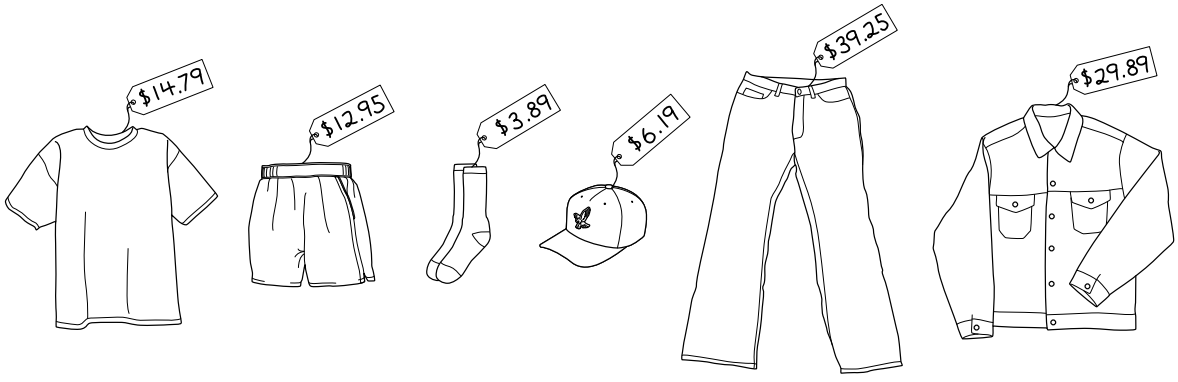
e) 14.25 − 8.37

f) $ 20.15 − $ 9.48

g) 84.08 − 47.16

h) 52.34 − 26.89

2.



a) How much more than the jacket do the jeans cost? _____

b) Jerry paid for a baseball hat with a $10 bill.

How much change did he get? _____

c) Sylvie bought a shirt and a pair of socks. She gave the clerk $20.

How much change did she get? _____

d) What is the difference in price between the least expensive and most expensive items? _____

e) Which 2 items have each difference in price?

$26.30 _____

$15.10 _____

$6.76 _____

Stretch Your Thinking

Name 2 decimals whose difference is between 9 and 10, but closer to 9.

_____

UNIT 5

STUDENT BOOK 13 LESSON

Adding and Subtracting Decimals

Quick Review

At Home At School

➤ You can use place value to add 5.763 and 3.949.

Step 1: Estimate.
Write the second decimal to the nearest whole number.

Add: 5.763 + 4 = 9.763

So, 5.763 + 3.949 is about 9.763.

Step 2: Add as you would with whole numbers.

$$\begin{array}{r} {\scriptstyle 1\ 1\ 1} \\ 5.763 \\ +\ 3.949 \\ \hline 9.712 \end{array}$$

9.712 is close to the estimate, so the answer is reasonable.

➤ You can use place value to subtract 3.949 from 5.763.

Step 1: Subtract as you would with whole numbers.

$$\begin{array}{r} {\scriptstyle 4\ 17513} \\ 5.7\not{6}\not{3} \\ -\ 3.949 \\ \hline 1.814 \end{array}$$

Step 2: Estimate to check the answer is reasonable.
Write 3.949 as 4.
Subtract: 5.763 − 4 = 1.763

1.814 is close to the estimate, so the answer is reasonable.

Try These

1. Add. Estimate to check your answers.

a) 4.521 + 3.097

b) 2.168 + 0.948

c) 7.169 + 8.473

d) 6.704 + 0.491

2. Subtract. Estimate first. Then subtract.

a) 9.732 − 0.489

b) 6.371 − 1.098

c) 4.152 − 4.097

d) 3.652 − 1.984

Practice

1. Add. Use subtraction to check each answer.

a) $4.157 + 6.346 =$ _____ $-$ _____

b) $27.309 + 14.167 =$ _____ $-$ _____

c) $3.187 + 4.679 =$ _____ $-$ _____

d) $5.138 + 12.349 =$ _____ $-$ _____

e) $0.573 + 4.497 =$ _____ $-$ _____

f) $36.234 + 14.875 =$ _____ $-$ _____

2. Subtract. Use addition to check each answer.

a) $7.243 - 2.807 =$ _____ $+$ _____

b) $4.583 - 2.338 =$ _____ $+$ _____

c) $13.040 - 7.862 =$ _____ $+$ _____

d) $11.431 - 8.763 =$ _____ $+$ _____

e) $4.010 - 2.862 =$ _____ $+$ _____

f) $73.832 - 51.765 =$ _____ $+$ _____

3. The difference in the masses of 2 objects is 0.479 kg.

a) What might the mass of each object be? _____

b) What might the objects be? _____

4. Salvatore ran 2.457 km on Saturday and 3.169 km on Sunday.

a) How far did Salvatore run in all? _____

b) How much further did he run on Sunday than on Saturday?

_____

Stretch Your Thinking

Use each of the digits 1 to 8 once to make this subtraction true.

$$\square.\square\square\square - \square.\square\square\square = 1.347$$

UNIT 6

STUDENT BOOK 1 LESSON

Describing Shapes

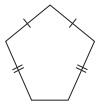
Quick Review

At Home At School

Here are some attributes of shapes.

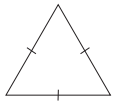
➤ The lengths of the sides:

This shape has some sides the same length.



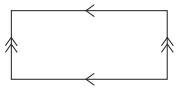
We use hatch marks to show equal lengths.

This shape has all sides the same length.



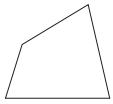
➤ The direction of the sides:

This shape has 2 pairs of **parallel** sides.

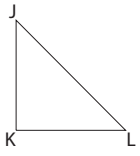


We use arrows to show parallel lines.

This shape has no parallel sides.



➤ We can label each vertex and then name the shape by its vertices.



This is triangle JKL.
It has 3 sides:
JK, JL, and KL

Try These

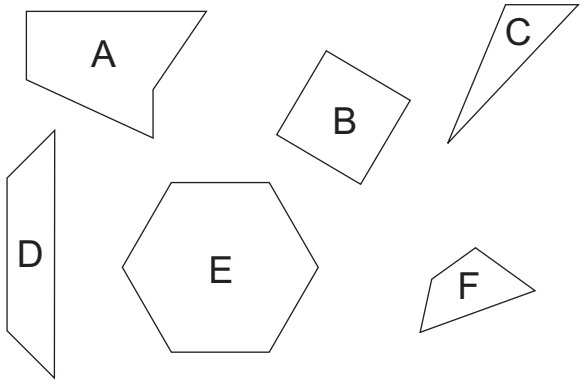
1. Tell which shapes have:

a) no parallel sides _____

b) all sides different lengths _____

c) all sides the same length _____

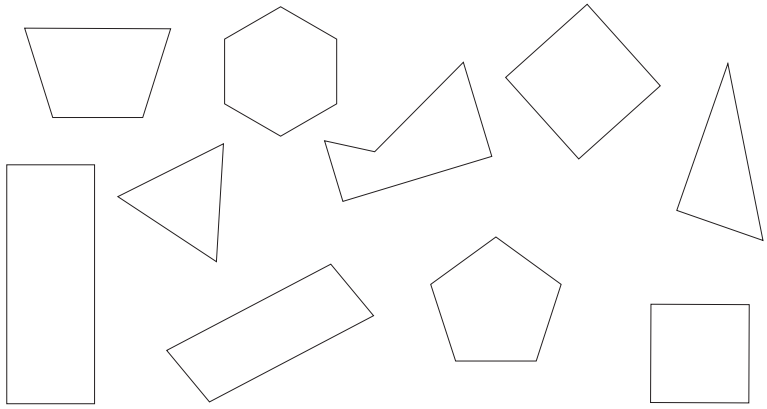
d) some parallel sides _____



Practice

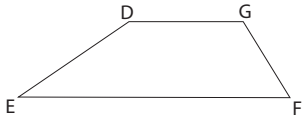
1. Find the shapes below that have each of these attributes.
Label the shapes with the letters.

A — has all sides the same length
B — has no sides the same length
C — has some sides the same length
D — has 1 pair of parallel sides
E — has 2 pairs of parallel sides
F — has more than 2 pairs of parallel sides
G — has no parallel sides



2. **a)** Use letters to name this shape. _____

b) Use letters to name the sides. _____



Stretch Your Thinking

Draw as many figures as you can with 2 pairs of parallel sides.

UNIT 6

STUDENT BOOK 2 LESSON

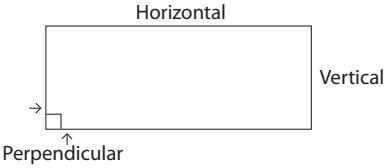
Investigating Perpendicular Sides

Quick Review

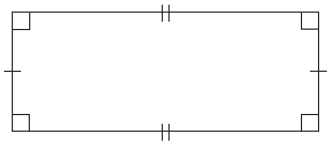
At Home At School

➤ Look at the chalkboard.

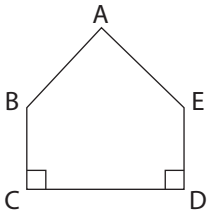
The top and bottom edges are **horizontal**.
The side edges are **vertical**.
A horizontal edge and a vertical edge are **perpendicular**.
That is, these edges intersect to form a **right angle**.



When 2 sides of any shape make a right angle, we say the sides are perpendicular.
We draw a square to show a right angle.



This shape has 5 sides.
It is a pentagon.
In pentagon ABCDE,
BC is perpendicular to CD.
We write: BC ⊥ CD
Also, ED ⊥ CD



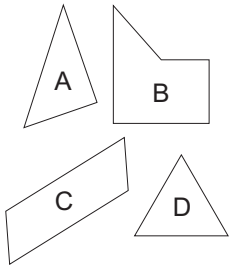
Try These

1. Tell which shapes have:

a) three right angles _____

b) no right angles _____

c) one right angle _____

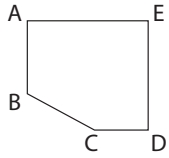


2. Look at the shape. Name:

a) horizontal sides _____

b) vertical sides _____

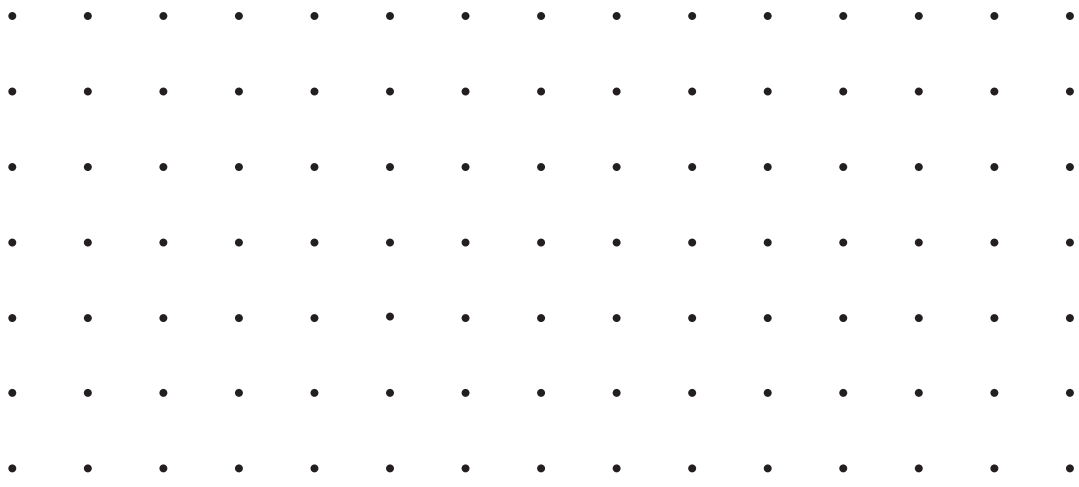
c) perpendicular sides _____



Practice

1. Use the dot paper below.
Draw a shape that fits each description.
Label each shape with its letter.

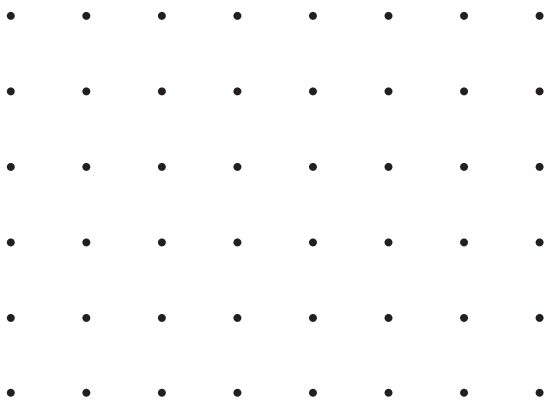
A — has exactly four right angles
B — has only one right angle
C — has exactly 2 pairs of perpendicular sides
D — has no right angles
E — has exactly 3 horizontal sides
F — has exactly 1 pair of perpendicular sides



Stretch Your Thinking

Draw a shape on the dot paper.

Give your shape as many
right angles as you can.



UNIT 6

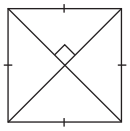
STUDENT BOOK 3 LESSON

Investigating Quadrilaterals

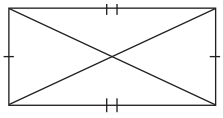
At Home At School

Quick Review

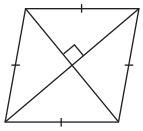
- A square has 4 sides equal.
  The diagonals are equal and perpendicular.



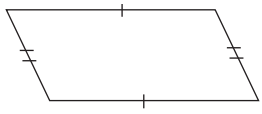
- A rectangle has 2 pairs of opposite sides equal.
  The diagonals are equal.



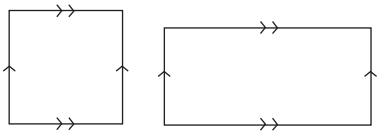
- A **rhombus** has 4 sides equal.
  The diagonals are perpendicular.



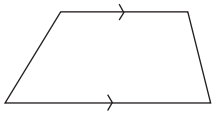
- A **parallelogram** has 2 pairs of opposite sides equal.



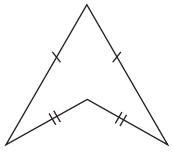
- All squares, rectangles, parallelograms, and rhombuses have 2 pairs of parallel sides.



- A **trapezoid** has exactly 1 pair of parallel sides.



- A **kite** has exactly 2 pairs of equal adjacent sides.



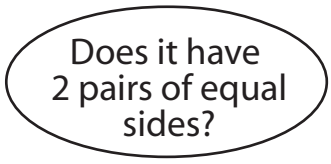
Try These

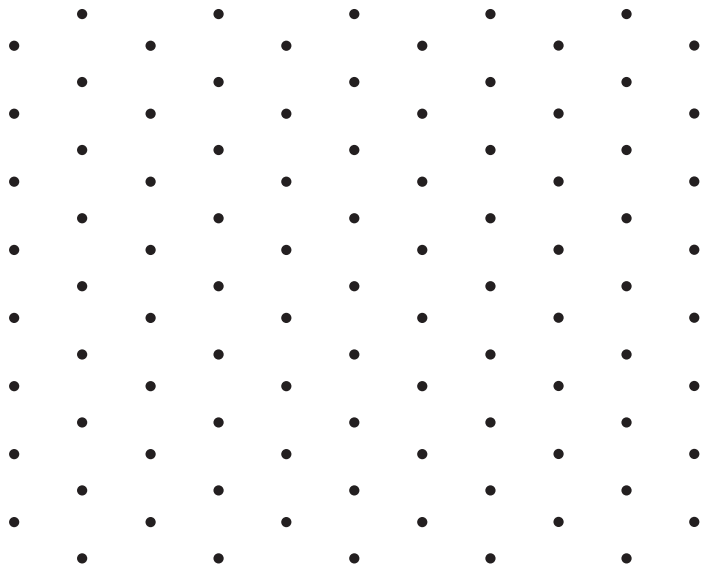
1. Draw 2 different quadrilaterals on the dot paper.
Mark equal sides with hatch marks. Mark parallel sides with arrows.

Practice

1. Play this game with a partner.

You will need:
Dot paper
Pencil





Player A

➤ Make a quadrilateral on the dot paper without letting your partner see. The quadrilateral should have at least one pair of equal or parallel sides.

Player B

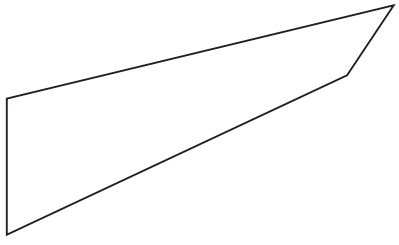
➤ Ask your partner "Yes–No" questions about the quadrilateral.
The questions can be about
- the number of equal sides
- the number of parallel sides
- the diagonals

➤ Keep asking questions until you think you know the quadrilateral. Guess the quadrilateral. If you are right, you get a point.

Switch roles and play again.
Keep playing until one player has 5 points.

Stretch Your Thinking

Explain why this quadrilateral cannot be called a square, a parallelogram, a rectangle, a rhombus, or a trapezoid.



_____

_____

UNIT 6

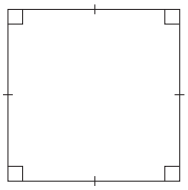
STUDENT BOOK 4 LESSON

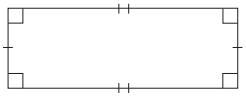
Other Attributes of Quadrilaterals

Quick Review

At Home At School

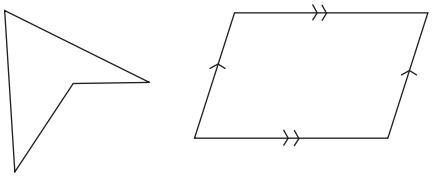
All squares and rectangles have
4 right angles.
Adjacent sides are perpendicular.



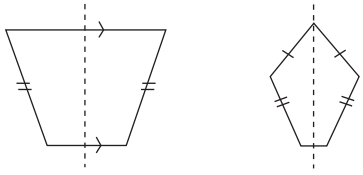


A shape is symmetrical when it can be folded so that one part matches the other part exactly.
The fold line is the line of symmetry.

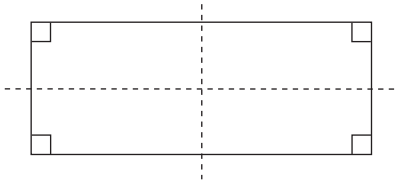
➤ No lines of symmetry



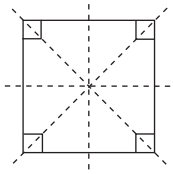
➤ 1 line of symmetry



➤ 2 lines of symmetry



➤ 4 lines of symmetry



Try These

1. Draw a quadrilateral with each attribute.

a) 0 lines of symmetry **b)** 1 line of symmetry **c)** exactly 2 right angles

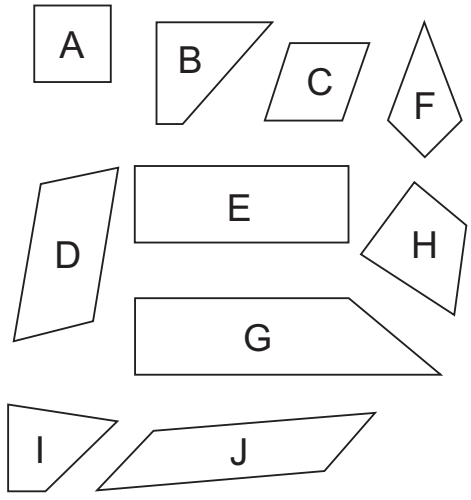
2. Why is a rectangle not a kite?

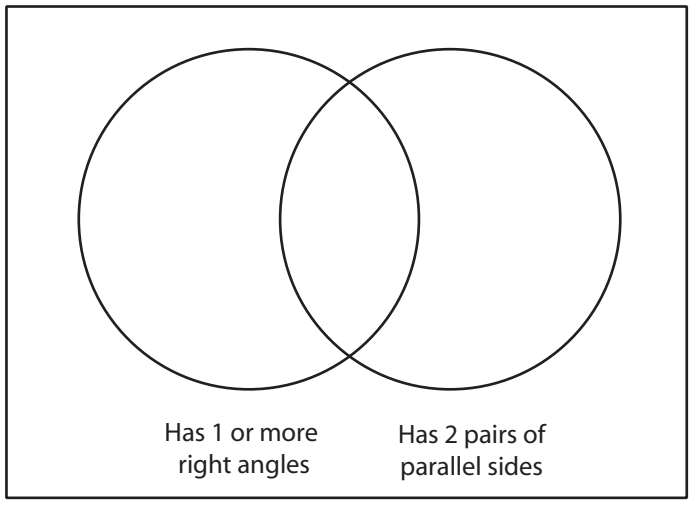
_____

_____

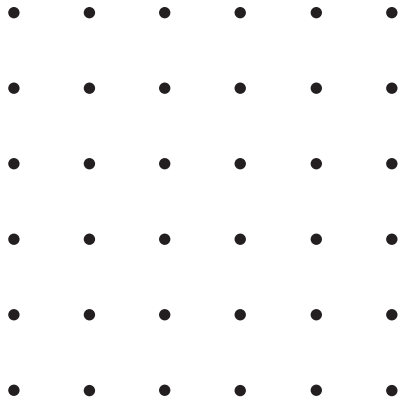
Practice

1. Use the Venn diagram to sort the quadrilaterals.





2. **a)** Draw a trapezoid on the dot grid.



b) Write a statement about your trapezoid that is true.

_____

_____

c) Write a statement about a trapezoid that is never true.

_____

_____

Stretch Your Thinking

Explain why a square is a parallelogram and a rhombus.

_____

_____

_____

UNIT 6

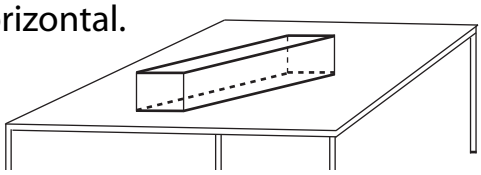
STUDENT BOOK 6 LESSON

Exploring Faces and Edges of Objects

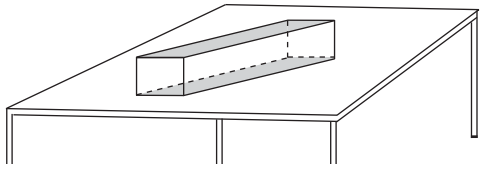
Quick Review

At Home At School

The rectangular prism sits on a table.
Look at its edges. The bold edges are horizontal.
The longer edges are parallel.
The shorter edges are parallel.
Each other edge is perpendicular to the edges where the bold edges intersect.

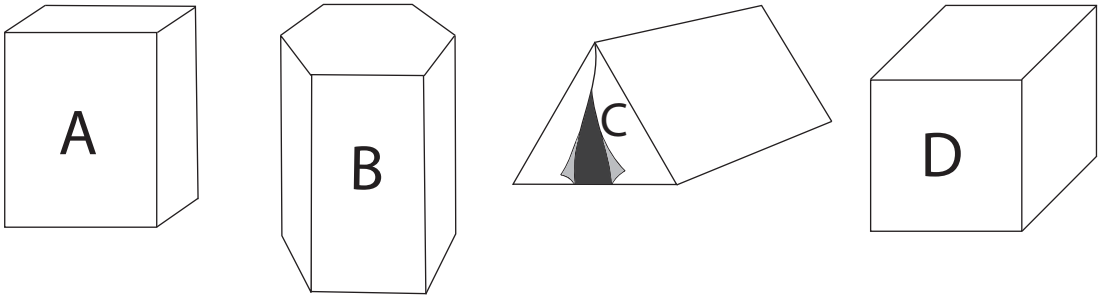


Here is the same prism.
Look at its faces.
The shaded faces are horizontal.
They are also parallel.
Each unshaded face is vertical.
So, each unshaded face is perpendicular to the shaded faces.
The two pairs of opposite unshaded faces are also parallel.



Try These

1.



Write the letters of the objects that have:

a) horizontal edges _____

b) horizontal faces _____

c) perpendicular edges _____

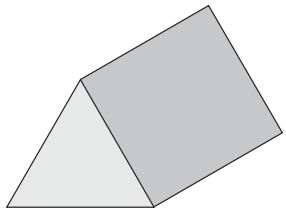
d) vertical faces _____

e) parallel edges _____

f) parallel faces _____

Practice

1. **a)** How are these prisms the same?

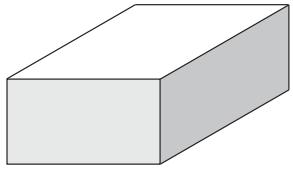


_____

_____

_____

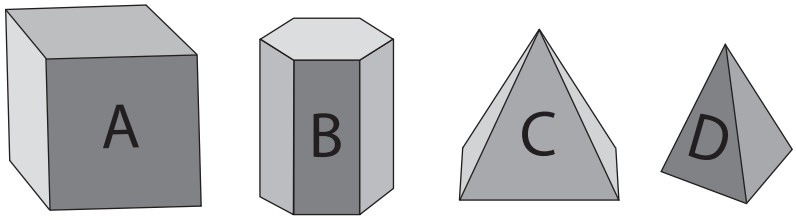
b) How are they different?



_____

_____

2.



Write the letters of the objects that have:

a) parallel edges _____ **b)** parallel faces _____

c) perpendicular edges _____ **d)** perpendicular faces _____

e) vertical edges _____ **f)** vertical faces _____

3. Look at this object.
Write how many of each:

a) parallel faces _____ **b)** horizontal edges _____

c) horizontal faces _____ **d)** vertical faces _____

Stretch Your Thinking

Find a geometric object. Write a riddle that describes the attributes of the object. Ask a classmate to solve your riddle.

_____

_____

UNIT 6

STUDENT BOOK 7 LESSON

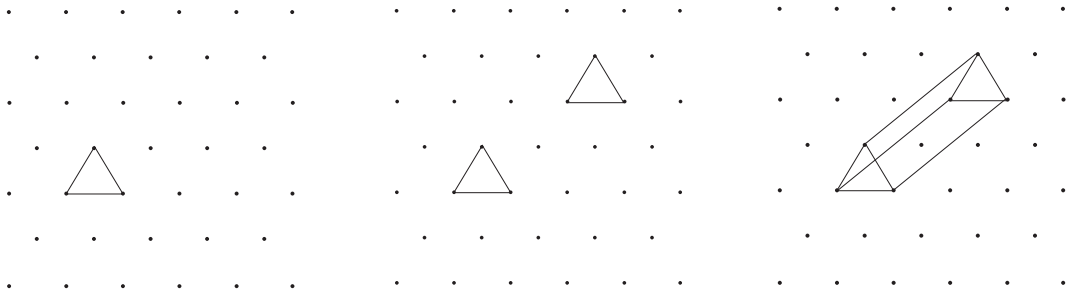
Drawing Objects

Quick Review

At Home At School

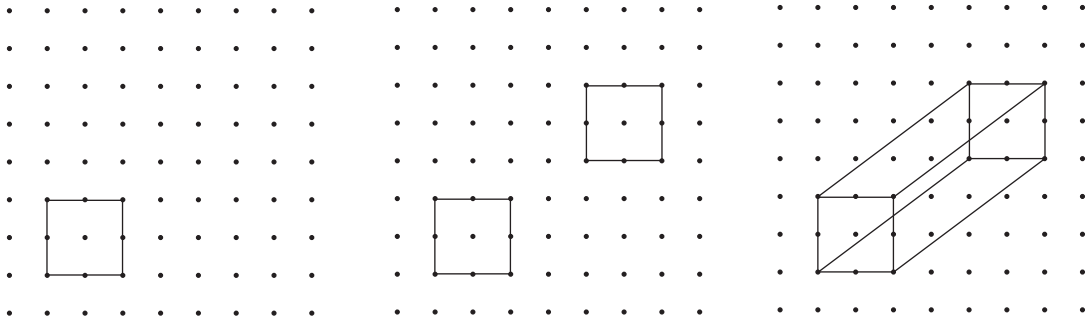
➤ Here is how to draw a triangular prism on triangular dot paper:

Step 1 Step 2 Step 3



➤ Here is how to draw a rectangular prism on square dot paper:

Step 1 Step 2 Step 3



Try These

Follow the steps above to draw:

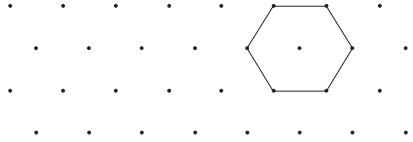
a) the triangular prism

b) the rectangular prism

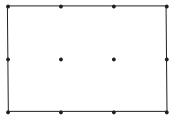
Practice

1. Each picture below is the front or back face of a prism.
Complete each prism.

a)

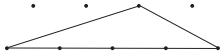


b)

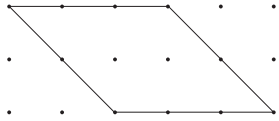


2. Each picture below is the base of a pyramid.
Complete each pyramid.

a)



b)



3. Draw a prism with a pentagonal front face.

Stretch Your Thinking

Draw as many prisms as you can that have a square as a front face.

UNIT 7

STUDENT BOOK 1 LESSON

First-Hand Data and Second-Hand Data

At Home At School

Quick Review

Data that you collect yourself are called **first-hand data**.
Data collected by someone else are called **second-hand data**.

➤ Kriti read the temperature outside the classroom window every day for a week. For Kriti, these results are first-hand data. For you, these results are second-hand data.

Daily Temperatures This Week

Day	Temperature (°C)
Monday	5
Tuesday	8
Wednesday	7
Thursday	9
Friday	11

➤ Kriti also looked at temperatures in the newspaper.
These results are second-hand data.

World Temperatures Today

City	Temperature (°C)
Acapulco	32
Cairo	24
Tokyo	14
Bangkok	33

Try These

1. Would you use first-hand or second-hand data to answer each question?

a) How many students in your class wear glasses? _____

b) Which foods are high in fibre? _____

c) What is the population of China? _____

d) What are the favourite sports of students in your class? _____

e) How many people visit the Yukon each year? _____

2. Charlie wants to find out how many birds come to the feeder in his backyard each day. Should he use first-hand or second-hand data? Explain.

_____

_____

Practice

1. Rae-Lyn wonders how many children on her street take the bus to school. She counts the children as they get on the bus.
Are these first-hand or second-hand data? Explain.

_____

2. Miroki uses a Statistics Canada Web site to find the population of the capital city of each province and territory. Are these first-hand or second-hand data? Explain.

_____

_____

3. Would you use first-hand or second-hand data to answer each question?

a) How many planets have rings? _____

b) How much water do your classmates drink in a day? _____

c) How many new vehicles are sold in Canada each year? _____

4. Name 3 different sources you could go to for second-hand data.

_____

5. Mariya wants to find out how many lighthouses there are in Canada. Should she use first-hand or second-hand data? Why?

_____

_____

Stretch Your Thinking

Name 3 questions you could answer by using second-hand data.

_____

_____

_____

UNIT 7

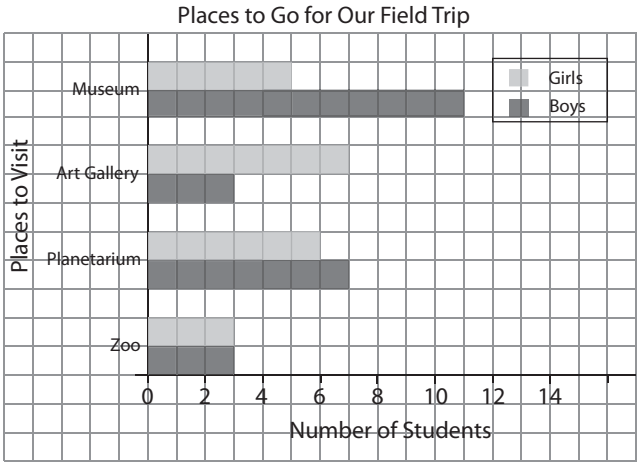
STUDENT BOOK 2 LESSON

Interpreting Double Bar Graphs

Quick Review

At Home At School

A **double bar graph** displays two sets of data at once.



The **vertical axis** shows the places to visit.
The **horizontal axis** shows how many students want to visit each place.
The *scale* is one square represents 1 student.
The **legend** tells what the 2 colours represent.

From the double bar graph, we know that:
• More boys than girls want to go to the planetarium.
• More girls than boys want to go to the art gallery.

Try These

Use the double bar graph above to answer these questions.

1. What is the most popular choice for boys? _____

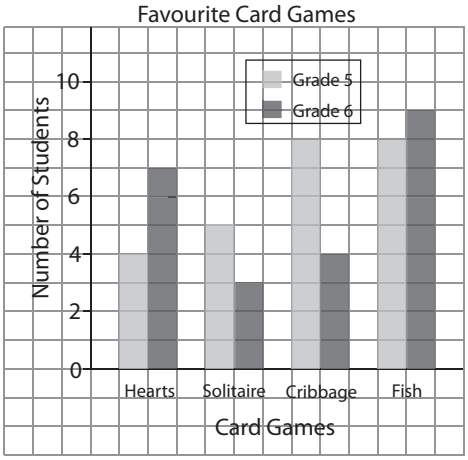
For girls? _____

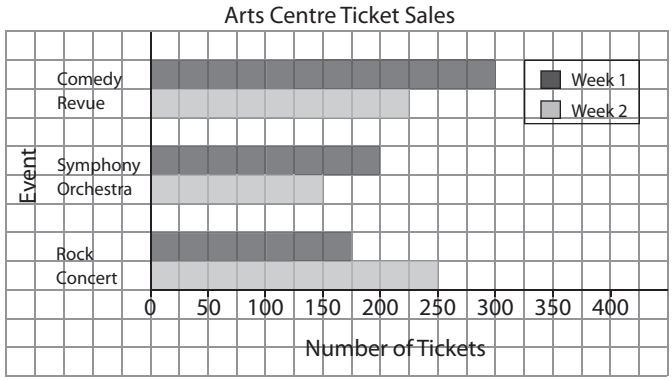
2. How many boys were surveyed? _____ How many girls? _____

3. What is the least popular choice for boys? _____

For girls? _____

Practice





1. For the first graph above:

a) Write a question you could answer using the graph.

_____

b) Answer your question. _____

_____

2. For the second graph above:

a) Write a question you could answer using the graph.

_____

b) Answer your question. _____

_____

Stretch Your Thinking

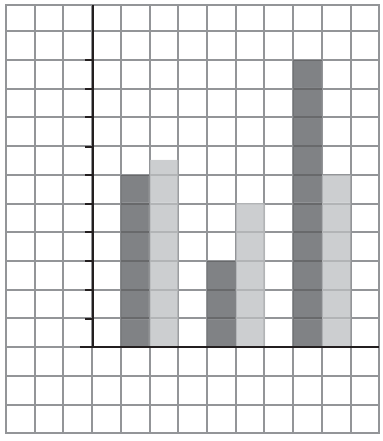
What could this double bar graph represent?
Give the graph a title and legend.
Label each axis.

_____

_____

_____

_____



UNIT 7

STUDENT BOOK 3 LESSON

Constructing Double Bar Graphs

Quick Review

At Home At School

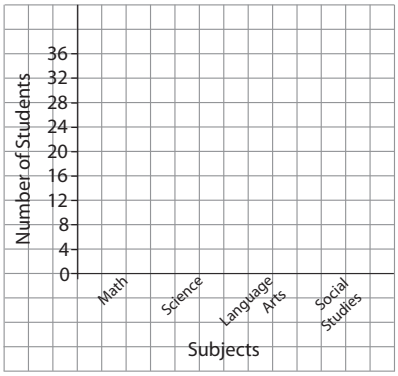
This table shows the results of a survey.

You can display these data in a double bar graph.

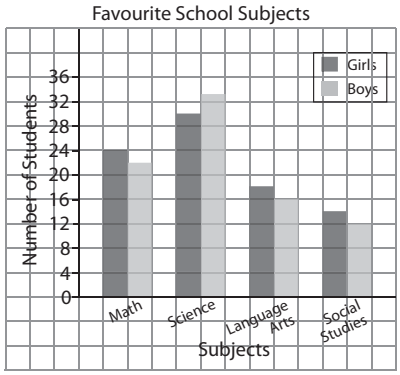
Favourite School Subjects

Subject	Girls	Boys
Math	24	22
Science	30	33
Language Arts	18	16
Social Studies	14	12

➤ First, draw and label 2 axes. Then choose a scale.



➤ Draw 2 bars for each subject in the table.



➤ Finally, draw a legend and give the graph a title.

Try These

1. Draw a double bar graph to display the data in the table.

Trees Planted

Type of Tree	May	June
Maple	200	175
Elm	125	120
Oak	175	200

2. Write a question about the graph.
Answer the question.

_____

_____

Practice

1. a) Draw a double bar graph to display the data in the table.

Rolling a Number Cube

Number Rolled	Ali	Yashi
1	𝍸 I	III
2	IIII	𝍸
3	IIII	𝍸 I
4	𝍸 I	III
5	𝍸	𝍸 II
6	𝍸	𝍸 I

b) How many rolls did each person make? _____

c) Which number came up most often? _____

d) What conclusions can you draw from the graph?

_____

Stretch Your Thinking

Draw a graph to display the data in this table.

Olympic Medals Won

Athlete	Gold	Silver	Bronze
L. Latynina	9	5	4
T. Ono	5	4	4
P. Nurmi	9	3	0
S. Kato	8	3	1

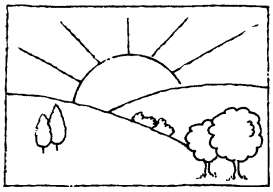
UNIT 7

STUDENT BOOK 4 LESSON

The Language of Probability

Quick Review

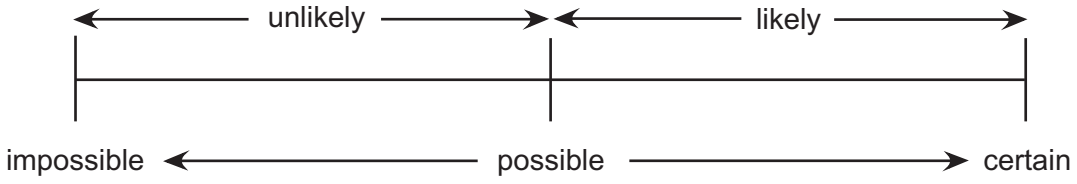
Some events are **impossible**.



Some events are **certain**.

An event that is likely to happen is **probable**.
An event that is unlikely to happen is **improbable**.

You can use a line to show how likely it is an event will happen.



The **probability** of an event is a measure of how likely the event is to happen.

Try These

1. Use a word from the box to describe each event.

possible
impossible
certain
unlikely
likely

a) It will rain meatballs this summer. _____

b) We will have a fire drill this week.

_____

c) You will walk on the moon. _____

2. Draw counters in the bag so that:

a) Picking a red counter is likely.

b) Picking a blue counter is unlikely.

c) Picking an orange counter is impossible.

Practice

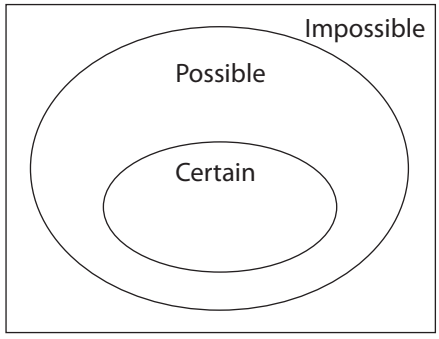
1. Write a sentence using each word.

a) likely _____

b) unlikely _____

2. Use the Venn diagram to sort these events.

A The sun will set this evening.
B A dog will walk down your street today.
C Next week will have 7 days.
D You will wear a blue shirt tomorrow.
E You will see a real pig reading a poem.



3. Suppose you put these cards in a bag and then pull one card out without looking. Tell which number:

a) You are least likely to pick. _____

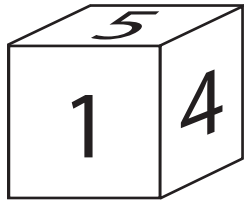
b) You are most likely to pick. _____

c) It is impossible to pick. _____

7	2	7
3	7	3
7	3	7

Stretch Your Thinking

Suppose your brother says, "I'll roll a number cube.
If an odd number comes up, I'll do the dishes.
If an even number comes up, you'll do the dishes."
Should you take his offer? Explain.



_____

_____

_____

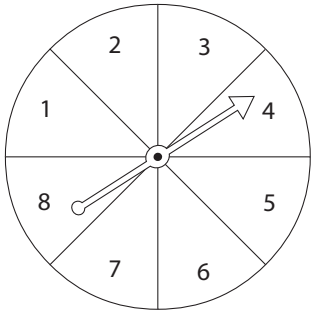
UNIT 7

STUDENT BOOK 5 LESSON

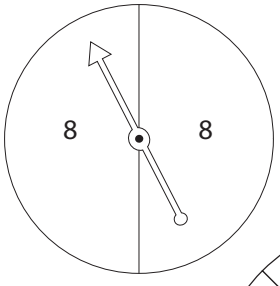
Using Spinners to Compare Likelihoods

Quick Review

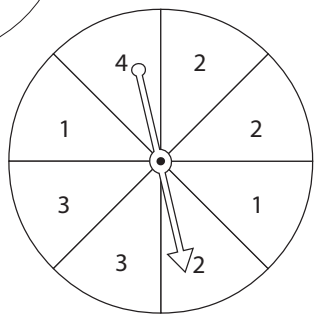
➤ This spinner has 8 equal sectors.
So, there are 8 *possible outcomes*:
landing on 1, 2, 3, 4, 5, 6, 7, 8
Some *impossible* outcomes are:
landing on 9, 10, 11, 12, …



➤ This spinner has 2 equal sectors.
Landing on 8 is *certain*.



➤ This spinner has 8 equal sectors.
Landing on 1 and landing on 3 are *equally likely*.
Landing on 4 is *less likely*
than landing on 1 or 2 or 3.
Landing on 2 is *more likely*
than landing on 1 or 3 or 4.



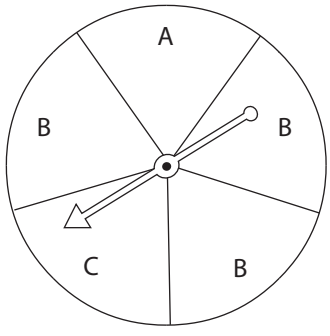
Try These

1. **a)** Which letter is the pointer most likely to land on? _____

b) On which of 2 letters is the pointer equally likely to land on? _____

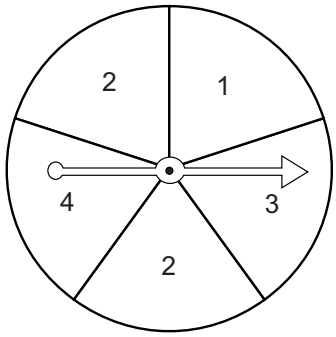
c) Write a statement about the spinner using the words "less likely." _____

_____



Practice

1. Suppose the pointer on this spinner is spun.



a) List the possible outcomes.

_____

b) Compare the likelihoods of the outcomes. Use the words "more likely," "equally likely," or "less likely."

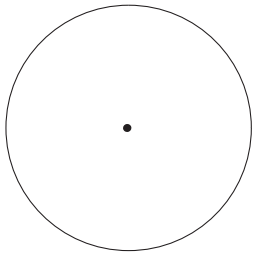
_____

_____

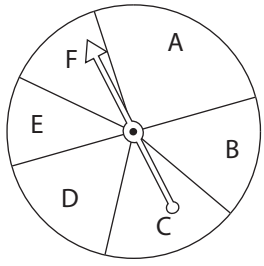
_____

2. Design a spinner so that:

- ➤ Landing on brown is more likely than landing on blue.
- ➤ Landing on orange and landing on green are equally likely.
- ➤ Landing on black is impossible.



3. Yali gets a point if the pointer lands on A, B, or C.
Patsy gets a point if the pointer lands on D, E, or F.
The person with more points after 25 turns wins.



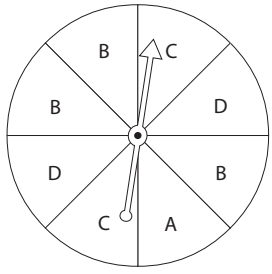
Who is more likely to win? _____

How do you know? _____

_____

Stretch Your Thinking

Suppose you spin the pointer on this spinner. Compare the likelihoods of the outcomes.



_____

_____

_____

_____

UNIT 7

STUDENT BOOK 6 LESSON

Conducting Experiments

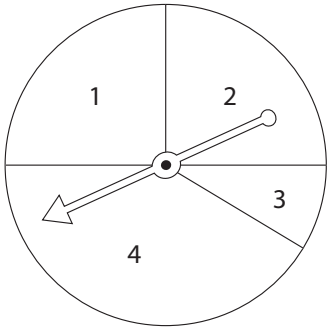
Quick Review

At Home At School

Spinning a pointer on a spinner is an **experiment**.

Lester spins the pointer.
He records the results of each spin in a tally chart.
He conducts the experiment 40 times.

Number	Tally	Total
1		
2		
3		
4		



- Number 3 is on the smallest sector.
  It is less likely that the pointer will land on 3.
- Numbers 1 and 2 are on sectors of the same size.
  Landing on 1 and landing on 2 are equally likely.
- Number 4 is on the largest sector.
  It is more likely that the pointer will land on 4.
- All sectors have a number.
  It is certain that the pointer will land on a number.

Try These

1. Look at the spinner experiment above.

a) Which number is more likely to be landed on—1 or 3? _____

How do you know? _____

_____

b) Which number is less likely to be landed on— 2 or 4? _____

How do you know? _____

c) Which result is more likely— landing on 4 or landing on a number?

_____

Explain. _____

_____

d) Which number will never be landed on? _____

Explain. _____

Practice

1. Work with a partner.
Place 7 blue and 2 green counters in a bag.
Take turns to take a counter from the bag and replace it. Record your results in the tally chart.
Do this 40 times.

Number	Tally	Total
Blue		____
Green		____

a) Which colour counter is more likely to be taken? _____

Do your results match your answer? Explain.

_____

b) Which colour counter is less likely to be taken? _____

Do your results match your answer? Explain.

_____

c) Which colour counter will never be taken? _____

Do your results match your answer? Explain. _____

_____

2. Work with a partner.
Roll a number cube 40 times.
Record your results in the tally chart.
Describe the likelihood of each event:

a) rolling a 4 _____

b) rolling a 10 _____

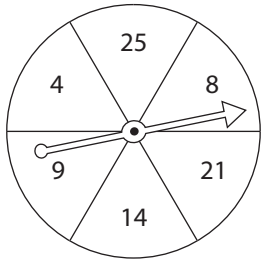
c) rolling a number less than 5 _____

d) rolling a number _____

Number	Tally	Total
1		__
2		__
3		__
4		__
5		__
6		__

Stretch Your Thinking

Player A gets a point if the pointer lands on a multiple of 2.
Player B gets a point if the pointer lands on a multiple of 3.
Player C gets a point if the pointer lands on a multiple of 5.
Who is likely to win? Explain.



_____

_____

UNIT 7

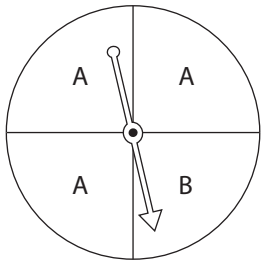
STUDENT BOOK 7 LESSON

Designing Experiments

Quick Review

At Home At School

Geraldine designed an experiment with a spinner.
She designed it so that landing on A was more likely than landing on B.



Sam spun the pointer and recorded the results.
He did this 25 times.
Here are the results.

A	𝍸 𝍸 𝍸 I
B	𝍸 IIII

The pointer landed on A more often than on B.
The experiment turned out the way Geraldine expected.

Try These

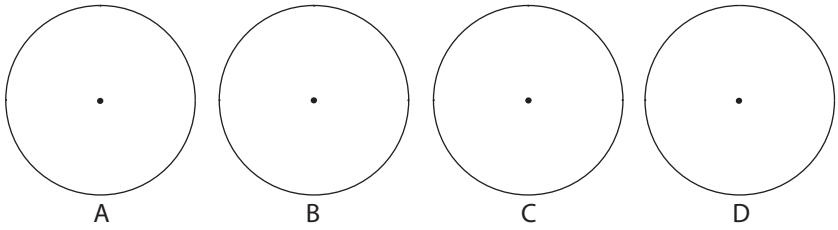
1. Colour each spinner so that:

A landing on red is more likely than landing on yellow.

B landing on green and landing on purple are equally likely.

C landing on brown is impossible.

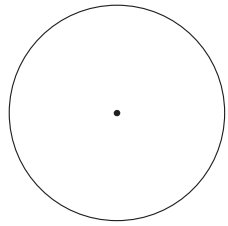
D landing on orange is less likely than landing on blue.



Practice

1. Design a spinner so that:

- The pointer landing on black is least likely.
- The pointer landing on blue is most likely.
- The pointer landing on yellow and landing on green are equally likely.
- The pointer landing on red is impossible.



2. You will need 20 blank cards and a paper bag. An experiment is taking a name card from the paper bag without looking. Design an experiment so that taking a girl's name is more likely than taking a boy's name. Explain what you did. _____

_____

_____

3. Conduct the experiment in question 2 to see if it works the way you expect. Record your results in the tally chart. Write about how well the experiment worked.

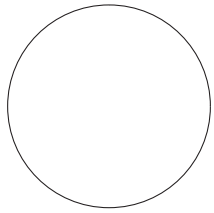
Name	Tally	Total
Boy's		_____
Girl's		_____

_____

_____

Stretch Your Thinking

➤ Colour the spinner using 4 colours. Design an experiment using your spinner. Describe the results you expect.



_____

_____

_____

_____

➤ Conduct the experiment. Did you get the results you expected? Explain.

_____

_____

UNIT 8

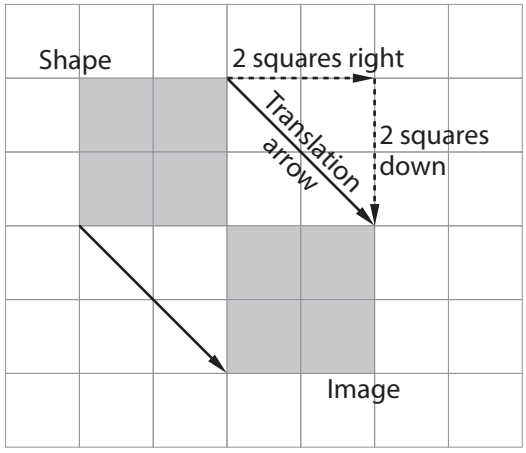
STUDENT BOOK 1 LESSON

Translations

Quick Review

At Home At School

A shape is **translated** when it moves along a straight line from one position to another.
The movement is a **translation**, or a slide.
The shape does not turn.
When we draw the shape in its new position, we draw a **translation image** of the shape.



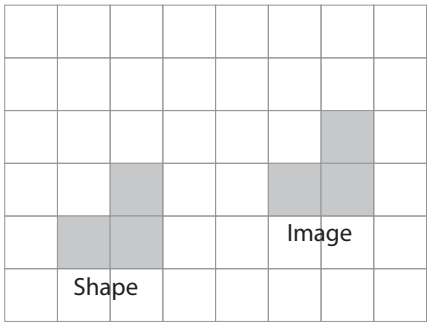
This shape has been translated
2 squares right and
2 squares down.
Whenever you describe a translation, say how many squares left or right, and then say how many up or down.

Translation arrows join matching points on the shape and its **image**.
The shape and its image face the same way.

Try These

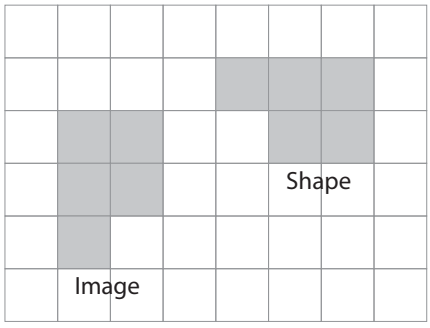
1. Do these pictures show translations? Write *Yes* or *No*.

a)



_____

b)

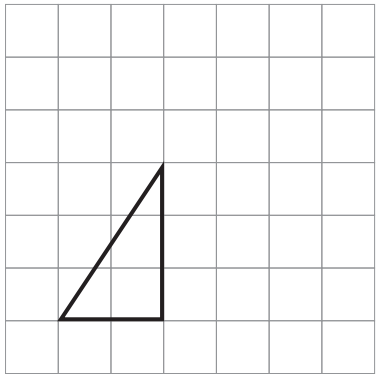


_____

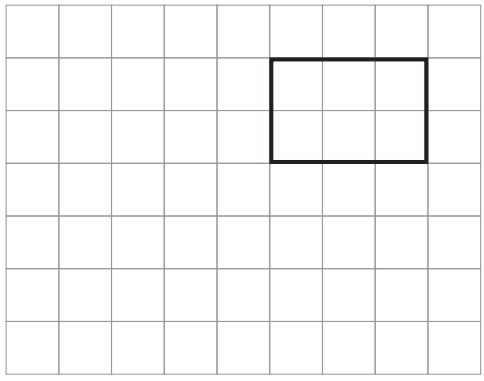
Practice

1. Translate each shape. Draw the image and a translation arrow.

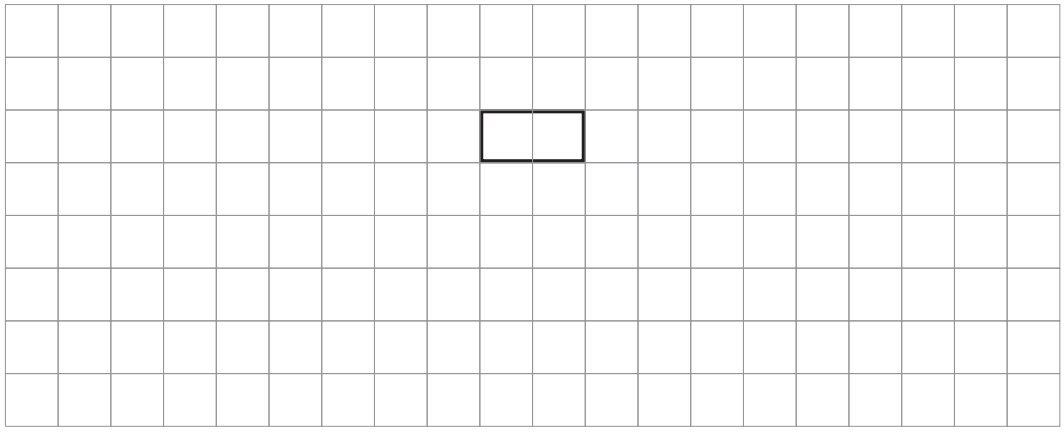
a) 3 squares right and 2 squares up



b) 4 squares left and 2 squares down



2. Translate the shape three times. Draw the images and the translation arrows. Label your translations A, B, and C.



Stretch Your Thinking

How would you describe your translations in question 2?

_____

_____

_____

UNIT 8

STUDENT BOOK 3 LESSON

Reflections

Quick Review

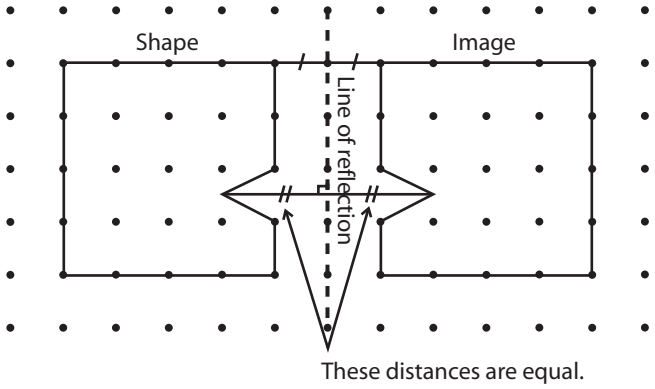
At Home At School

When a shape is *reflected* in a mirror, we see a **reflection image**.

A point and its image are the same distance from the line of reflection.

A shape and its reflection face opposite directions.

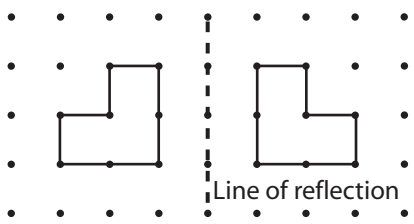
A reflection is sometimes called a *flip*.



Try These

1. Do these pictures show reflections? Write *Yes* or *No*.

a)



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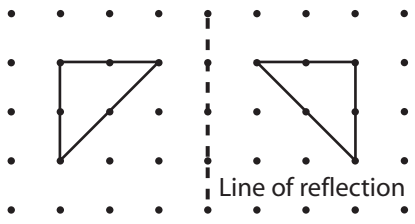
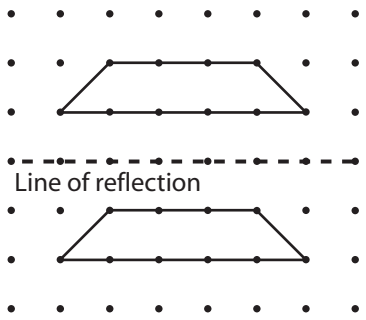
b)



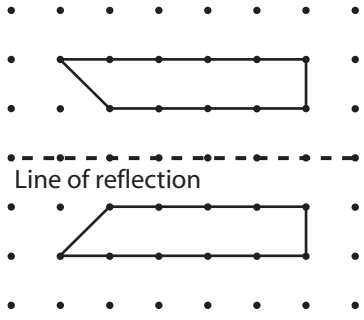
_____

c)



_____

d)

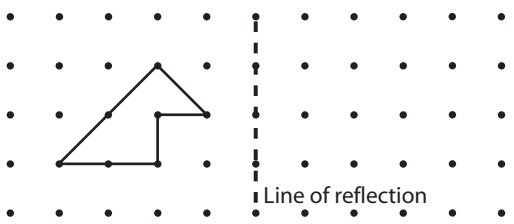


_____

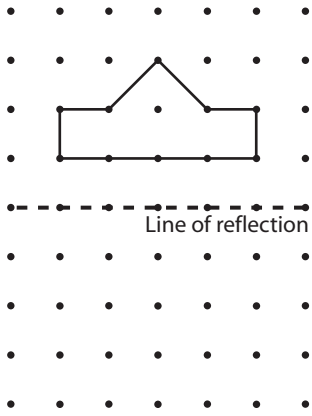
Practice

1. Draw each reflection image.

a)

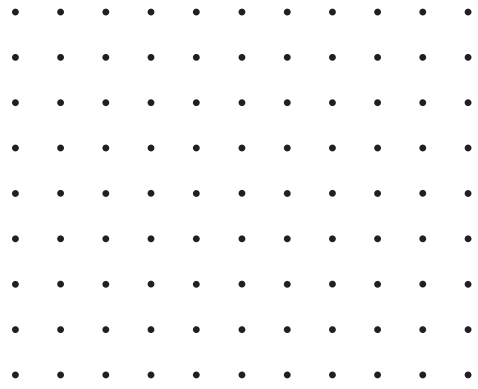


b)

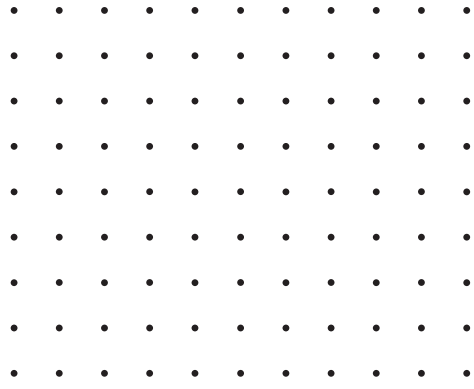


2. Work with a partner.
Draw a line of reflection in part a.
Draw a shape on one side of the line of reflection.
Have your partner draw its reflection image.
Repeat for part b, but switch roles.

a)

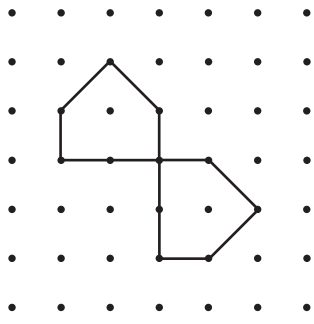


b)



Stretch Your Thinking

The top shape shown here is a reflection image of the bottom shape.
Draw the line of reflection.



UNIT 8

STUDENT BOOK 4 LESSON

Rotations

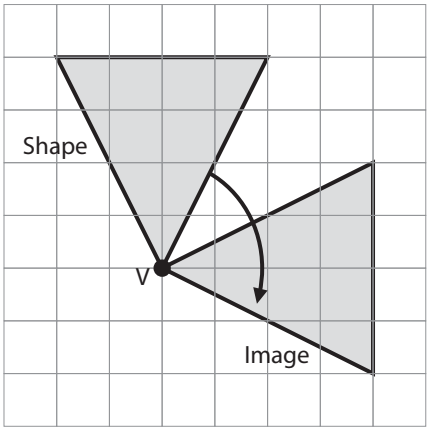
Quick Review

At Home At School

A **rotation** is a turn about a **point of rotation**.

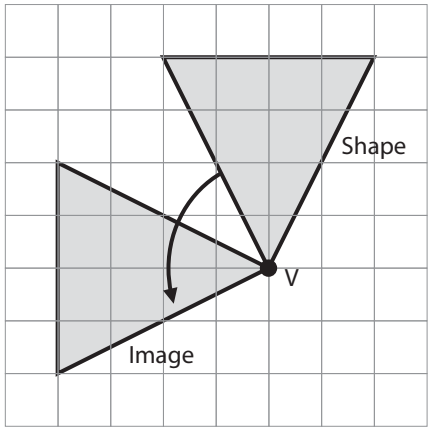
When we show the shape in its new position, we draw a **rotation image** of the shape.

The rotation can be clockwise about a vertex V:



This triangle has rotated a $\frac{1}{4}$ turn clockwise.

The rotation can be counterclockwise about a vertex V.



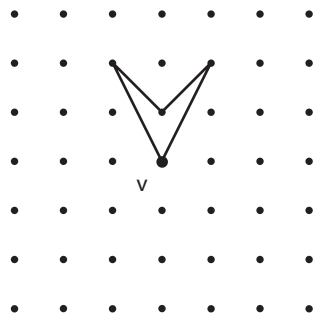
This triangle has rotated a $\frac{1}{4}$ turn counterclockwise.

Translations, reflections, and rotations are all called **transformations**.

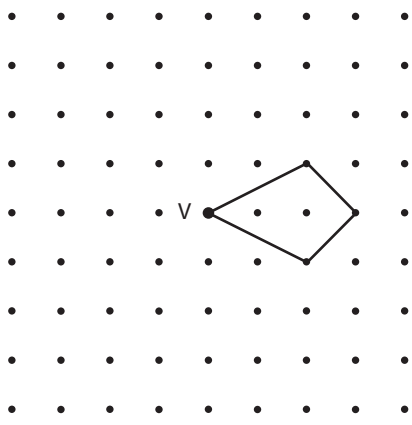
Try These

1. Draw the rotation image of each shape after a $\frac{1}{4}$ turn, a $\frac{1}{2}$ turn, and a $\frac{3}{4}$ turn.

a)



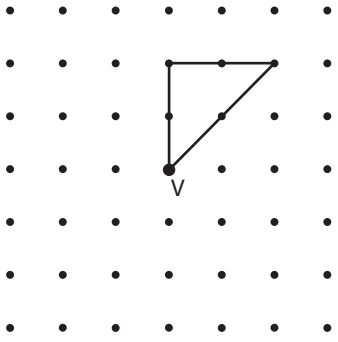
b)



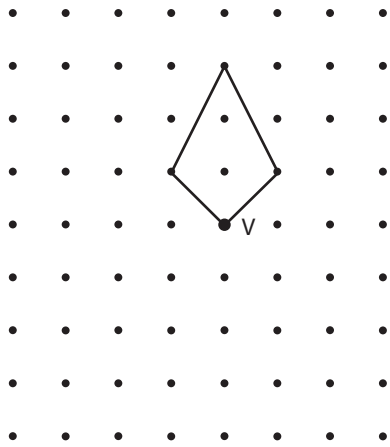
Practice

1. Draw the rotation image of each shape after each rotation.

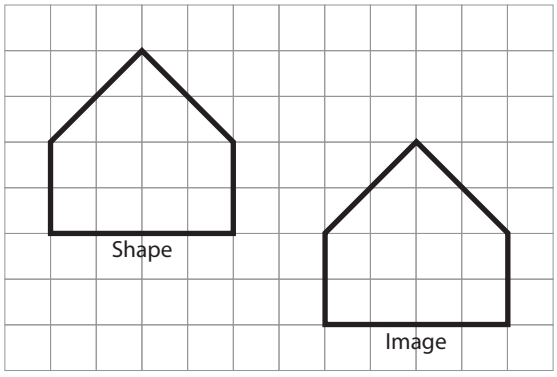
a) $\frac{1}{4}$ turn counterclockwise

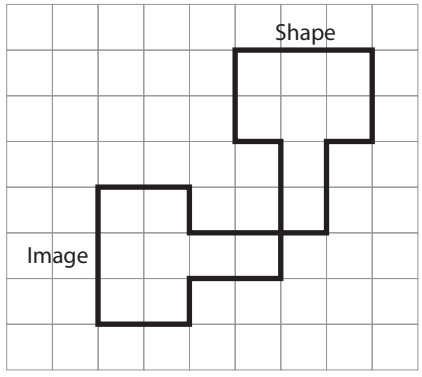


b) $\frac{1}{2}$ turn clockwise



2. Each picture shows a transformation. Name the transformation.





a) _____

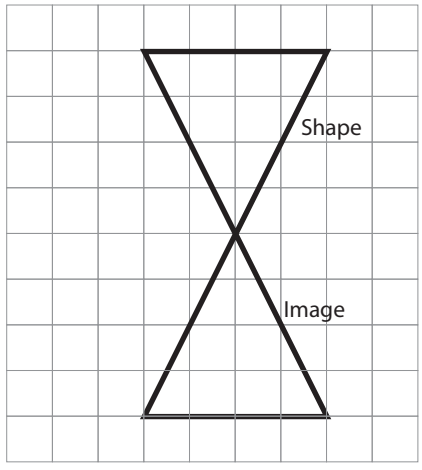
b) _____

Stretch Your Thinking

Can you tell which transformation has been performed? Explain.

_____

_____



UNIT 8

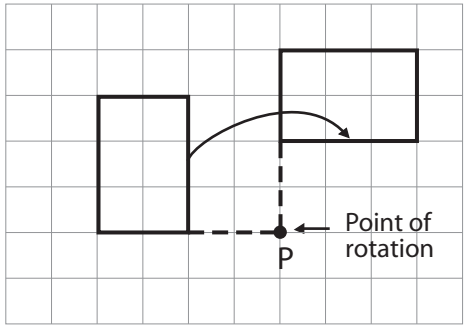
STUDENT BOOK 5 LESSON

Exploring Different Points of Rotation

At Home At School

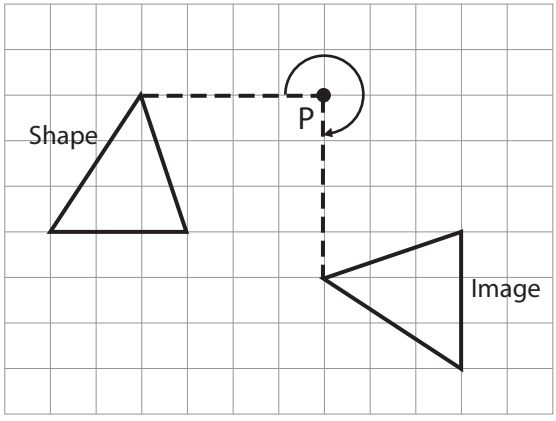
Quick Review

A shape can rotate about a point of rotation that is not on the shape.



We can use tracing paper to find the image when we rotate a shape.

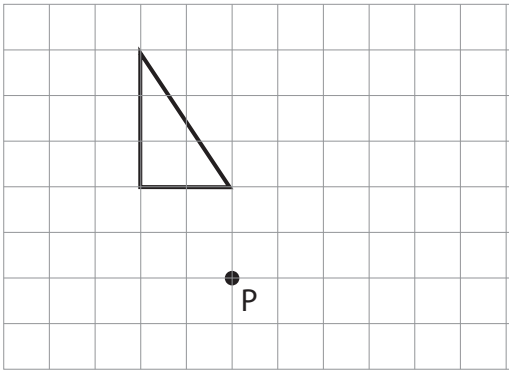
- Place the tracing paper so the top right corner is on point P.
- Trace the shape.
- Hold the tracing paper in place with your pencil at point P. Rotate the tracing paper a $\frac{3}{4}$ turn clockwise.
- Note the position of the rotation image.
- Lift the tracing paper and draw the image in place. Label the image.



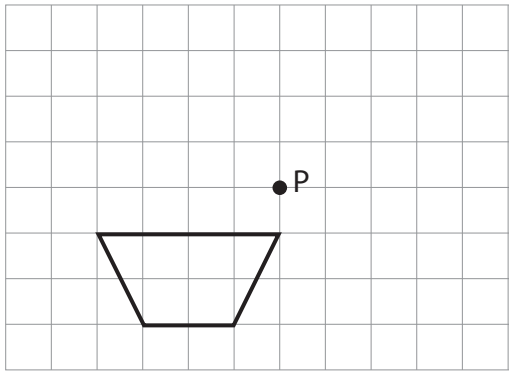
Try These

1. Use tracing paper.
Draw each image after a $\frac{1}{4}$ turn clockwise about point P.

a)



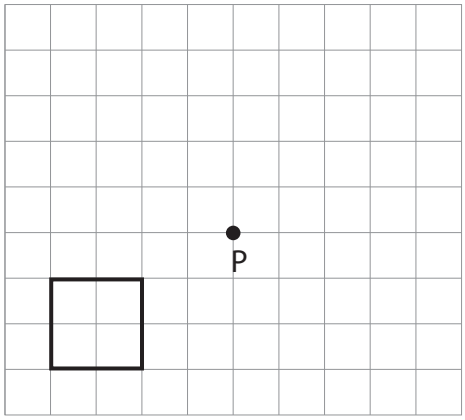
b)



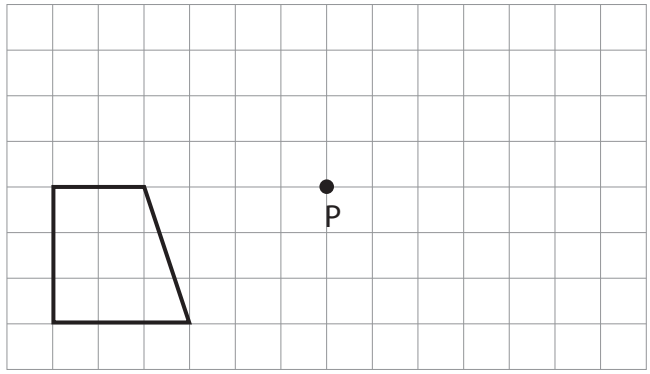
Practice

1. Draw each image after a $\frac{1}{2}$ turn clockwise about point P.

a)

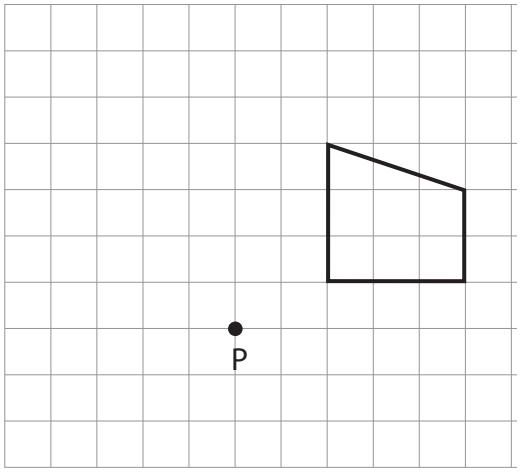


b)

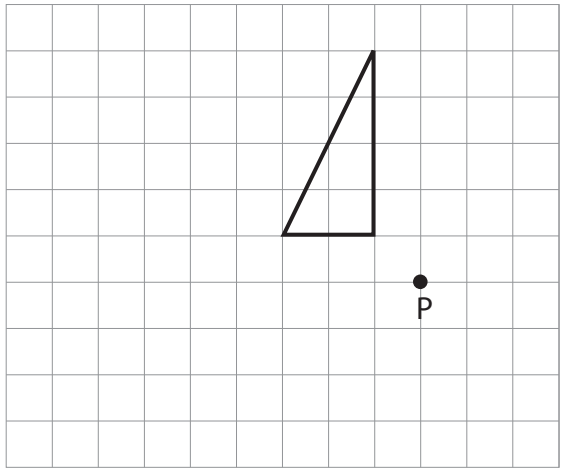


2. Draw each image after a $\frac{1}{4}$ turn counterclockwise about point P.

a)



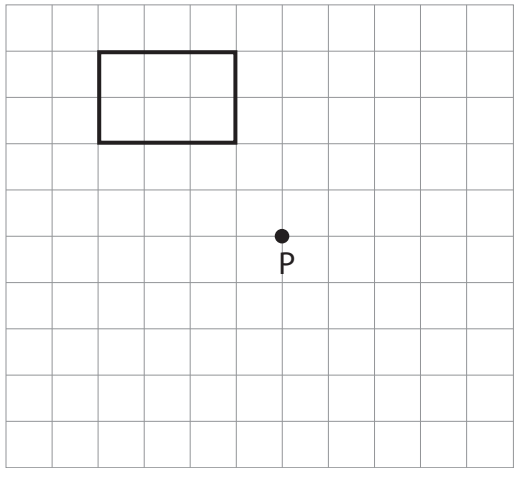
b)



Stretch Your Thinking

Draw the image of the shape after each rotation about point P:

- $\frac{1}{4}$ turn counterclockwise
- $\frac{1}{2}$ turn clockwise
- $\frac{3}{4}$ turn counterclockwise



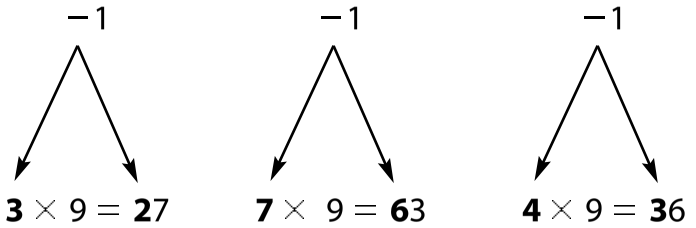
Riddle Me

Homework doesn't always mean sitting at the table with a paper and pencil.

Practise your number sense in the kitchen while supper is cooking, out driving in the car, at the store shopping for groceries, or anywhere at all!

Nifty Nines

Catch the pattern! What do you notice about the tens place in the answer?



But wait… there's more! What do you notice when you add the digits in each answer?

Put these together and you'll never be stumped by 9 × *anything*!

Fold

Math at Home

Numbers in columns, numbers in rows;
Start with a few and watch them grow.
Some say they're tough, but I can't be fooled!
'Cause I hunt for **patterns**... that's *my* secret tool!

I ask myself good questions on my noble pattern quest;
Self, I say, look carefully... What's the diff'?
Where's the rest? Does it grow?
No, wait, it shrinks by 5. Eureka! This is it!
I can solve the puzzle when I find the one that fits!

Math at Home 1

Would You Rather?

Imagine that you just got a new job for 1 month. Your employer gave you a choice of how you would be paid.

1. $5000 for the month
2. 1¢ the first day, then your pay would double each day until the month was up.

You gave it a quick think and, of course, jumped at the first choice… $5000 for just one month is a lot of money!

Did you make a good choice? Check it out!

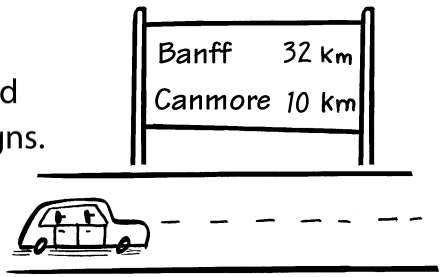
On the Road Again!

You are heading out on another trip!

Is there a pattern to where distance signs are placed along the highway?

Find out by calculating the difference in distance between one sign and the next.

If there is a pattern, it should show up in the next few signs. Does the location make a difference?



Pick Up the Pattern

Here is a pattern of attached triangles made with toothpicks.

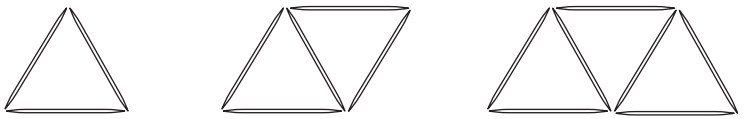


Figure 1 Figure 2 Figure 3

- Use toothpicks to copy and extend the pattern.
- Copy and complete the table.

Figure Number	1	2	3			
Number of Toothpicks						

- Write an expression to represent the pattern in the number of toothpicks.
- Find how many toothpicks would be needed to make the 28th figure.

What do you call people in favour of tractors?

Pro-tractors

Who invented fractions?

Henry the Eighth

Who helped him?

Louis the Sixteenth

Odd One Out

Once you figure out the strategy to guarantee a win, you'll be able to stump just about anyone!

Find a partner, then set out 13 counters (buttons, coins, etc.) in a line. 12 of them must be the same and 1 different.

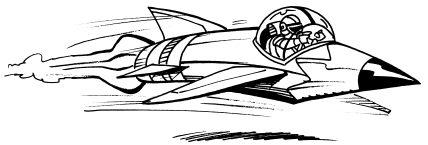
In turn, starting with the first counter, you may take 1 or 2 counters (the choice is yours).

The idea is to not get into a position where you are forced to take the different coloured counter!

Hint: *Work backwards… think about what you DON'T want for a number.*

Ready for another challenge? Try it with 21 counters, where you can take 1, 2, or 3 counters on a turn!

Faster than a Speeding Pencil!



Would you believe that you can multiply all of the numbers on your phone pad together in your head faster than I can do it on a calculator? It's true! But how can that be?

Challenge someone to a duel and try it out! Use what you know about zero.

How Many Are There Really?

×	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

Use what you already know!

Do you really need to memorize…

- Any number × 0? Probably not… cross them off.
- Any number × 1? Probably not… cross them off.
- Any number × 2? That's just like adding doubles.
- Any "turn around" fact (3 × 4 is the "turn around" of 4 × 3)? That gets rid of about half right there!

How many now? Are you surprised?

In the Bag

You'll need:

- a 100-chart (page 5)
- 12 small paper squares numbered 1 to 12
- 20 buttons (10 of one colour and 10 of another)
- a paper bag

The object of this game is to get rid of your buttons first!

- Place all number squares in the paper bag.
- In turn, take three squares from the bag… No peeking!
- Multiply any two or three of the numbers together.

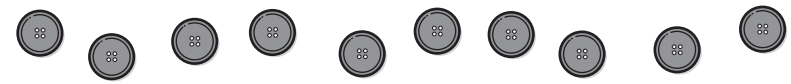
2×5 or 2×8 or $5 \times 2 \times 8$

- With one of your buttons, cover the number on the 100-chart that represents the product you made.
- Now it's the next player's turn.

No two buttons can share the same square.
If you can't play, you'll have to wait for your next turn.

Clean up all of your buttons first and you are the champ!

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



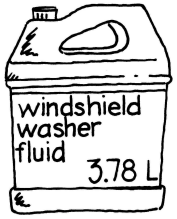
Longing to Belong

Find 3 more numbers that belong in this group.
How do you know they belong?

176	297	363	583	451	396	275

Check It Out!

Find some bottles, jars, jugs, or cans whose capacities are given in millilitres or litres. Make a chart that shows the contents and capacity of each container.



Container	Capacity

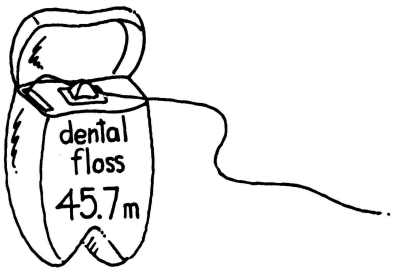
Smart Alec

Alec only had a 3-L pitcher and a 5-L pitcher. He managed to measure out exactly 1 L of cider. How did that smart Alec do it?

Floss Those Pearly Whites!

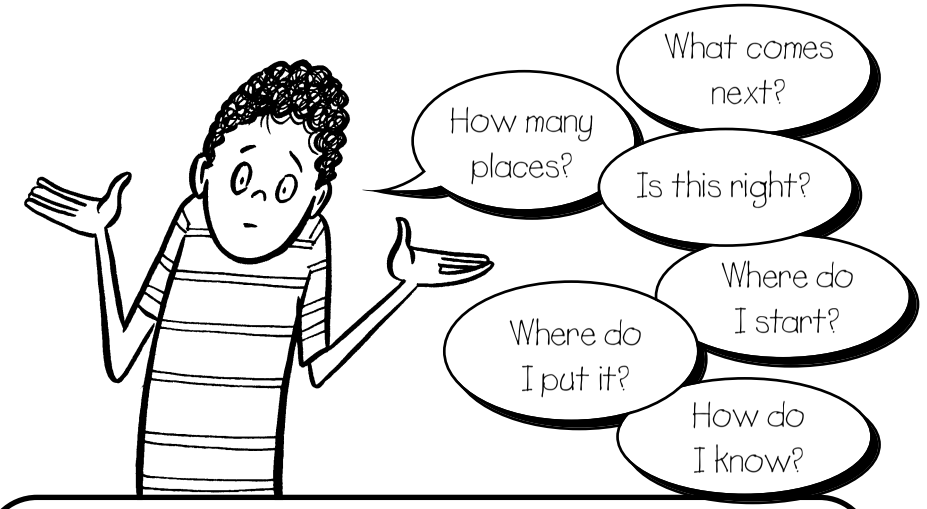
Suppose you use 30 cm of dental floss each day.

How many of these containers of floss will you use in a year?



Fold

Math at Home



Kids Rule!

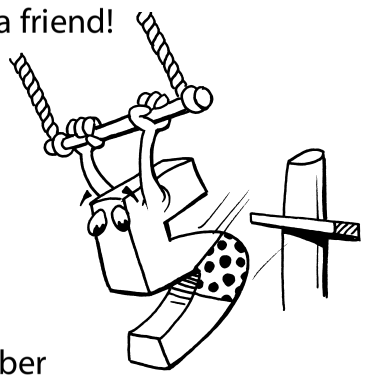
Rules! Rules! Rules! How do I keep them straight?
Was it this or was it that? Do it now? Or should I wait?
First I'm sure and then I'm not; my brain can sure get muddled.
Which rule is right for the job at hand?
Sometimes I feel befuddled!

But, ah... that's how it *used* to be, before I was this wise.
Then I worked with blocks and rods, 'til right before my eyes
My OWN rules began appearing through my new math lens.
Remembering is never a problem now...
'Cause now my Math Makes Sense!

Math at Home 2

Mathematics Acrobatics

Try this number trick out on a friend!



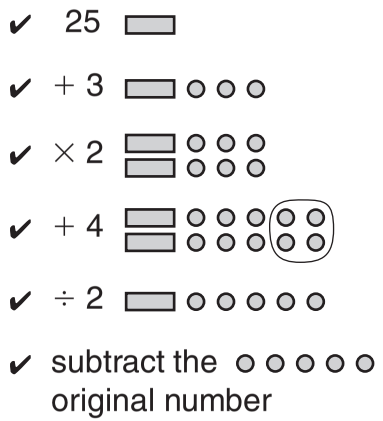
Ask her to…

- ➤ choose a number
- ➤ add 3
- ➤ multiply by 2
- ➤ add 4
- ➤ divide by 2
- ➤ subtract the original number

Now tell your friend that her answer is **5**!

Aren't you amazing! Does it work with any number? What about decimal numbers?

You can make up your own number tricks if you understand how they work… "Mind pictures" can help!



Now make up some of your own!

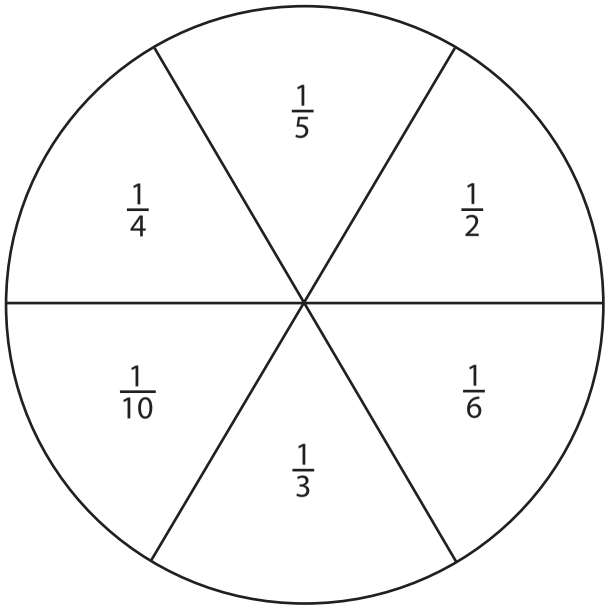
Fraction Action

You'll need:

- ➤ 24 counters for each player
- ➤ paper clip to use as a pointer

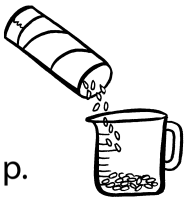
The object of the game is to have the most counters after 10 turns.

- ➤ In turn, spin the pointer on the spinner. Name the fraction.
- ➤ If you can take exactly that fraction of your opponent's counters, take them and add them to your pile.
- ➤ If you can't take the exact fraction, don't take any counters.
- ➤ Play for 10 rounds.



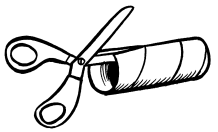
Varying Volumes

The next time you have an empty paper towel tube, try this experiment!



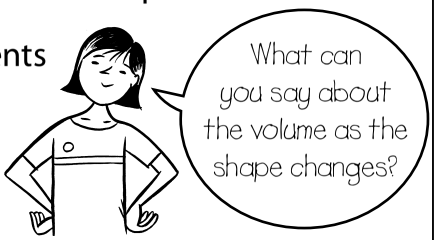
- ➤ Cover one end of the tube with tape.
- ➤ Fill the tube with rice or beans.
- ➤ Pour the contents into a measuring cup.

- ➤ Cut the tube along its length and lay it flat. It should look like a rectangle. Mark the top and bottom edges.



- ➤ Now roll it back up from bottom to top and tape it up. Don't forget to seal one end with tape.

Can you pour all of the contents of the measuring cup into your new container? Is there room to spare?



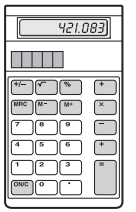
Fractured Fractions

How many different fractions less than 1 can you make with these numbers?

9 7 5 1 3

$$\frac{\square}{\square}$$

Bring It to Zero!



You'll need:

- ➤ 2 or more players
- ➤ a calculator

The object of this game is to bring each of the digits to 0 in the fewest number of moves.

Enter any 6-digit number into your calculator. You must have at least 3 decimal places and each digit must be different.

In turn, players choose any digit within that number and subtract whatever number they think will bring that digit to 0.

Once you have entered (=), your turn is done and the calculator is passed to the next player. That player may then either choose a different digit, or work on the same one. The player to get the last 0 wins that round!

Now try it the other way!
Enter a 6-digit number below 500 and take turns **adding** to each digit. The first player to get to **1000** wins!

Think about It!

Is there enough in a small container of dental floss to go all the way around your room? More than once?

How can you tell without unrolling it?

Roll to a Whole!

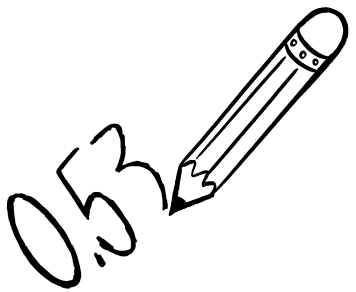
You'll need:

- 2 number cubes
- 2 copies of the grid on page 5
- crayons or markers

The goal is to be the first to colour one whole grid.

On your turn:

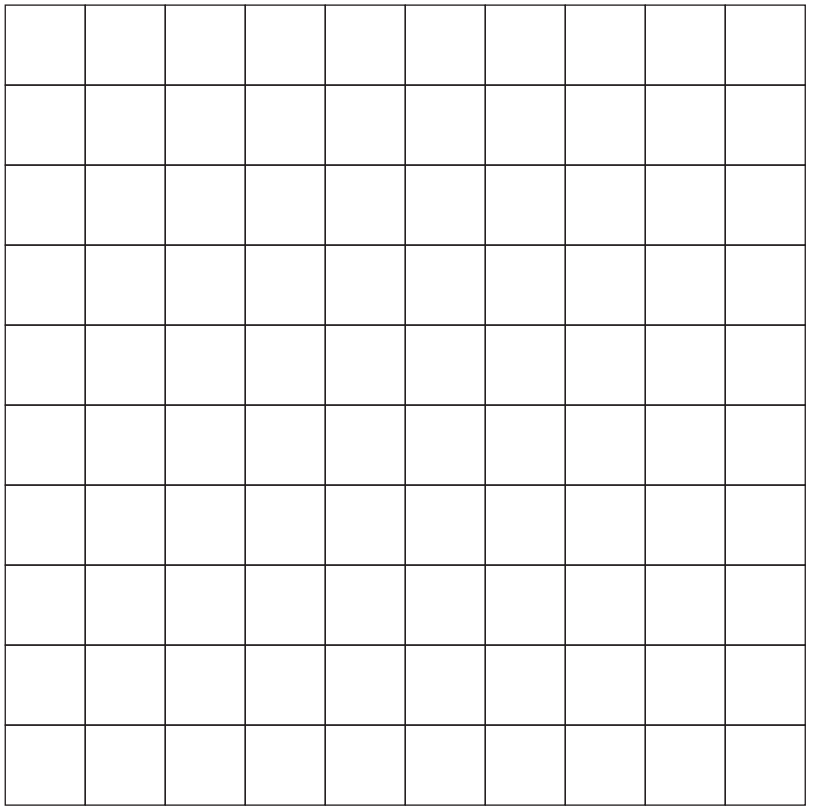
- Roll one number cube. This will tell you how many tenths you may colour on your grid.
- Roll the second number cube. This will tell you how many hundredths you may colour on your grid.
- Colour them and say how much of your whole grid is coloured.
- Record that decimal number on a piece of paper and… that's the end of your turn!



Does it sound too easy?
Here are a couple rules you must obey:

1. If you forget to say your decimal number aloud, your partner gets an extra turn.
2. If you roll doubles, you must colour that amount on the other player's grid.

Colour your grid first to be the decimal champ!

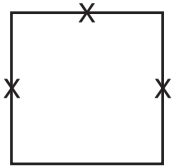


Trace this grid to make additional copies.

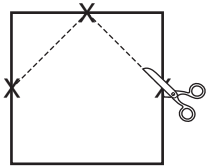
Bonus!
If you can also say how much of your grid is left to colour, give yourself a bonus of 5 more hundredths.

Super Squares

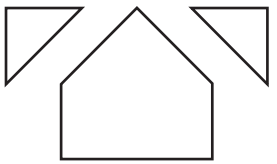
Draw a nice neat square and mark 3 midpoints.



Connect the points as shown and cut along those lines.



You'll be left with a pentagon and 2 triangles.



How many different shapes can you make with these 3 pieces? Can you make one that looks like an animal? Describe each shape by telling about its attributes.

Mirror, Mirror…

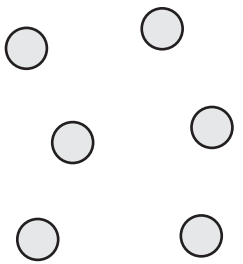
Where could you place a straight-sided mirror so that you could see:

2 circles?

4 circles?

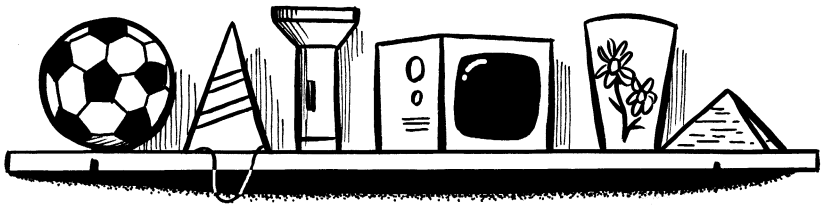
6 circles?

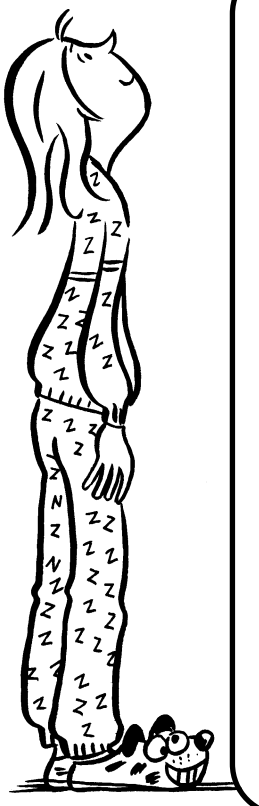
more circles?



Fold

Math at Home





Distractions in 3-D

There's nowhere I can look around
And not see three-dimensional!
I see a prism in a tissue box
An accident? Or intentional?

My hamper is rectangular,
The TV is a cube.
Wait! Do I see a cylinder
In that left-over paper tube?

My closet is a virtual kingdom in 3-D
That hockey puck, my soccer ball,
A hat from Lee's party!

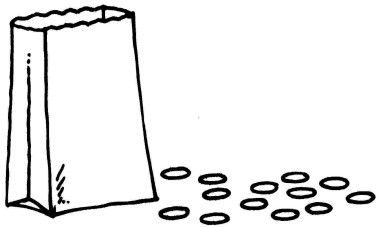
My bedposts are all pyramids
Of the hexagonal family.
I can't escape this madness!
These distractions in 3-D!

Math at Home 3

Bag It!

You'll need:

- a paper bag
- coloured counters or buttons



Suppose you take one counter from the bag without looking, then replace it.
Design an experiment so that:

- You are more likely to take a green counter than a blue counter.
- Taking white is impossible.
- Taking a green counter and taking a red counter are equally likely.

How many counters of each colour would you put in the bag?

Conduct your experiment. Record your results.

Why did the triangle always go to the square for advice?

Because he always had the right angle on things!

What did one decimal say to the other?

Get the point?

Do you know what I find odd in math?

Numbers not divisible by 2!

As the Shape Turns

Work with a partner.

Take turns:

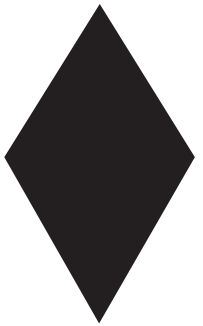
- Draw a shape on the grid.
  Choose a point outside the shape.
  Rotate the shape about the point.
  Draw its rotation image.
- Have your partner identify the rotation, including:
  – the point of the rotation
  – the fraction of the turn
  – the direction of the turn.

Mix Them Up!

You'll need:

- copies of the rhombus shown below (15 for each player)
- a number cube

The object of this game is to be the first to clear away all of your pieces.



Trace and cut out copies of this rhombus.

To begin, each player joins rhombuses to build 5 hexagons.

On your turn:

- Roll the number cube. This will tell you **how many rhombuses** you may discard.
- Tell how much is left. You must say it 2 ways.

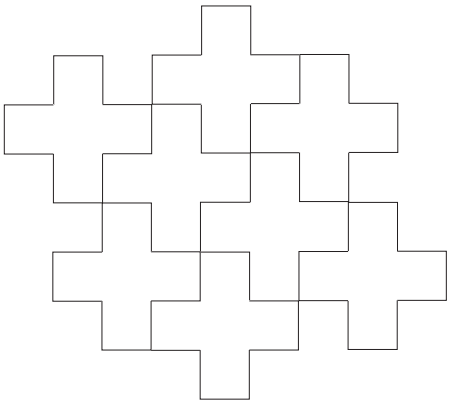
Special Rules

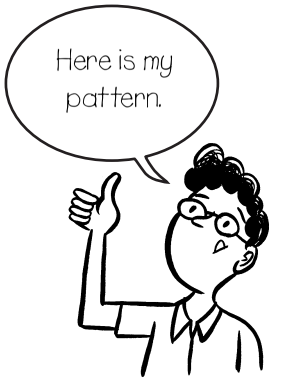
1. If you roll a 6, miss your turn.
2. If you roll a 3, give the other player 3 rhombuses to add to his or her collection.
3. If you forget to say how much is left, take 2 rhombuses from the other player.

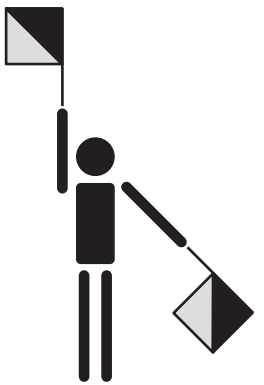
First to clean up wins!

Design It!

Draw a polygon on light cardboard.
Cut out your polygon.
Create a design by flipping, sliding, and turning the polygon.
The images should touch but not overlap.
Colour your design. Make it as attractive as you can.







Who Knew?

Semaphore is an alphabet signalling system based on holding flags, with the arms at different angles, to represent letters or numbers.

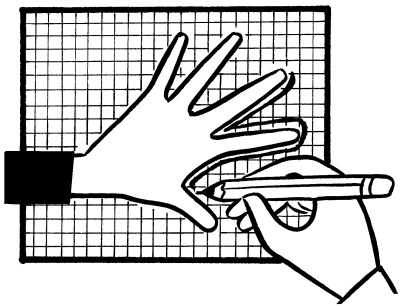
Look up the code on the web. What words can you make with only acute angles?

I Wonder…

Do people with the biggest hands also have the biggest feet?

Conduct your own survey to find out!

- ➤ Make some copies of the 1-cm grid on page 5 (or use graph paper).
- ➤ Find some willing participants.
- ➤ Trace each person's hand and foot on the grid (you may have to join sheets together).



What is the area of each hand and each foot? How will you count the part-squares?

Displaying your information in a double bar graph will give you an **instant picture** of the answer!

Show your graph to someone and tell them what you've found out!