UNIT 2

STUDENT BOOK 1 LESSON

Exploring Large Numbers

Quick Review

At Home At School

➤ Here are some ways to represent the number 26 489 215.
Standard Form: 26 489 215
Words: twenty-six million four hundred eighty-nine thousand two hundred fifteen
Expanded Form:
20 000 000 + 6 000 000 + 400 000 + 80 000 + 9000 + 200 + 10 + 5
Number-Word Form: 26 million 489 thousand 215
Place-Value Chart:

Millions Period			Thousands Period			Units Period		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones
	2	6	4	8	9	2	1	5

➤ The place-value chart can be extended to the left to show greater whole numbers.

Trillions			Billions			Millions			Thousands			Units		
H	T	O	H	T	O	H	T	O	H	T	O	H	T	O

Try These

1. Write each number in standard form.

   a) 7 million 481 thousand 624 _____

   b) 3 000 000 000 + 200 000 000 + 600 000 + 20 000 + 9 _____

   c) four million six hundred sixty-two thousand eighty-two _____

2. Write the value of each underlined digit.

   a) 7<u>2</u> 348 675 125 _____ b) 494 <u>4</u>34 434 _____

Practice

1. Complete the chart.

Standard Form	Expanded Form	Number-Word Form
3 267 417		
	4 000 000 + 600 000 + 4000 + 90 + 2	
		625 million 227 thousand 282

2. Write each number in words.

   a) 62 430 021 _____

   _____

   b) 5 602 347 189 _____

   _____

   c) 25 482 617 _____

   _____

3. Find 2 large numbers in a newspaper or magazine.
   Write each number in as many ways as you can.

   a) _____

   _____

   b) _____

   _____

Stretch Your Thinking

Represent and describe the number 1 trillion in as many ways as you can.

_____

_____

UNIT 2

STUDENT BOOK 2 LESSON

Numbers All Around Us

Quick Review

At Home At School

➤ We add, subtract, multiply, or divide with numbers to solve problems. Addition, subtraction, multiplication, and division are *operations*.

When the numbers in a problem are large, we use a calculator.

➤ This table shows the numbers of people who attended football games in October. What is the total number of people who attended the games? Use a calculator.

Date	Number of People
Oct. 5	2542
Oct. 12	1967
Oct. 19	2038
Oct. 26	1872

To find how many people attended the games, add:

2542 + 1967 + 2038 + 1872 = 8419

There were 8419 people who attended the football games.

➤ Estimate to check if the answer is reasonable.
2500 + 2000 + 2000 + 1900 = 8400
8419 is close to 8400, so the answer is reasonable.

Try These

1. Suki is stacking 48-kg boxes in a freight elevator.
The elevator can hold a maximum of 456 kg.
How many boxes can Suki stack in the elevator?

_____

_____

2. A package of dental floss has 175 m of floss.
Dr. Pierre bought 150 packages to give to his patients.
How many metres of dental floss is that?

_____

_____

Practice

1. A daily newspaper has a circulation of 3 679 000 copies per day. If 1 day's papers are distributed evenly among 13 cities, how many copies would each city receive?

2. Manny's dog spent 4 days in a veterinary hospital.
Manny paid $1585 for the surgery, $16.25 a day for board, and $49.75 for medicine. What was Manny's total bill?

3. Flight 168 carries 54 passengers, each with 2 suitcases.
Each suitcase has a mass of about 16 kg.
The airplane was built to carry 2250 kg of luggage.
Is the flight over or under the limit? Explain.

4. Edgar's corn field is 896 m long and 742 m wide.
What is the area of Edgar's corn field?

Stretch Your Thinking

Write a 2-step problem that requires 2 different operations to solve.
Estimate to check if the answer is reasonable.

UNIT 2

STUDENT BOOK 3 LESSON

Exploring Multiples

Quick Review

At Home At School

To find the **multiples** of a number, start at that number and count on by the number.

The multiples of 5 are:
5, 10, 15, 20, 25, 30, 35, 40, ...

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

The multiples of 3 are:
3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, ...

15 and 30 appear in both lists.
They are **common multiples** of 5 and 3.

Each common multiple of 5 and 3 is divisible by 5 and by 3.

Try These

1. List the first 6 multiples of each number.

a) 4 _____ **b)** 9 _____

c) 25 _____ **d)** 6 _____

e) 12 _____ **f)** 100 _____

2. Use the hundred chart.
Colour the multiples of 7.
Circle the multiples of 3.
What are the common multiples of 7 and 3 on the chart?

_____

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

Practice

1. Write the first 10 multiples of each pair of numbers.
   Circle the common multiples of each pair.

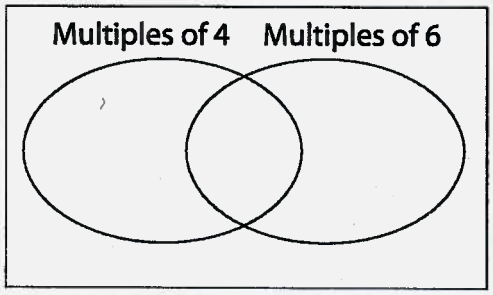
   a) 6: _____

   8: _____

   b) 4: _____

   7: _____

2. Sort these numbers in the Venn diagram.
   20, 33, 36, 88, 64, 48,
   68, 78, 84, 32, 76, 90,
   12, 54, 65, 42, 66, 102



3. Find all the common multiples of 8 and 12 that are less than 100.

   _____

4. Find the first 3 common multiples of each set of numbers.

   a) 2, 3, and 9 _____ **b)** 2, 3, and 5 _____

   c) 4, 5, and 10 _____ **d)** 6, 7, and 8 _____

5. Use a calculator. Find the first common multiple of each pair of numbers.

   a) 16 and 18 _____ **b)** 12 and 16 _____

   c) 12 and 15 _____ **d)** 11 and 12 _____

Stretch Your Thinking

Bethany wears jeans every 2 days. She wears running shoes every 3 days. If she wears jeans with running shoes on May 1, what are the next 3 dates on which she will wear both jeans and running shoes?

_____

UNIT 2

STUDENT BOOK 4 LESSON

Prime and Composite Numbers

Quick Review

At Home / At School

➤ You can make only 1 rectangle with 7 tiles.
7 has 2 factors: 1 and 7
7 is a **prime number**.
A prime number is a number greater than 1 that has exactly 2 factors: 1 and itself.

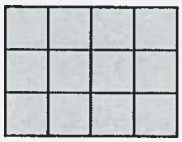
$1 \times 7 = 7$

➤ You can make 3 different rectangles with 12 tiles.

$1 \times 12 = 12$

12 has 6 factors: 1, 2, 3, 4, 6, and 12
The factors that are prime numbers are 2 and 3.
12 is a **composite number**.

$2 \times 6 = 12$



$3 \times 4 = 12$

A composite number is a number with more than 2 factors.
A composite number can be written as a product of prime factors:
$12 = 2 \times 2 \times 3$

Try These

1. List all the factors of each number.

a) 15 _____ **b)** 18 _____ **c)** 27 _____

d) 34 _____ **e)** 8 _____ **f)** 5 _____

2. Tell if each number in question 1 is prime or composite.

a) _____ **b)** _____ **c)** _____

d) _____ **e)** _____ **f)** _____

3. Write 2 numbers less than 50 that have exactly 3 factors.

_____

Practice

1. Play this game with a partner.
   You will need 6 number cubes, each labelled 1 to 6.
   - ➤ Each player's turn lasts until the total rolled on the number cubes is a prime number.
     The object of the game is to roll a prime number total using the least number of rolls.
   - ➤ On each roll, you may choose to use from 2 to 6 number cubes.
     The number of rolls needed to reach a prime number is your score for that round.
   - ➤ The player with the lower score at the end of 5 rounds wins.

2. Three numbers between 80 and 100 are prime numbers.

   What numbers are they? _____

3. Eight numbers between 31 and 41 are composite numbers.

   What numbers are they? _____

4. Use the table to sort the numbers from 30 to 50.

	Odd	Even
Prime		
Composite		

Stretch Your Thinking

Write the ages of 6 relatives.
Tell whether each age is a prime number or a composite number.

_____

_____

UNIT 2

STUDENT BOOK 5 LESSON

Investigating Factors

Quick Review

At Home At School

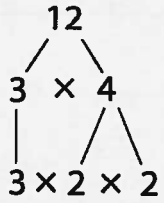
➤ When we find the same factors for 2 numbers, we find **common factors.**

The factors of 12 are: 1, 2, 3, 4, 6, 12
The factors of 16 are: 1, 2, 4, 8, 16

The common factors of 12 and 16 are 1, 2, and 4.

➤ Here are 2 ways to find the factors of 12 that are prime numbers.

• Draw a factor tree.



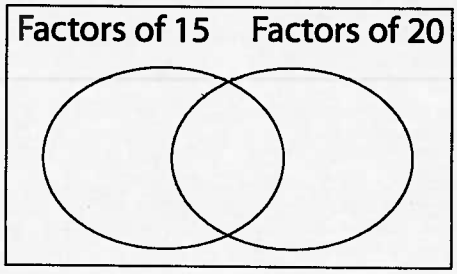
• Use repeated division by prime numbers.

$$2\overline{)12}\quad 6$$
$$2\overline{)6}\quad 3$$
$$3\overline{)3}\quad 1$$

The factors of 12 that are prime numbers are 2 and 3.

Try These

1. Use the Venn diagram to show the factors of 15 and 20.
What are the common factors? _____



2. Find all the factors of each number.

a) 36 _____

b) 45 _____

c) 60 _____

Practice

1. Find the common factors of each pair of numbers.

   a) 30, 50 _____

   _____

   _____

   b) 16, 42 _____

   _____

   _____

2. Find the factors of each number that are prime.

   a) 45 b) 32 c) 70

   Factors that are prime: Factor that is prime: Factors that are prime:

   ___ , ___ ___ ___, ___, ___

Stretch Your Thinking

Draw 3 different factor trees for 72.

UNIT 2

STUDENT BOOK 7 LESSON

Order of Operations

Quick Review

At Home At School

To make sure everyone gets the same answer when solving an expression, we use this order of operations:

- Do the operations in brackets.
- Multiply and divide, in order, from left to right.
- Then add and subtract, in order, from left to right.

➤ Solve: $12 + 20 \div 5$

$12 + 20 \div 5$

$= 12 + 4$

$= 16$

➤ Solve: $9 \times (6 - 4)$

$9 \times (6 - 4)$

$= 9 \times 2$

$= 18$

➤ Solve: $25 - 4 + 6$

$25 - 4 + 6$

$= 21 + 6$

$= 27$

Try These

1. Solve each expression.
Use the order of operations.

a) $15 + 7 \times 2 =$ ____ **b)** $34 - 6 \div 3 =$ ____ **c)** $35 + 15 \times 2 =$ ____

d) $30 \div (2 + 3) =$ ____ **e)** $44 \div 11 + 4 =$ ____ **f)** $(14 \div 7) \times 4 =$ ____

g) $24 + (16 \div 8) =$ ____ **h)** $(17 + 2) - 14 =$ ____ **i)** $3 \times 9 - 4 =$ ____

2. Use mental math to solve.

a) $2 \times 9 - 3 + 4 =$ ____ **b)** $5 + 150 \div 25 =$ ____

c) $30 + 30 \div 6 =$ ____ **d)** $(8 \times 9) - (8 \times 8) =$ ____

e) $24 \div 12 \times 9 =$ ____ **f)** $(200 + 400) \times 2 =$ ____

g) $18 \div 2 \times 2 =$ ____ **h)** $4 \times (3 \times 5) =$ ____

i) $12 + 6 - 2 =$ ____ **j)** $(50 + 100) \times 2 - 100 =$ ____

Practice

1. Solve each expression.

   a) $48 \div 12 \div 2 =$ ____ b) $8 \times (10 - 4) =$ ____ c) $28 - 12 \div 4 =$ ____

   d) $7 \times (3 + 2) =$ ____ e) $16 \div 2 \times 9 =$ ____ f) $15 \div (3 \times 5) =$ ____

2. Use brackets to make each number sentence true.

   a) $2 \times 3 + 6 = 18$ b) $20 \times 15 - 2 = 260$

   c) $5 + 4 \div 3 = 3$ d) $12 + 10 \div 11 = 2$

   e) $6 + 8 \div 2 = 10$ f) $5 \times 4 \div 2 = 10$

3. Write a number sentence to show the order of operations you use to solve each problem.

   a) Sandar bought 4 bags of chips at $2.99 each.
   She used a $2.00 coupon to pay part of the cost.
   How much did Sandar pay for the chips?

   _____

   b) The decorating committee needs 3 balloons for each of 15 tables.
   They also need 20 balloons for each of the 4 walls of the room.
   How many balloons does the committee need?

   _____

Stretch Your Thinking

You and 3 friends order a pizza, 4 large drinks, and a loaf of cheese bread.
You split the cost evenly with your friends.
What order of operations would you use to find out
how much each person should pay?

_____

_____

_____

UNIT 2

STUDENT BOOK 8 LESSON

What Is an Integer?

Quick Review

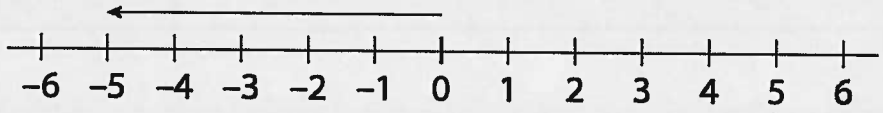
At Home At School

➤ Numbers such as +16 and −12 are **integers.**
+16 is a **positive integer.**
−12 is a **negative integer.**

We can use coloured tiles to represent integers.

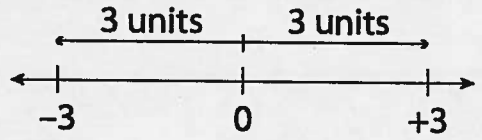
□ represents +1. □□□□ represents +4.
■ represents −1. ■■■■ represents −4.

➤ We can show integers on a number line.



The arrow on the number line represents −5.
−5 is a negative integer. We say, "Negative 5."

➤ +3 and −3 are **opposite integers.**
They are the same distance from 0 and are on opposite sides of 0.



Try These

1. Write the integers modelled by each set of tiles.

a) □□□□□□ **b)** ■■■ **c)** ■

_____ _____ _____

2. Write the opposite of each integer.

a) +7 _____ **b)** −23 _____ **c)** −9 _____

d) −16 _____ **e)** +38 _____ **f)** 24 _____

Practice

1. Write an integer to represent each situation.

   a) Sal withdrew $45 from his savings account. _____

   b) Ethanol freezes at minus 114°C. _____

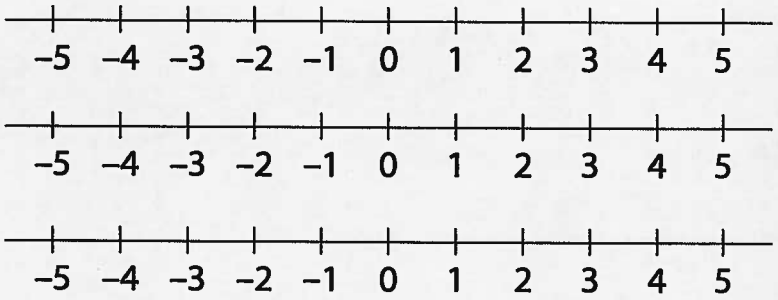
   c) Justina earned $35 babysitting. _____

2. Write the opposite of each integer.
   Mark each pair of integers on the number line.

   a) +4 _____

   b) −2 _____

   c) +1 _____



3. Explain.

   a) If +9 represents 9 steps forward, what does −9 represent?

   _____

   b) If −5 represents 5 dollars spent, what does +5 represent?

   _____

   c) If +14 represents 14 floors up, what does −6 represent?

   _____

Stretch Your Thinking

Find examples of unusual temperatures, such as boiling and freezing points of various liquids, on other planets. Record your findings.

_____

_____

_____

UNIT 2

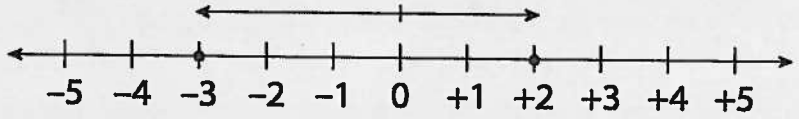
STUDENT BOOK 9 LESSON

Comparing and Ordering Integers

Quick Review

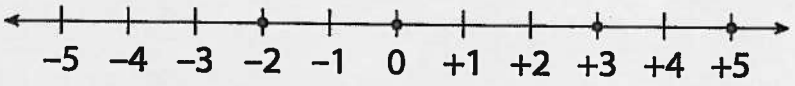
At Home At School

➤ We can use a number line to compare and order integers.
Compare +2 and −3.



+2 is to the right of −3 on a number line.
+2 is greater than −3, so we write: +2 > −3
−3 is less than +2, so we write: −3 < +2

➤ To order the integers +3, −2, 0, and +5, draw a number line from −5 to +5.
Mark each integer on the number line.



The integers increase from left to right.
So, the integers from least to greatest are: −2, 0, +3, +5
The integers from greatest to least are: +5, +3, 0, −2

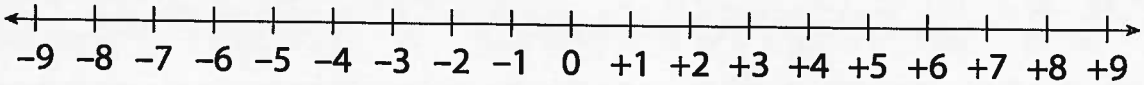
Try These

1. Fill in the missing integers.

2. Use > or < between the integers.
Use the number line to help you.

a) +9 _____ 0 **b)** +7 _____ +2 **c)** −2 _____ +8

d) −8 _____ −1 **e)** +4 _____ +8 **f)** +3 _____ −6



Practice

1. Circle the least integer in each set.

   a) +12, +3, +8 b) 0, +5, −7 c) −8, +8, −9, +9

   d) +6, −4, −2, 0 e) −10, −3, +3, 0 f) −5, +10, −20, +40

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

   a) 0, +8, −8 _____ b) −5, +2, −9 _____

   c) −20, +1, −1 _____ d) −27, −33, +30, −24 _____

3. Order the integers in each set from greatest to least.

   a) +2, +4, −3 _____ b) −3, +1, −4 _____

   c) +2, +7, −18 _____ d) 0, +20, −50, −60 _____

4. a) Which of these integers are greater than −7?

   −2, +1, −9, −4 _____

   b) Which of these integers are less than −8?

   −4, −11, −14, +2 _____

5. a) Name 3 integers greater than −11.

   _____

   b) Name 3 integers less than −4.

   _____

Stretch Your Thinking

Use a number line. Find the integer that is:

a) halfway between −6 and +6 _____ b) 3 more than −4 _____

c) halfway between −5 and +1 _____ d) 1 less than +3 _____