SEACREST
COUNTRY DAY SCHOOL

Rising 6th Grade Summer Packet

Name: _____

Please show ALL work to receive full credit.

The work in this packet is taken from the "Recall Prior Knowledge" sections in the 6th grade math textbook. It is designed to help students review key concepts that will support their success in next year's course. While much of the content reinforces material already covered, some topics may be unfamiliar. This is intentional and meant to give students a preview of upcoming concepts and an opportunity to stretch their thinking. We encourage students to try their best, and it's completely okay if they don't master every problem—just attempting the work is a valuable part of the learning process.

Have a great summer doing math!

SEACREST
COUNTRY DAY SCHOOL

June 2025

There are 6 chapter reviews to complete in June. Suggested pacing is below:

June 2-6:	Chapter 1-2
June 9-13:	Chapter 3-4
June 16-20:	Chapter 5
June 23-27:	Chapter 6

Chapter 1

Whole Numbers, Prime Numbers, and Prime Factorization

How many guests?

Have you ever organized a party? How did you decide how many guests to invite? Did you calculate the cost of assorted room decorations, and the number of tables and chairs your guests might need? How did you decide how much food to prepare?

Perhaps you decided that your guests would enjoy a variety of finger foods. Suppose you considered preparing 80 sandwiches and 60 miniature pies. If each person ate the same amount of each finger food, how many guests could you feed? Your answer told you how many guests you could invite.

In this chapter, you will learn how to use prime factorization and greatest common factors to answer a variety of questions like these.

How do you express a whole number as a product of its factors?

RECALL PRIOR KNOWLEDGE

Name: _____ Date: _____

Finding factors of a whole number

Find the factors of 24.

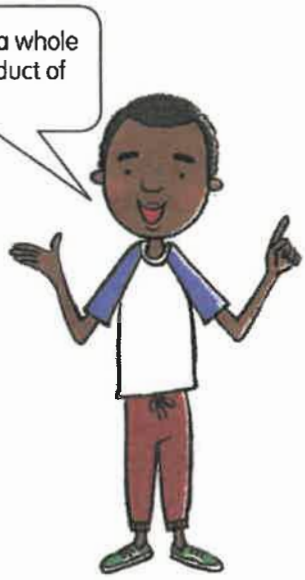
$24 = 1 \times 24$

$24 = 2 \times 12$

$24 = 3 \times 8$

$24 = 4 \times 6$

The factors of 24 are 1, 2, 3, 4, 6, 8, 12, and 24.



Quick Check

Find the factors of each number.

1. 30

2. 63

3. 56

4. 84

Finding multiples of a whole number

Find the first six multiples of 7.

1 × 7 = 7

2 × 7 = 14

3 × 7 = 21

4 × 7 = 28

5 × 7 = 35

6 × 7 = 42 ...

7, 14, 21, 28, 35, and 42 are the first six multiples of 7.

Quick Check

Find the first five multiples of each number.

5 4

6 6

7 9

8 13

RECALL PRIOR KNOWLEDGE

Identifying prime numbers

A prime number has only two different factors, 1 and the number itself.
Decide whether 11 and 14 are prime numbers.

Find the factors of 11.

$11 = 1 \times 11$

The factors of 11 are 1 and 11.
11 is a prime number.

Find the factors of 14.

$14 = 1 \times 14$
$14 = 2 \times 7$

The factors of 14 are 1, 2, 7, and 14.
14 is not a prime number.

Quick Check

Identify all the prime numbers in the following set of numbers.

9 2, 5, 13, 21, 23, 39, 47, 51, 53, 57

Using order of operations to simplify numerical expressions

STEP 1 Evaluate inside parentheses.

STEP 2 Multiply and divide from left to right.

STEP 3 Add and subtract from left to right.

Find the value of $(98 + 34) - 6 \times 7$.

$(98 + 34) - 6 \times 7$ Perform operations inside parentheses.
$= 132 - 6 \times 7$ Multiply.
$= 132 - 42$ Subtract.
$= 90$

Quick Check

Find the value of each expression.

10 $(40 - 28) + 8 \times 7$

11 $75 \times (45 \div 5) - 70$

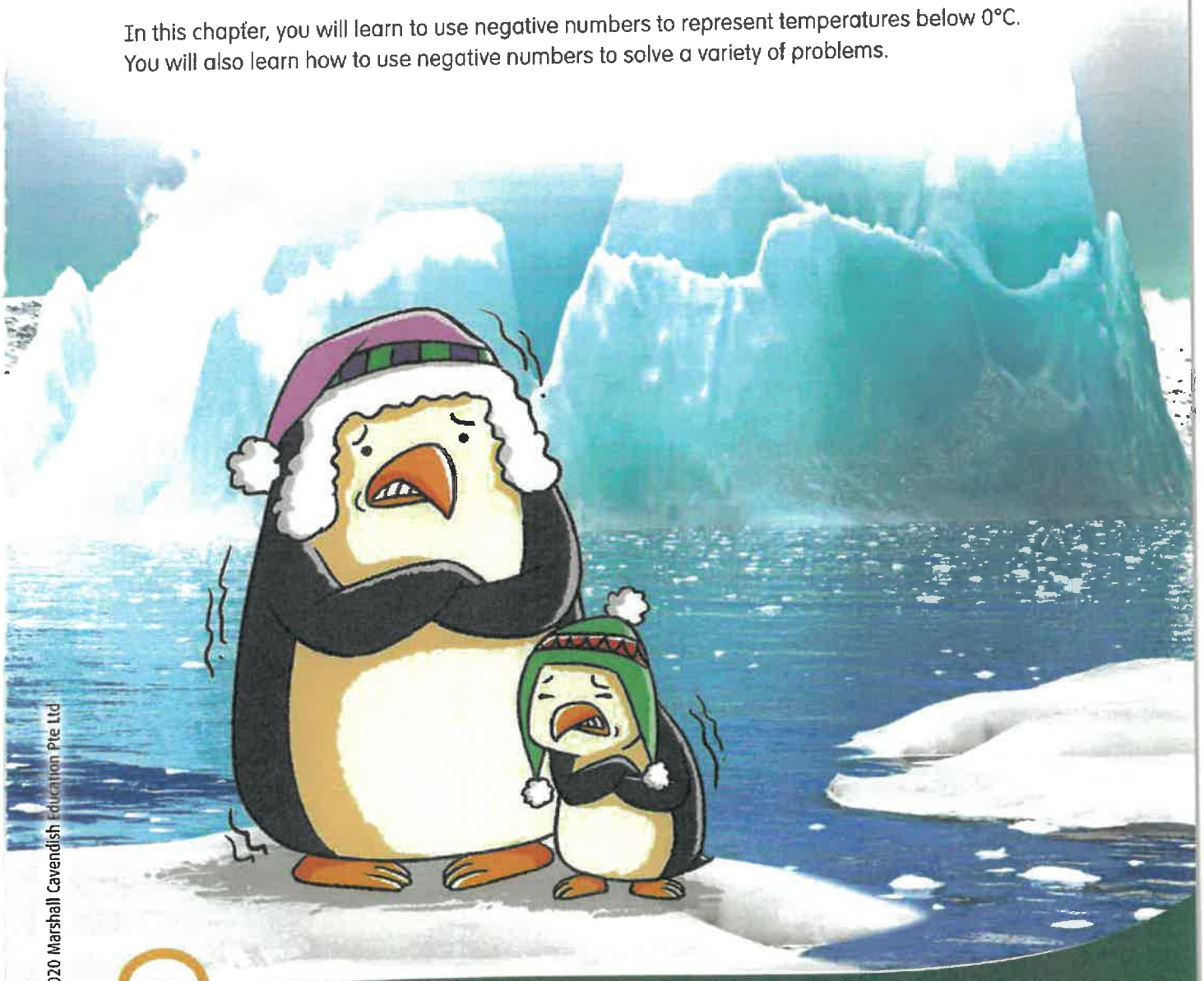
Chapter 2

Number Lines and Negative Numbers

How cold is an iceberg?

How cold must ocean water be before an iceberg forms? Freshwater freezes at 0°C, but salt water has a lower freezing point. So, icebergs form when the temperature is below 0°C. The temperature in Antarctica, where many icebergs form, is usually below 0°C. Have you experienced temperatures below 0°C? How do you express the temperatures?

In this chapter, you will learn to use negative numbers to represent temperatures below 0°C. You will also learn how to use negative numbers to solve a variety of problems.



How do you express and compare numbers less than 0?

RECALL PRIOR KNOWLEDGE

Name: _____ Date: _____

Comparing numbers to 1,000,000

a Which is greater, 135,000 or 153,000?

Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
1	3	5	0	0	0
1	5	3	0	0	0

The hundred thousands are the same.

Compare the ten thousands.
5 ten thousands are greater than 3 ten thousands.

So, 153,000 is greater than 135,000.
153,000 > 135,000

b Which is less, 261,000 or 264,000?

Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
2	6	1	0	0	0
2	6	4	0	0	0

The hundred thousands and ten thousands are the same.

Compare the thousands.
1 thousand is less than 4 thousands.

So, 261,000 is less than 264,000.
261,000 < 264,000

Quick Check

Compare each pair of numbers using > or <.
Use a place-value chart to help you.

1. 33,260 ○ 34,649
2. 51,707 ○ 51,077
3. 480,000 ○ 408,999
4. 600,123 ○ 605,321

Chapter

3 Fractions and Decimals

What do architects do?

Architects design buildings, and they have a lot to think about. They must choose all of the materials they need to build a structure from the ground up. They calculate quantities of every item, from the smallest nail to the largest sheet of steel.

Many buildings have wooden skeletons. The vertical bones in the skeleton are called studs. Architects figure out how many studs they need and how far apart they should stand. They must be the right size and in the right quantity to support a building. Calculations often include fractions and decimals.

In this chapter, you will work with fractions and decimals, and learn skills that you will find useful in solving many real-world problems.

How do you add, subtract, multiply, or divide fractions and decimals?

RECALL PRIOR KNOWLEDGE

Name: _____ Date: _____

Adding and subtracting decimals

a
$$\begin{array}{r} 3.8 \\ +\ 2.1 \\ \hline 5.9 \end{array}$$

b
$$\begin{array}{r} {\scriptstyle 1\ \ 1\ \ \ } \\ 7.86 \\ +\ 4.75 \\ \hline 12.61 \end{array}$$

c
$$\begin{array}{r} 8.26 \\ -\ 7.03 \\ \hline 1.23 \end{array}$$

d
$$\begin{array}{r} {\scriptstyle 5\ \ 10\ 10} \\ 6.10 \\ -\ 2.34 \\ \hline 3.76 \end{array}$$

Quick Check

Add or subtract.

1. 5.3 + 6.49

2. 6.51 – 2.03

3. 9.62 + 7.08

4. 8.4 – 7.52

Expressing improper fractions as mixed numbers

$\frac{16}{5} = \frac{15}{5} + \frac{1}{5}$ Rewrite as a sum.

$= 3 + \frac{1}{5}$ Write the improper fraction as a whole number.

$= 3\frac{1}{5}$ Write the sum as a mixed number.

Quick Check

Express each improper fraction as a mixed number in simplest form.

5. $\frac{19}{3}$

6. $\frac{26}{4}$

7. $\frac{30}{7}$

8. $\frac{38}{5}$

9. $\frac{50}{8}$

10. $\frac{69}{9}$

Expressing mixed numbers as improper fractions

$2\frac{5}{6} = 2 + \frac{5}{6}$ Rewrite as a sum.

$= \frac{12}{6} + \frac{5}{6}$ Write the whole number as a fraction.

$= \frac{17}{6}$ Write the sum as an improper fraction.

Quick Check

Express each mixed number as an improper fraction.

11 $3\frac{1}{4}$ 12 $4\frac{3}{7}$ 13 $8\frac{5}{9}$

Multiplying fractions by fractions

Method 1

$\frac{3}{4} \times \frac{2}{9} = \frac{3 \times 2}{4 \times 9}$ Multiply the numerators. Multiply the denominators.

$= \frac{6}{36}$ Simplify the products.

$= \frac{1}{6}$ Write the fraction in simplest form.

Method 2

$\frac{3}{4} \times \frac{2}{9} = \frac{\overset{1}{\cancel{3}}}{\underset{2}{\cancel{4}}} \times \frac{\overset{1}{\cancel{2}}}{\underset{3}{\cancel{9}}}$ Divide 3 and 9 by their common factor, 3. Divide 2 and 4 by their common factor, 2.

$= \frac{1 \times 1}{2 \times 3}$ Multiply the numerators. Multiply the denominators.

$= \frac{1}{6}$ Simplify the products.

Quick Check

Multiply. Write each product in simplest form.

14 $\frac{2}{5} \times \frac{7}{8}$ 15 $\frac{5}{9} \times \frac{6}{7}$

RECALL PRIOR KNOWLEDGE

16 $\frac{10}{11} \times \frac{33}{5}$

17 $\frac{8}{7} \times \frac{35}{12}$

Dividing fractions by a whole number

Method 1

$\frac{2}{3} \div 4 = \frac{1}{\cancel{4}_{2}} \times \frac{\overset{1}{\cancel{2}}}{3}$ Write as a multiplication expression. Divide 2 and 4 by their common factor, 2.

$= \frac{1}{6}$ Multiply.

Method 2

$\frac{2}{3} \div 4 = \frac{\overset{1}{\cancel{2}}}{3} \times \frac{1}{\cancel{4}_{2}}$ Write as a multiplication expression. Divide 2 and 4 by their common factor, 2.

$= \frac{1}{6}$ Multiply.

Quick Check

Divide. Write each quotient in simplest form.

18 $\frac{3}{4} \div 6$

19 $\frac{4}{5} \div 10$

Dividing whole numbers by a unit fraction

$2 \div \frac{1}{4} = 2 \times 4$ Write as a multiplication expression.

$= 8$ Multiply.

Quick Check

Divide. Write each quotient in simplest form.

20 $5 \div \frac{1}{3}$

21 $8 \div \frac{1}{8}$

Chapter 4

Ratio

What is the math in cooking?

When was the last time you read a new recipe? Perhaps you wanted to make a loaf of bread. The recipe you found tells you how much of each type of ingredient to use. You needed 1 cup of buttermilk and 3 cups of flour to make a loaf of bread. The ratio 1 to 3 describes the relationship between the number of cups of buttermilk and the number of cups of flour in the bread.

Now, suppose you want to make 5 loaves of bread. You need to increase the number of cups of buttermilk and the number of cups of flour you use. How many cups of buttermilk will you need? How many cups of flour will you need?

In this chapter, you will learn how to use ratios to solve problems like "scaling up" the ingredients you need in a recipe.

How does the use of ratio help you compare quantities?

RECALL PRIOR KNOWLEDGE

Name: _____ Date: _____

Expressing fractions as equivalent fractions by multiplication

$\frac{5}{7} = \frac{5 \times 2}{7 \times 2} = \frac{10}{14}$ Multiply both the numerator and denominator by the same number, 2.

$\frac{5}{7} = \frac{5 \times 3}{7 \times 3} = \frac{15}{21}$ Multiply both the numerator and denominator by the same number, 3.

$\frac{5}{7} = \frac{10}{14} = \frac{15}{21}$

So, $\frac{5}{7}$, $\frac{10}{14}$, and $\frac{15}{21}$ are equivalent fractions.

Quick Check

Express each fraction as two equivalent fractions using multiplication.

1. $\frac{3}{4}$
2. $\frac{7}{9}$
3. $\frac{6}{11}$

Expressing fractions as equivalent fractions by division

$\frac{18}{36} = \frac{18 \div 3}{36 \div 3} = \frac{6}{12}$ Divide both the numerator and denominator by the common factor, 3.

$\frac{18}{36} = \frac{18 \div 6}{36 \div 6} = \frac{3}{6}$ Divide both the numerator and denominator by the common factor, 6.

$\frac{18}{36} = \frac{6}{12} = \frac{3}{6}$

So, $\frac{18}{36}$, $\frac{6}{12}$, and $\frac{3}{6}$ are equivalent fractions.

Quick Check

Express each fraction as two equivalent fractions using division.

4. $\frac{16}{56}$
5. $\frac{21}{63}$
6. $\frac{35}{140}$

Writing equivalent fractions

Find the unknown numerator or denominator in each pair of equivalent fractions.

a $\frac{4}{7} = \frac{?}{42}$

$\frac{4}{7} = \frac{4 \times 6}{7 \times 6}$

$= \frac{24}{42}$

b $\frac{5}{12} = \frac{35}{?}$

$\frac{5}{12} = \frac{5 \times 7}{12 \times 7}$

$= \frac{35}{84}$

Quick Check

Find the unknown numerator or denominator in each pair of equivalent fractions.

7 $\frac{3}{8} = \frac{\quad}{56}$

8 $\frac{7}{9} = \frac{21}{\quad}$

9 $\frac{\quad}{11} = \frac{30}{55}$

10 $\frac{6}{\quad} = \frac{42}{84}$

Writing fractions in simplest form

$\frac{12}{16} = \frac{12 \div 4}{16 \div 4}$ Divide both the numerator and denominator by the greatest common factor, 4.

$= \frac{3}{4}$

Quick Check

Express each fraction in simplest form.

11 $\frac{5}{45}$

12 $\frac{18}{63}$

13 $\frac{22}{55}$

Converting measurements given in one unit of measure to another

Find the unknown measurement.

a $\underline{\quad ? \quad}$ in. = 3 ft

1 ft = 12 in.
3 ft = 3 × 12
= 36 in.

b 5.2 km = $\underline{\quad ? \quad}$ m

1 km = 1,000 m
5.2 km = 1,000 × 5.2
= 5,200 m

RECALL PRIOR KNOWLEDGE

Quick Check

Find each unknown measurement.

14 _____ cm = 4 m

15 9.8 kg = _____ g

16 6 ft = _____ yd

17 10 L = _____ mL

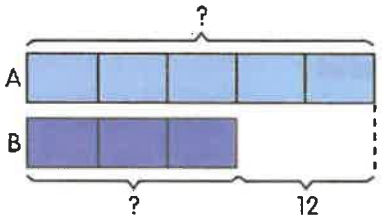
18 _____ yd = 72 in.

19 5 lb = _____ oz

Interpreting a comparison bar model

Find the values of A and B.

a

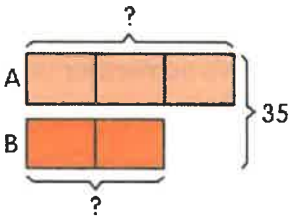


2 units = 12
1 unit = 12 ÷ 2
= 6

Value of A:
5 units = 6 × 5
= 30

Value of B:
3 units = 6 × 3
= 18

b



5 units = 35
1 unit = 35 ÷ 5
= 7

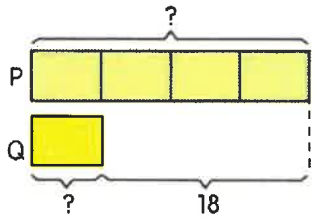
Value of A:
3 units = 7 × 3
= 21

Value of B:
2 units = 7 × 2
= 14

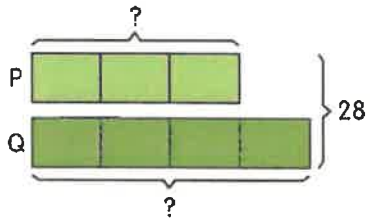
Quick Check

Find the values of P and Q.

20



21



Chapter 5

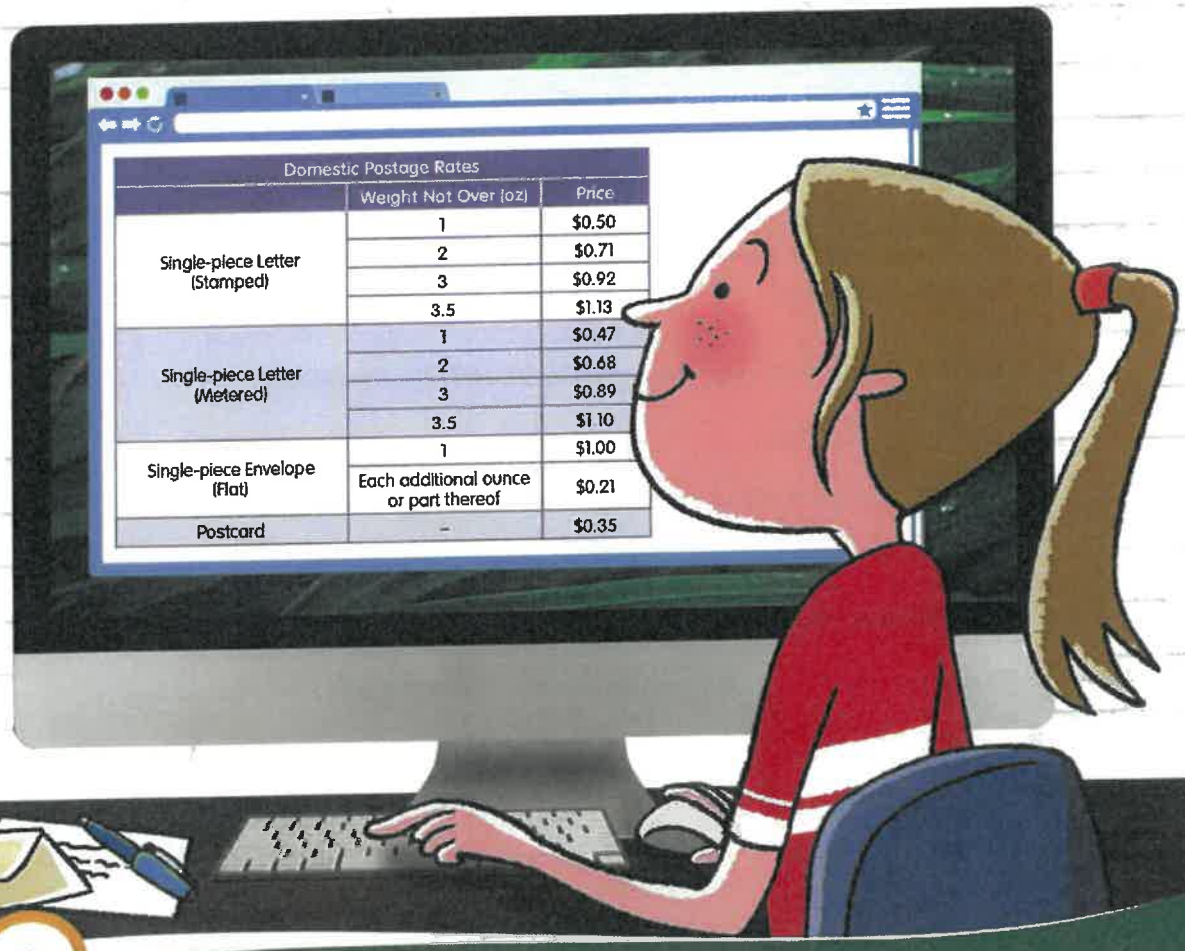
Rates and Speed

How much is the postage?

With the postal service, you can mail a letter or a parcel anywhere in the world. The cost of postal services depends on the type and weight of an item as well as its destination.

Look at the illustration below. Suppose you want to mail something to a friend. You visit the post office to weigh the envelope and it measures 4 ounces. The first ounce costs $1.00, and each additional ounce costs 21 cents. This additional per-ounce cost is an example of a rate.

In this chapter, you will learn more about rates and how to apply them to solve real-world problems. Some rates you may have seen before include unit prices for food and gas, currency exchange rates, and parking fees.



How does the use of a rate help you compare one quantity to another quantity?

RECALL PRIOR KNOWLEDGE

Name: _____ Date: _____

Multiplying whole numbers

Find 324 × 72.

$$\begin{array}{r} 324 \\ \times\ \ 72 \\ \hline 648 \\ 22{,}680 \\ \hline 23{,}328 \end{array}$$

324 × 2 = 648

324 × 70 = 22,680

Quick Check

Multiply.

1. 54 × 471
2. 75 × 698

Multiplying fractions or mixed numbers by a whole number

a $\frac{2}{15} \times 3 = \frac{2}{\cancel{15}_{5}} \times \cancel{3}^{1}$ Divide the denominator of the fraction and the whole number by their common factor, 3.

$= \frac{2}{5}$ Multiply.

b $2\frac{3}{5} \times 4 = \frac{13}{5} \times 4$ Express the mixed number as an improper fraction.

$= \frac{52}{5}$ Multiply.

$= 10\frac{2}{5}$ Express the improper fraction as a mixed number.

Quick Check

Find each product in simplest form.

3. $4 \times \frac{5}{32}$
4. $9\frac{1}{2} \times 8$

RECALL PRIOR KNOWLEDGE

Multiplying fractions

$\frac{4}{9} \times \frac{3}{16} = \frac{{}^{1}\cancel{4}}{\cancel{9}_{3}} \times \frac{\cancel{3}^{1}}{\cancel{16}_{4}}$ Divide 3 and 9 by their common factor, 3.
Divide 4 and 16 by their common factor, 4.

$= \frac{1 \times 1}{3 \times 4}$ Multiply the numerators.
Multiply the denominators.

$= \frac{1}{12}$

Quick Check

Find each product in simplest form.

5 $\frac{2}{7} \times \frac{63}{84}$

6 $\frac{11}{18} \times \frac{3}{44}$

Dividing with fractions and whole numbers

$\frac{3}{4} \div 27 = \frac{{}^{1}\cancel{3}}{4} \times \frac{1}{\cancel{27}_{9}}$ Write as a multiplication expression.
Divide the numerator and denominator by their common factor, 3.

$= \frac{1 \times 1}{4 \times 9}$ Multiply the numerators.
Multiply the denominators.

$= \frac{1}{36}$

Quick Check

Find each quotient in simplest form.

7 $\frac{6}{7} \div 30$

8 $72 \div \frac{9}{10}$

9 $\frac{7}{9} \div 49$

10 $56 \div \frac{8}{11}$

RECALL PRIOR KNOWLEDGE

Dividing fractions

$\frac{5}{8} \div \frac{35}{72} = \frac{1\cancel{5}}{\cancel{8}_1} \times \frac{\cancel{72}^9}{\cancel{35}_7}$ Write as a multiplication expression.
Divide the numerators and denominators by their common factors.

$= \frac{1 \times 9}{1 \times 7}$ Multiply the numerators.
Multiply the denominators.

$= \frac{9}{7}$ Express the improper fraction as a mixed number.

$= 1\frac{2}{7}$

Quick Check

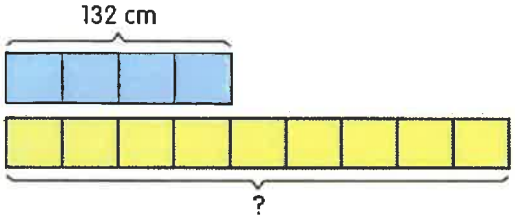
Find each quotient in simplest form.

11 $\frac{4}{9} \div \frac{36}{135}$

12 $\frac{77}{92} \div \frac{11}{42}$

Finding the quantity represented by a number of units

If 4 units represent 132 centimeters, find the value of 9 units.



4 units = 132
1 unit = 132 ÷ 4
= 33
9 units = 33 × 9
= 297

The value of 9 units is 297 centimeters.

Quick Check

Find the value of each number of units.

13 If 7 units represent 98 liters, find the value of 15 units.

14 If 13 units represent 143 square meters, find the value of 24 units.

RECALL PRIOR KNOWLEDGE

Finding ratios

You can use a ratio to compare two quantities that can be expressed as the same unit.

Find the ratio of length 47 centimeters to 2 meters.

47 cm : 2 m = 47 cm : 200 cm Express as the same unit.
= 47 : 200 Simplify.

This ratio can be expressed in three ways:
47 : 200, 47 to 200, and $\frac{47}{200}$.

Quick Check

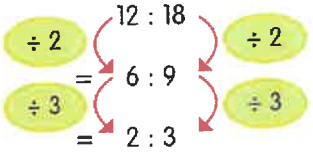
State whether each of the following can be expressed as a ratio.

15 3 m and 2 km

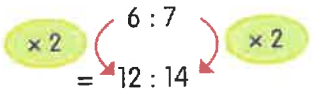
16 4 ft and 4 kg

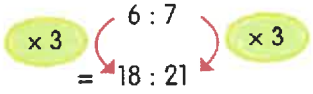
Finding ratios in simplest form

a When you divide or multiply the terms of a ratio by the same number, you obtain equivalent ratios.



12 : 18, 6 : 9, and 2 : 3 are equivalent ratios.
2 : 3 is in simplest form.





6 : 7, 12 : 14, and 18 : 21 are equivalent ratios.
6 : 7 is in simplest form.

RECALL PRIOR KNOWLEDGE

b You can write a ratio in simplest form by dividing the terms by their greatest common factor.

10 g : 3 kg = 10 g : 3,000 g — Think: 1 kg = 1,000 g, so 3 kg = 3,000 g.
= 10 : 3,000 — Write ratio without units.
= 10 ÷ 10 : 3,000 ÷ 10 — Divide by their greatest common factor, 10.
= 1 : 300

Quick Check

Use division to find all whole-number ratios equivalent to each of the following.

17 24 : 54

18 130 : 50

Express each ratio in simplest form.

19 90 : 60

20 72 : 184

21 4 km : 370 m

22 66 L : 120 mL

23 15 in. : 5 ft

24 270 qt : 105 gal

Chapter 6

Percent

How much is a percent?

Whenever a book is sold, an author receives a percent of the price of each book. The payment is called a royalty. A cartoonist can also earn royalties based on comic books sales. One common practice to find the royalties amount is to calculate a percent of the earnings from the sales of the books. For example, a cartoonist may be paid 5% royalty on the earnings from the sales of his books.

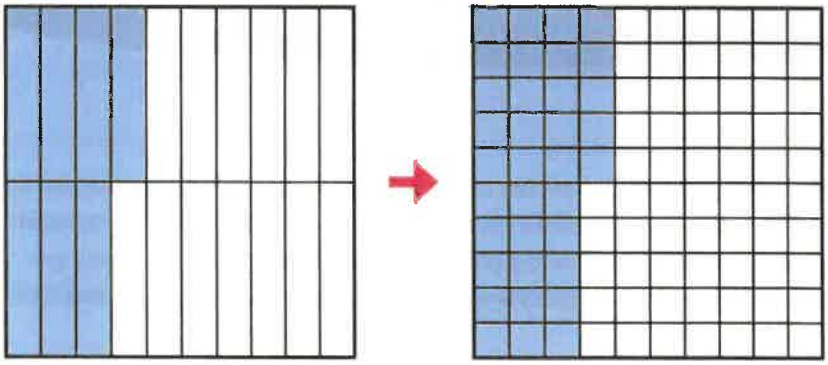
In this chapter, you will learn how to calculate percents. The skill you learn will be useful for solving a variety of real-world problems. Two examples include finding the interests on deposits and sales tax.

How does the use of a percent help you compare quantities?

RECALL PRIOR KNOWLEDGE

Name: _____ Date: _____

Finding equivalent fractions using multiplication



$$\frac{7}{20} \xrightarrow{\times 5} \frac{35}{100}$$

Multiplying the numerator and denominator of the fraction by the same number, 5, is the same as multiplying the fraction by $\frac{5}{5}$, or the number 1. It does not change the value of the fraction.

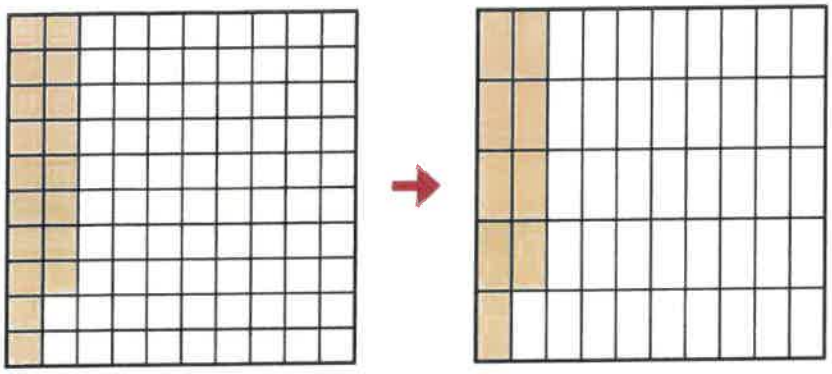
Quick Check

Find each missing numerator and denominator.

1. $\frac{4}{5} = \frac{8}{\square} = \frac{\square}{100}$

2. $\frac{9}{25} = \frac{18}{\square} = \frac{\square}{100}$

Finding equivalent fractions using division



$$\frac{18}{100} \xrightarrow{\div 2} \frac{9}{50} \xrightarrow{\div 2} \frac{18}{100}$$

$$\frac{18}{100} = \frac{9}{50}$$

Dividing both the numerator and denominator of the fraction by the same number, 2, is the same as dividing the fraction by $\frac{2}{2}$, or 1. It does not change the value of the fraction.

A fraction is in simplest form when the numerator and denominator have no common factor, except 1.

Quick Check

Express each fraction in simplest form.

3 $\frac{26}{100}$

4 $\frac{85}{100}$

5 $\frac{48}{100}$

6 $\frac{180}{240}$

RECALL PRIOR KNOWLEDGE

Writing fractions with a denominator of 100 as a decimal

a $\frac{35}{100} = 0.35$

b $\frac{7}{25} = \frac{28}{100}$
$= 0.28$

c $\frac{25}{500} = \frac{5}{100}$
$= 0.05$

Quick Check

Express each fraction as a decimal.

7 $\frac{15}{100}$

8 $\frac{2}{5}$

9 $\frac{39}{300}$

10 $\frac{25}{125}$

Multiplying fractions by a whole number

a $\frac{5}{6} \times 24 = \frac{5}{\cancel{6}_{1}} \times \cancel{24}^{4}$ Divide the denominator of the fraction and the whole number by their common factor, 6.

$= 20$ Multiply.

b $\frac{3}{8} \times 12 = \frac{3}{\cancel{8}_{2}} \times \cancel{12}^{3}$ Divide the denominator of the fraction and the whole number by their common factor, 4.

$= \frac{9}{2}$ Multiply.

$= 4\frac{1}{2}$ Express the improper fraction as a mixed number.

Quick Check

Find each product in simplest form.

11 $\frac{3}{7} \times 42$

12 $\frac{6}{25} \times 40$

SEACREST
COUNTRY DAY SCHOOL

July 2025

There are 7 chapter reviews to complete in July. Suggested pacing is below:

June 30-July 4:	Chapter 7
July 7-11:	Chapter 8
July 14-18:	Chapter 9-10
July 21-25:	Chapter 11-12
July 28-31:	Chapter 13

Chapter

7 Algebraic Expressions

How much do you know about designing a backyard?

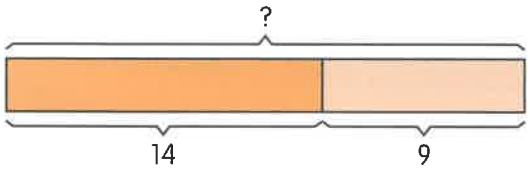
Algebraic expressions are found in practically all formulas. A landscape gardener can use formulas to find out the amount of materials required for a backyard or the cost of a project. Suppose the landscape gardener wants to build a rectangular flower bed. He has to calculate the amount of soil needed for the flower bed. He can use the formula Volume = length × width × height or simply $V = lwh$.

In this chapter, you will learn how to form algebraic expressions. The skill will allow you to solve problems simply.

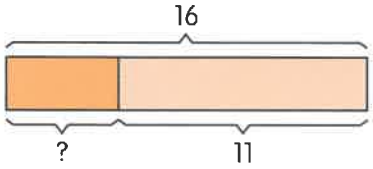
How can you use algebraic expressions?

Name: _____ Date: _____

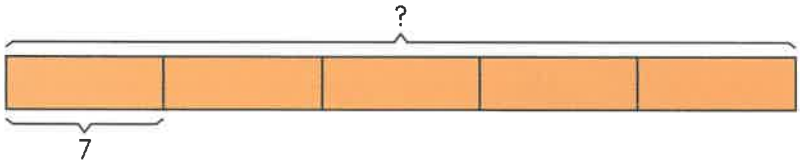
Using bar models to show the four operations



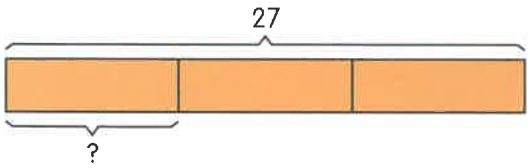
? = 14 + 9
= 23



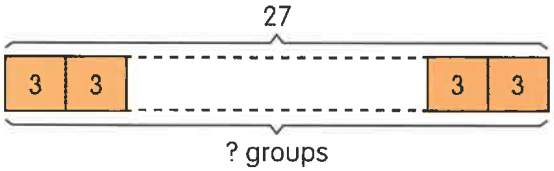
? = 16 – 11
= 5



? = 5 • 7
= 35



? = 27 ÷ 3
= 9



? = 27 ÷ 3
= 9

Quick Check

Draw a bar model to show each operation.

1. 15 + 4

2. 17 − 9

3. 6 · 5

4. 28 ÷ 4

Finding common factors and greatest common factor of two whole numbers

List the common factors of 6 and 14.
Then, find their greatest common factor.

$6 = 1 \cdot 6$
$6 = 2 \cdot 3$

$14 = 1 \cdot 14$
$14 = 2 \cdot 7$

Factors of 6: (1), (2), 3, and 6

Factors of 14: (1), (2), 7, and 14

The common factors of 6 and 14 are 1 and 2.
The greatest common factor of 6 and 14 is 2.

RECALL PRIOR KNOWLEDGE

Quick Check

Find the common factors and greatest common factor of each pair of numbers.

5 6 and 9

6 4 and 12

7 5 and 15

8 8 and 28

Meaning of mathematical terms

The sum of 3 and 4 is 3 + 4.

The difference "3 less than 4" is 4 – 3.

The product of 3 and 4 is 3 · 4.

The quotient "divide 3 by 4" is $3 \div 4$ or $\frac{3}{4}$.
3 is the dividend and 4 is the divisor.

Quick Check

Fill in each blank with quotient, sum, difference, product, dividend, or divisor.

9 The _____ "5 less than 7" is 7 – 5.

10 The _____ "divide 5 by 7" is $\frac{5}{7}$.

7 is the _____ and 5 is the _____.

11 The _____ of 5 and 7 is 7 · 5.

12 The _____ of 5 and 7 is 5 + 7.

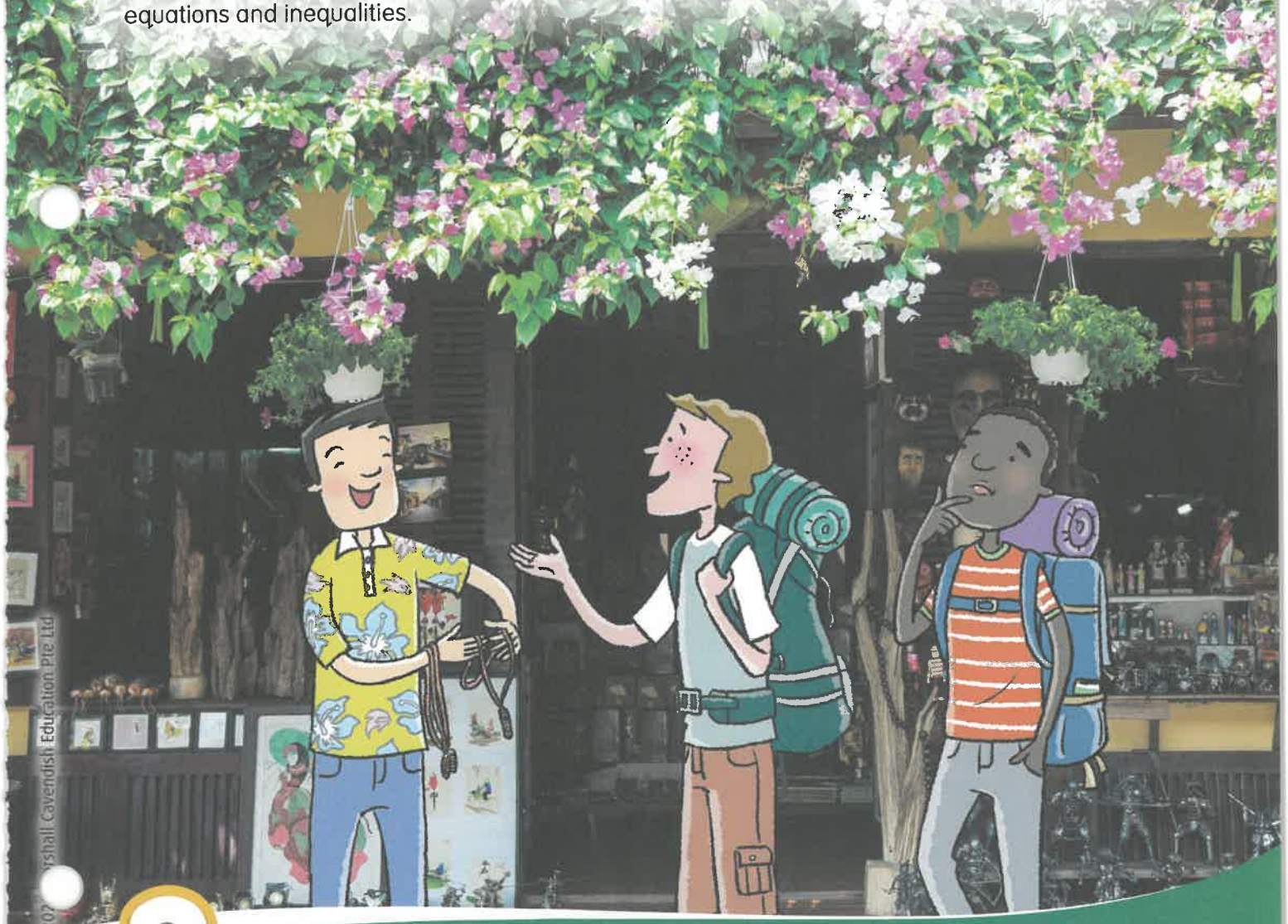
Chapter 8

Equations and Inequalities

Going on a vacation?

If you travel to another country, you can use linear equations and inequalities to help you plan your finances. Before you leave, you might want to change your U.S. dollars into a different currency. The amount of money you get in the new currency depends on how many U.S. dollars you start with. It also depends on the currency exchange rate. To find the amount of money you get in the new currency, you can use a linear equation.

While on your trip, you may want to set aside money to spend on souvenirs. You can use a linear inequality to find how many souvenirs you can buy. Planning can be made easier by using linear equations and inequalities.



How can you use equations and inequalities to describe situations and solve real-world problems?

RECALL PRIOR KNOWLEDGE

Name: _____ Date: _____

Finding the missing number in an equation

Find each missing number.

a $\boxed{?} + 7 = 13$

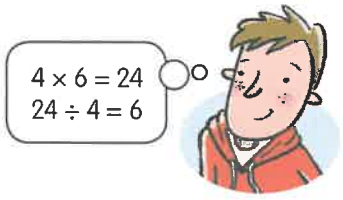
$\boxed{?} = 6$

b $18 - \boxed{?} = 6$

$\boxed{?} = 12$

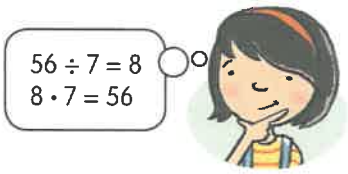
c $4 \cdot \boxed{?} = 24$

$\boxed{?} = 6$



d $\boxed{?} \div 7 = 8$

$\boxed{?} = 56$



Quick Check

Find each missing number.

1. $14 + \_\_\_\_ = 19$

2. $\_\_\_\_ - 8 = 9$

3. $\_\_\_\_ \cdot 7 = 21$

4. $54 \div \_\_\_\_ = 6$

Comparing numbers with symbols

Symbol	Meaning	Example
=	is equal to	$12 \times 4 = 48 \rightarrow 12 \times 4$ is equal to 48.
≠	is not equal to	$6 - 2 \neq 2 - 6 \rightarrow 6 - 2$ is not equal to $2 - 6$.
>	is greater than	$0 > -9 \rightarrow 0$ is greater than -9.
<	is less than	$-5 < -1 \rightarrow -5$ is less than -1.

Quick Check

Compare each pair of numbers or expressions using =, >, or <.

5. $25 \bigcirc -26$

6. $12 + 12 + 12 \bigcirc 3 \cdot 12$

7. $40 \div 8 \bigcirc 8 \div 40$

8. $-16 \bigcirc -7$

Using variables to write algebraic expressions

Statement	Expression
Sum of x and 7	$x + 7$
Subtract 14 from y	$y - 14$
Product of 8 and w	$8w$
Divide z by 6	$\frac{z}{6}$

Quick Check

Write an algebraic expression for each statement.

9 Sum of 15 and p

10 Subtract q from 10

11 Product of r and 23

12 Divide s by 11

Evaluating algebraic expressions

Evaluate $4y + 1$ when

a $y = 7$,

b $y = 10$

a When $y = 7$,

$4y + 1$

$= (4 \cdot 7) + 1$ Substitute.

$= 28 + 1$ Multiply within the parentheses.

$= 29$ Add.

b When $y = 10$,

$4y + 1$

$= (4 \cdot 10) + 1$ Substitute.

$= 40 + 1$ Multiply within the parentheses.

$= 41$ Add.

Quick Check

Evaluate each expression for the given values of the variable.

13 $3x + 5$ when $x = 9$ and $x = 12$

14 $28 - 4y$ when $y = 4$ and $y = 7$

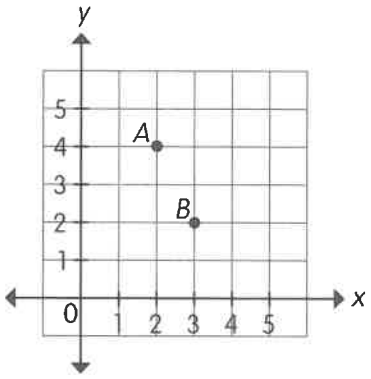
RECALL PRIOR KNOWLEDGE

Plotting points on a coordinate plane

Plot points $A(2, 4)$ and $B(3, 2)$ on a coordinate plane.

To locate point $A(2, 4)$, move 2 units to the right of the y-axis and 4 units above the x-axis. Then, mark the point with a dot.

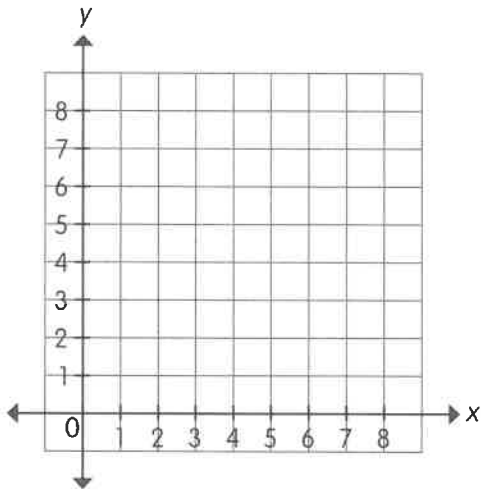
To locate point $B(3, 2)$, move 3 units to the right of the y-axis and 2 units above the x-axis. Then, mark the point with a dot.



Quick Check

Plot the points on the coordinate plane.

15 $K(2, 1)$, $L(3, 3)$, $M(0, 6)$, and $N(7, 5)$



Chapter 9

The Coordinate Plane

Have you ever used the maps on your smartphone?

Maps are useful for locating a street in an unfamiliar area. The maps on your smartphone use the Global Positioning System (GPS) coordinates to identify a precise location. The coordinates are usually expressed as the combination of latitude and longitude. Latitude is a measure of the distance north or south of the equator, in degrees. Longitude is a measure of the distance east or west of the equator, in degrees.

When using the maps, you can key in the street name to locate its position. You can also key in the GPS coordinates to locate a specific location along the street.

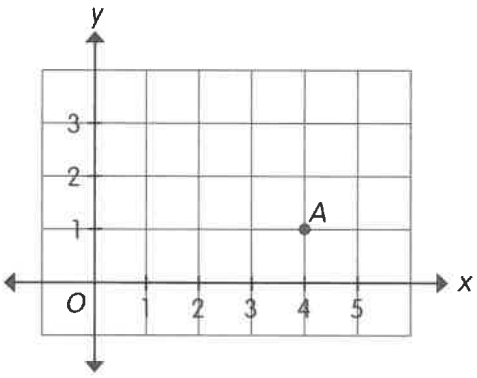
In this chapter, you will use coordinates to locate points on a coordinate plane.

How do you identify the location of a place on a given map?

RECALL PRIOR KNOWLEDGE

Name: _____ Date: _____

Identifying and plotting coordinates



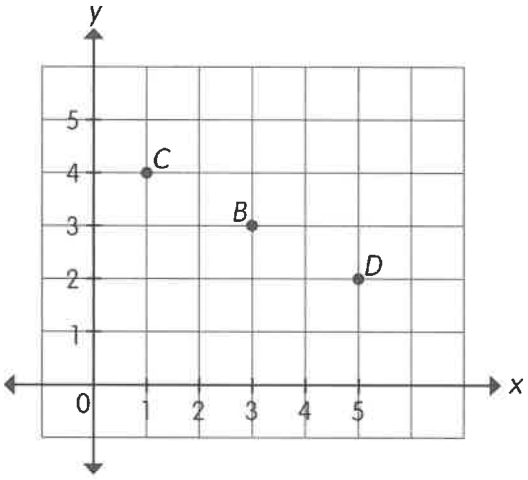
The coordinates of *O*, the origin, are (0, 0).

To find the location of Point *A*, move **4** units to the right on the *x*-axis, and **1** unit up on the *y*-axis.

The coordinates of *A* are (**4**, **1**).

Quick Check

Use the coordinate plane below.



1. Give the coordinates of Points *B*, *C*, and *D*.

Use graph paper. Plot the points on a coordinate plane.

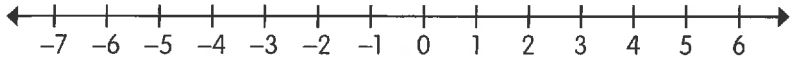
2. *P* (3, 2), *Q* (2, 3), and *R* (0, 4)

Representing negative numbers on a number line

Negative numbers are numbers less than zero.

-2, -10, -23, and -134 are examples of negative numbers.

Negative numbers are found to the left of zero on the number line.



Quick Check

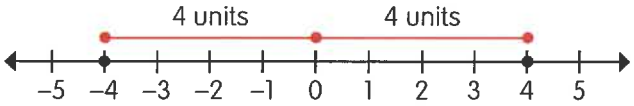
Draw a horizontal number line to represent each set of numbers.

3 $-8, -6, -3, 0, 2$

4 $-15, -11, -9, -7, -2$

Recognizing and writing the absolute value of a number

The absolute value of a number is the distance from itself to 0 on the number line.
It is always positive or zero.



-4 is 4 units away from 0. Its absolute value is 4.
Similarly, the absolute value of 4 is also 4.
You can write $|-4| = 4$, and $|4| = 4$.

Quick Check

Write the absolute value of each number.

5 11

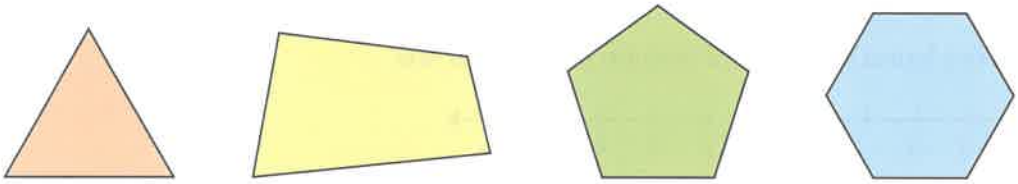
6 -16

7 -21

RECALL PRIOR KNOWLEDGE

Identifying special polygons

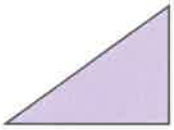
Polygons are closed plane figures formed by three or more line segments.
Here are some polygons.



triangle quadrilateral pentagon hexagon

Quick Check

Identify and write the name of each figure.

8 

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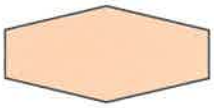
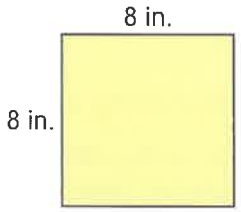
10 

Finding the perimeter of a figure by adding up all its sides

The perimeter of a figure is the distance around it.

The figure shows a square. Each side of the square is 8 inches long.

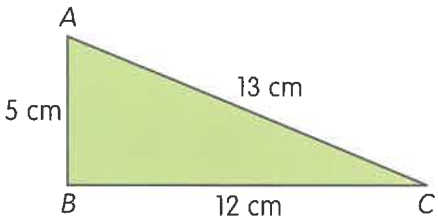


Perimeter of the square = 8 + 8 + 8 + 8
= 32 in.

Quick Check

Find the perimeter of each figure.

11 Figure *ABC* is a right triangle.



12 Figure *DEFG* is a rectangle.

Chapter 10

Area of Polygons

Have you ever made a mosaic?

A mosaic is a piece of art made by assembling small pieces of colored glass, stone, or other materials. Mosaic art has been around since ancient times and was widely used for decoration.

To create a mosaic, you will need an adhesive surface to hold the mosaic pieces. Preliminary design may be drawn on the surface before fitting the mosaic pieces together. To decide how many mosaic pieces are needed, an artist needs to know the size and shape of each piece. In this chapter, you will learn to find areas of various geometric shapes.

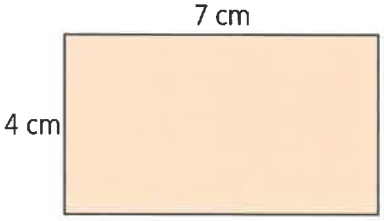
How can you find the areas of various geometric shapes?

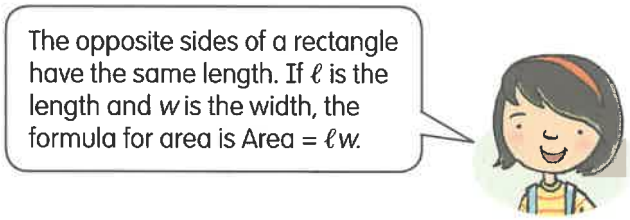
RECALL PRIOR KNOWLEDGE

Name: _____ Date: _____

Finding the area of a rectangle using a formula

The longer side of a rectangle is called the length. The shorter side is called the width.



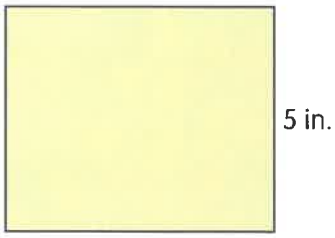


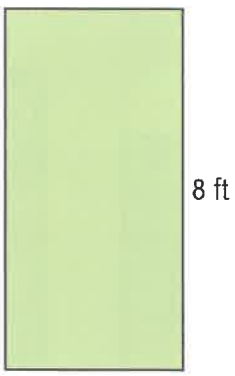
Area of rectangle $= \ell w$
$= 7 \cdot 4$
$= 28 \text{ cm}^2$

The area of the rectangle is 28 square centimeters.

Quick Check

Find the area of each rectangle.

1. 

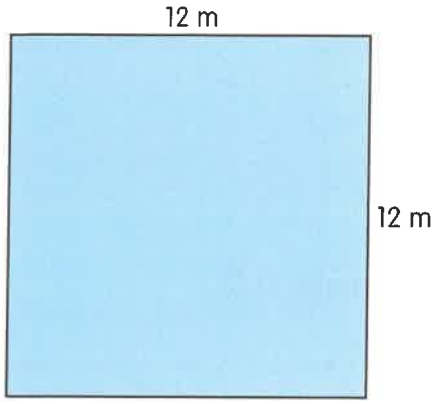
2. 

Solve.

3. The length of a rectangle is 15 meters and its width is 9 meters. Find the area of the rectangle.

Finding the area of a square using a formula

A side length of a square is 12 meters. Find the area of the square.

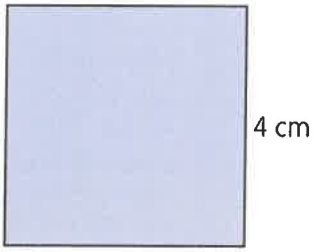


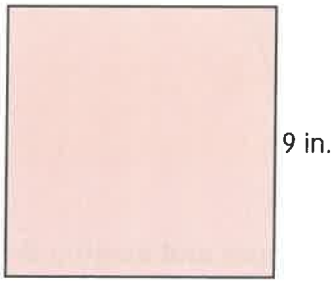
Area of square = ℓ^2
= 12^2
= 144 m^2

The area of the square is 144 square meters.

Quick Check

Find the area of each square.

4 

5 

Solve.

6 A side length of a square is 10 feet. Find the area of the square.

RECALL PRIOR KNOWLEDGE

Identifying parallelograms, trapezoids, and rhombuses

Figure $ABCD$ is a parallelogram. There are two pairs of parallel sides. $\overline{AB}$ is parallel to $\overline{DC}$. $\overline{AD}$ is parallel to $\overline{BC}$.

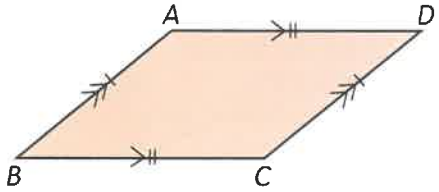


Figure $PQRS$ is a trapezoid. There is one pair of parallel sides. $\overline{PS}$ is parallel to $\overline{QR}$.

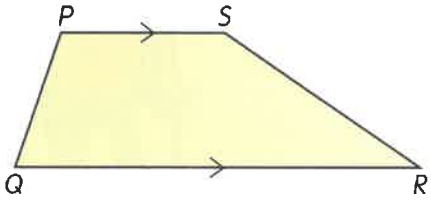
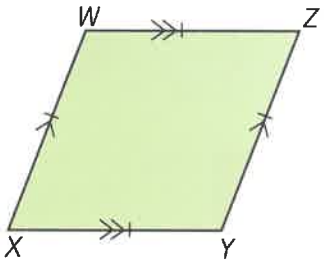


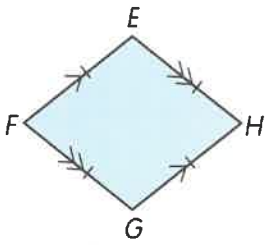
Figure $WXYZ$ is a rhombus. The side lengths of a rhombus are equal, and the opposite sides are parallel. $\overline{WX}$ is parallel to $\overline{ZY}$. $\overline{XY}$ is parallel to $\overline{WZ}$.



Quick Check

Name each figure and identify the pairs of parallel lines.

7



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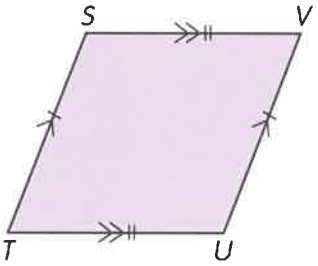

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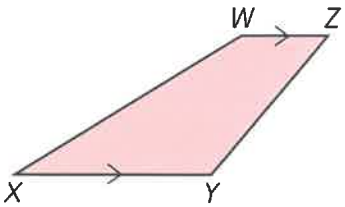


Chapter 11

Surface Area and Volume of Solids

How can math help you make candles?

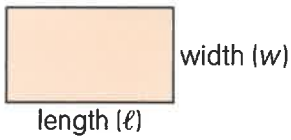
To make a candle, you need some wax, a mold, and a wick. First, melt the wax and pour it into the mold. Then, insert the wick. When the wax has cooled and hardened, wrap the candle in plastic. How much wax do you need? To find out, calculate the volume of the mold. How much plastic wrap do you need? To find out, calculate the surface area of the candle. In this chapter, you will learn to calculate the volumes of rectangular prisms, and the surface areas of prisms and pyramids.

How can you make use of surface area and volume of prisms to solve real-world problems?

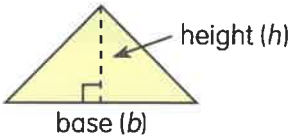
RECALL PRIOR KNOWLEDGE

Name: _____ Date: _____

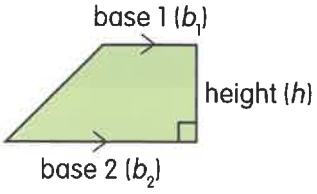
Finding the area of a rectangle, a triangle, and a trapezoid



Area of rectangle
= length · width
$A = \ell \cdot w$ or ℓw



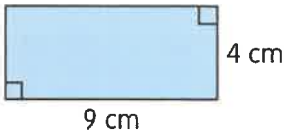
Area of triangle
$= \frac{1}{2} \cdot$ base · height
$A = \frac{1}{2} \cdot b \cdot h$ or $\frac{1}{2}bh$

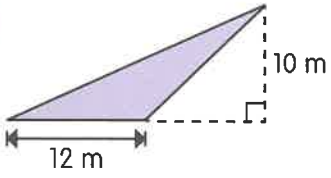


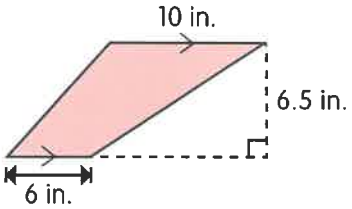
Area of trapezoid
$= \frac{1}{2} \cdot$ height · sum of parallel sides
$A = \frac{1}{2} \cdot h \cdot (b_1 + b_2)$ or $\frac{1}{2}h(b_1 + b_2)$

Quick Check

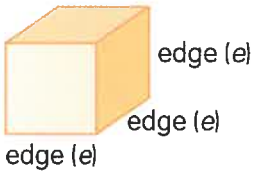
Find the area of each figure.

1. 

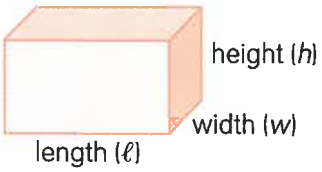
2. 

3. 

Finding the volumes of rectangular prisms



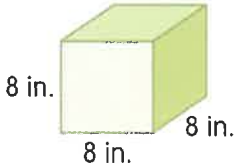
Volume of cube
= edge · edge · edge
$V = e \cdot e \cdot e$ or e^3

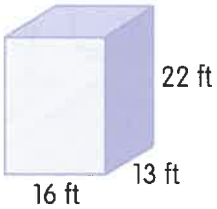


Volume of rectangular prism
= length · width · height
$V = \ell \cdot w \cdot h$ or ℓwh

Quick Check

Find the volume of each solid.

4. 

5. 

Chapter 12

Introduction to Statistics

Do you know why and how statistics are collected?

Have you ever wondered how a school's cafeteria manager plans for the meals each day? Some questions that might be asked to help the kitchen with food preparation include:

- How many students do we serve each day?
- How many students order pancakes for breakfast?

These are statistical questions because many pieces of data are needed to answer them. Cafeteria managers need answers to these questions to find out how much food they need to buy each week, or how many cooks they need to hire. Once these data are collected, you need to organize them to see certain trends. Data displays, such as graphs, summarize the data. This makes it easier to understand the data. Learning about statistics and data displays can help you find solutions to real-world problems. In this chapter, you will learn to summarize data and represent them in various ways.

How can you represent numerical data and use them to answer statistical questions?

RECALL PRIOR KNOWLEDGE

Name: _____ Date: _____

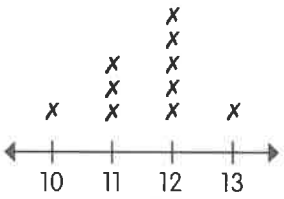
Interpreting Data in a Line Plot

Ms. Scott surveyed a group of children in a music class to find out about their ages. The table shows the results of her survey.

Ages of Children

Age (yr)	10	11	12	13
Number of Children	1	3	5	1

Ms. Scott made a line plot to show the results of her survey. Each ✗ represents 1 child.



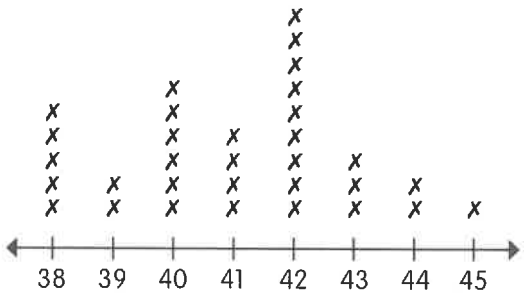
Ages of Children (yr)

Three of the children are 11 years old.
The most common age is 12 years old.
The number of children who are 10 years old and 13 years old are the same.
The total number of children in the music class is 10.
Six of the children are older than 11 years old.

Quick Check

Answer each question.

The line plot shows the weight, in pounds, of cartons of apples in a grocery store. Each ✗ represents one carton of apples.



Weight of Cartons of Apples (lb)

1. What is the difference in weight between the heaviest and the lightest carton of apples?

2. How many cartons weigh more than 41 pounds?

3. How many cartons are there in all?

4. What percent of the total number of cartons weigh 41 pounds?

Chapter 13

Measures of Central Tendency and Variability

How do shoemakers know what customers will buy?

The quantity of shoes manufactured for each size depends on what retailers have ordered. Production can be tailored to meet the demand. This can be done by finding a value around which most orders cluster. It helps to reduce waste in the manufacturing process.

In statistics, measures of central tendency and spread are used to summarize large amounts of data. Learning how to summarize data is an important part of any business. In this chapter, you will learn to summarize and make meaningful interpretation of data.

How can you summarize and interpret data to solve real-world problems?

RECALL PRIOR KNOWLEDGE

Name: _____ Date: _____

Dividing decimals by a whole number

Find the value of 29.1 ÷ 6.

$$\begin{array}{r} 4.85 \\ 6\overline{)29.1} \\ 24 \\ \hline 51 \\ 48 \\ \hline 30 \\ 30 \\ \hline 0 \end{array}$$

29 ones ÷ 6 = 4 ones R 5 ones

Regroup the remainder 5 ones.
5 ones = 50 tenths
Add the tenths.
50 tenths + 1 tenth = 51 tenths
51 tenths ÷ 6 = 8 tenths R 3 tenths

Regroup the remainder 3 tenths.
3 tenths = 30 hundredths
30 hundredths ÷ 6 = 5 hundredths

The value of 29.1 ÷ 6 is 4.85.

Quick Check

Divide.

1. 10.2 ÷ 3

2. 16.5 ÷ 2

3. 48.09 ÷ 7

4. 57.24 ÷ 8

Writing the absolute value of a number

The absolute value of a number is the distance of that number from 0 on a number line. Since distances are always positive, the absolute value of a positive or negative number is always positive. Absolute values cannot be negative.

The absolute values of 5 and −5 are both 5.
$|5| = 5$
$|-5| = 5$

Quick Check

Use the following set of numbers to answer 5 to 8.

20	−10	−20	13	−25

5 Find the absolute value of each number.

6 Which number is nearest to 0?

7 Which number is farthest from 0?

8 Which two numbers have the same absolute value?

9 Which number has the least absolute value?

RECALL PRIOR KNOWLEDGE

Drawing frequency tables and dot plots

Frequency tables and dot plots are used to organize and summarize data.

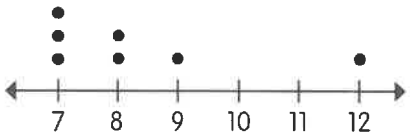
The data show the number of hours that 7 students spent on a school project.

7	7	12	9	8	8	7

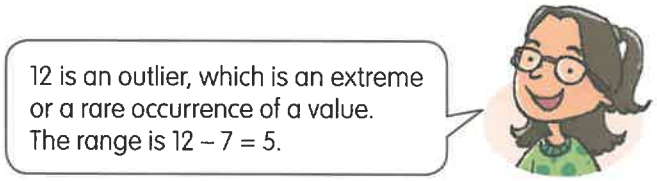
The data can be summarized in a frequency table and dot plot.

Time Spent on School Project

Time (h)	Frequency
7	3
8	2
9	1
10	0
11	0
12	1



Time Spent on Project (h)



Quick Check

Summarize the data in a frequency table. Then, draw a dot plot and find its range.

10 The data show the number of members in 12 families.

4	5	5	4	5	4
4	8	5	4	4	4