About Pearson mathology

Practice Workbook 7

What Is the Purpose of the Workbook?

For students

The Workbook supports students in their learning journey with independent or small-group practice opportunities for

- building on their understanding through a variety of questions, tasks, games, and challenges connecting foundational concepts;
- organizing and representing their thinking and understanding; and
- connecting math concepts to their lived experiences.

For teachers

The Workbook helps you support students by

- offering intentional independent and small-group practice ideas, aligned with your curriculum;
- providing additional assessment opportunities and ways to support learning; and
- allowing parents and caregivers an opportunity to see what their child is learning.

Go to Mathology.ca for comprehensive lesson notes supporting a deep understanding of student thinking and assessment opportunities that help determine the best next steps for your learners.

How To Use the Workbook

After working through lessons with students

- Identify the practice units that correlate with the lessons you've taught.
- Use the Workbook flexibly, as in-class practice (small-group, collaborative, or independent work).
- Discuss the practice tasks and ensure clarity.
- Identify the open-ended tasks and discuss ways for students to represent their understanding.
- Debrief the tasks and ask students to share their strategies.
- Observe students' level of understanding and build on it through additional tasks.

Reaching All Learners (Differentiated Instruction)

Consider the variety of learners in your classroom and how the Workbook can best support them. Key questions to reflect on include:

- Are there certain questions that I want all students to complete?
- Do some students need accommodations?
- Which students might benefit from small-group conversations before starting tasks?
- How can I encourage the use of manipulatives and models (e.g., Math Mats, Base Ten Blocks)?
- How can students use the Workbook to recognize their strengths and build a math identity (e.g., self-reflection)?

Curriculum Support

Go to www.pearson.com/ca/en/k-12-education/mathology.html for a detailed alignment of this resource with your curriculum.

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Contents

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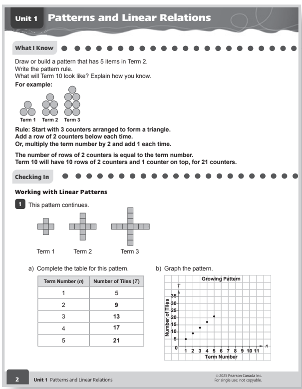
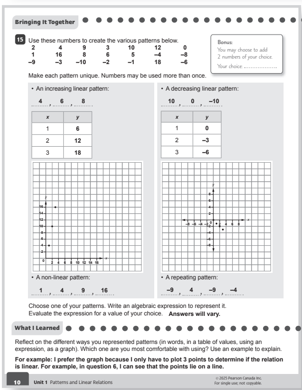
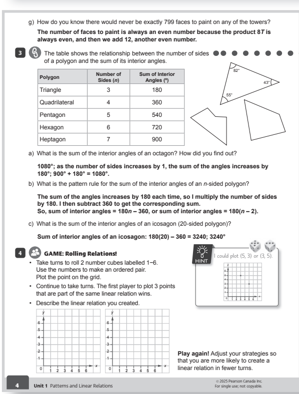
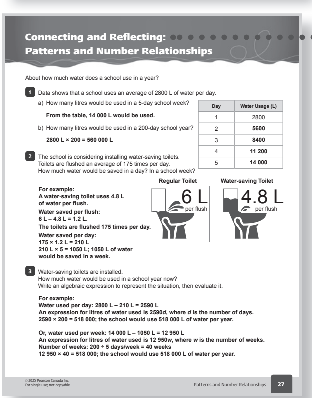
How Is the Workbook Organized?

Each unit connects the learning across several lessons.









What I Know
- activates prior knowledge of major concepts
- provides pre-assessment of students' understanding and knowledge
- helps you identify students who may need additional support

Checking In
- provides opportunities for students to apply their knowledge and understanding of concepts, make connections to math in the real world, reflect and discuss their thinking and strategies, and show what they know

Bringing It Together
- allows students to work together to discuss thinking and strategies
- helps students show what they know
- presents many open-ended tasks or games

What I Learned
- allows students to reflect on what they have learned and record their understanding
- prompts students to focus on the major understandings and concepts
- provides a snapshot of students' learning

Connections question
- enables students to create their own notes on connections made visible in the moment

Connecting and Reflecting
- connects the learning across a practice cluster with students' lived experiences

Sample student answers are included throughout the resource.

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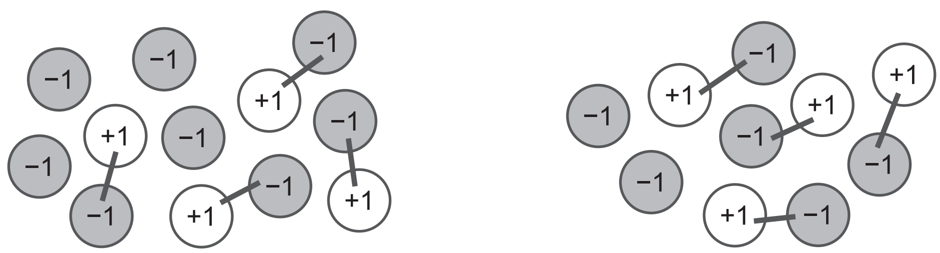
Unit 12 Fluency with Operations

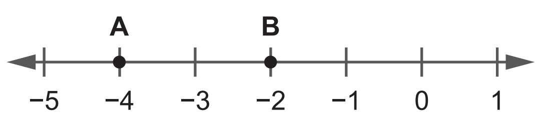
What I Know

Which group represents the greater number? Explain how you know.
Confirm your answer by plotting the numbers on a number line.

Group A **Group B**



For example:
I made zero pairs with positive and negative counters.
In Group A, I was left with 4 negatives. In Group B, I was left with 2 negatives.
–2 > –4, so Group B represents the greater number.

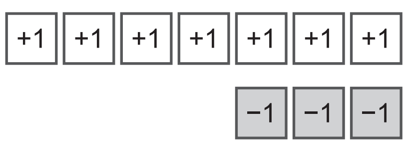


Checking In

Adding and Subtracting Integers

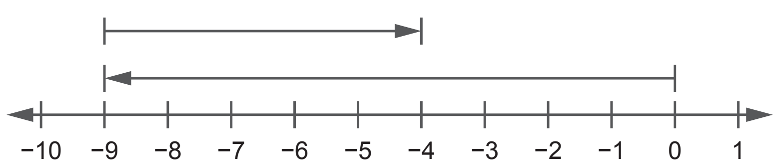
1 Write an expression to describe each sum or difference, then add or subtract.

a)



7 + (–3) = 4 or 4 – (–3) = 7

b)



(–9) + 5 = –4 or (–9) – (–5) = –4

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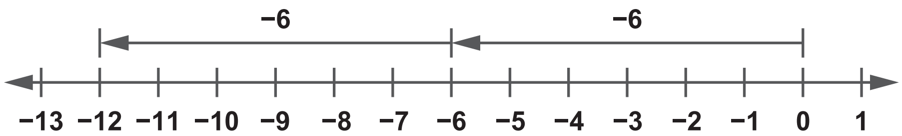
2 For each expression, use a model of your choice to determine the sum or difference.

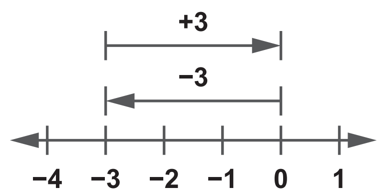
a) (–6) + (–6)

For example: (–6) + (–6) = –12



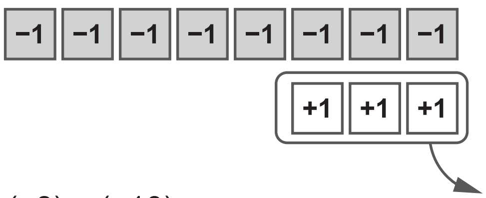
b) (–3) + 3

For example: (–3) + 3 = 0
The integers are opposite integers (they have opposite signs) and their addition results in no change.



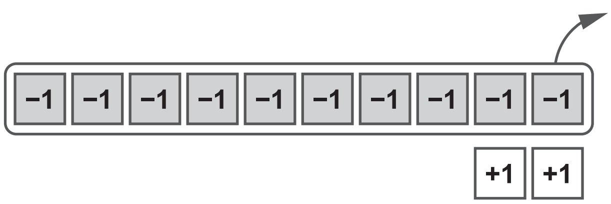
c) (–5) – 3

For example: (–5) – 3 = –8



d) (–8) – (–10)

For example: (–8) – (–10) = 2



3 In golf, *par* is how many strokes a player is expected to take to sink the ball on a particular hole. A negative score means the player took fewer strokes.

This is a scorecard for a 9-hole mini-golf course. What is the player's final score?

For example:
I noticed 2 zero-pairs of –1 and +1.
The rest were zeros except for one –1 and one –2.

So, the player's final score is (–1) + (–2) = –3.

SCORECARD

Hole	Score
1	–1
2	0
3	–1
4	+1
5	0
6	–1
7	–2
8	+1
9	0

0
0

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4 **GAME: Integer Battle!**

You will need a deck of cards with the face cards removed. Aces are 1.
Red cards represent negative integers and black cards represent positive integers.
Decide who will be Player A and who will be Player B.

- Shuffle the cards and place them face down in a spread-out pile.
- Each of you draw a card. Find the sum of the two cards.
- Player A scores a point if the sum is positive.
  Player B scores a point if the sum is negative.
  If the sum is 0, no points are scored.
- Continue to draw cards. The first player to get 5 points wins.

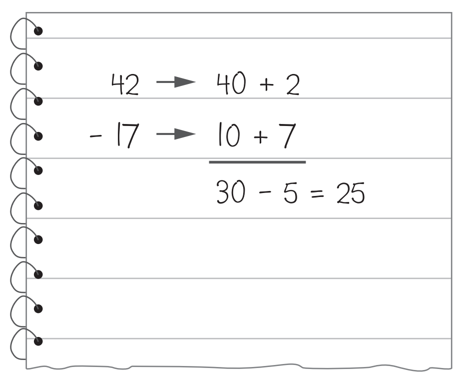
5 A person got on the elevator on Floor 8. Their car was parked on Floor –2. The elevator made no stops on the way down and took 3 s to descend each floor. How long was the elevator ride?

For example:
8 – (–2) = 10, but there is no Floor 0, so 10 – 1 = 9.
9 × 3 = 27; the ride took 27 s.

6 **PUZZLE: Magic Square!**
In a magic square, the sum of every row, column, and diagonal is the same.
Fill in the missing numbers to complete this magic square.

1	−6	**2**
0	−1	−2
−4	**4**	**−3**

7 Jasmine told Maribel that they had $42 and then spent $17. Maribel did this calculation to determine how much money Jasmine had left. Was Maribel correct?
If so, why would their strategy work?
How could Maribel's knowledge of subtracting integers help them subtract with whole numbers?



For example: Maribel was correct. The difference between 2 and 7 is (–5). So, they were 5 short in the ones, which was made up for by the difference of 30 in the tens. Maribel did not have to borrow from the tens column because they were able to subtract as they would with integers.

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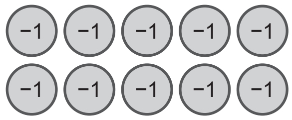
Multiplying and Dividing Integers

8 What multiplication and division statements could this model represent?



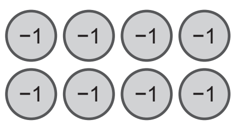
I see two groups of –5 or 5 groups of –2, so my statements are:
2 × (–5) = –10 (–10) ÷ 2 = –5
5 × (–2) = –10 (–10) ÷ 5 = –2

9 **ACTIVITY: Creating Expressions**
Use combinations of these cards to create a multiplication expression and a division expression. A card may be used more than once and not all cards have to be used.
Then evaluate each expression.
Use counters or a number line if they help.

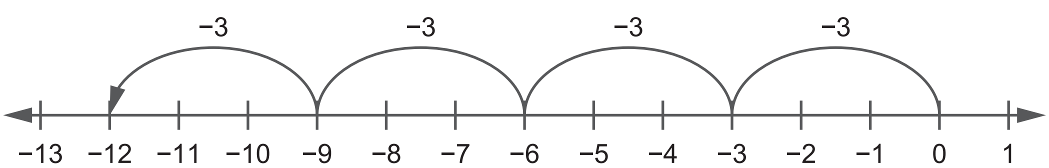
4 **−3** **−2** **−12** **×** **÷**

HINT
The value of the expression does not have to be on a card.

For example:
4 × (–2) = –8



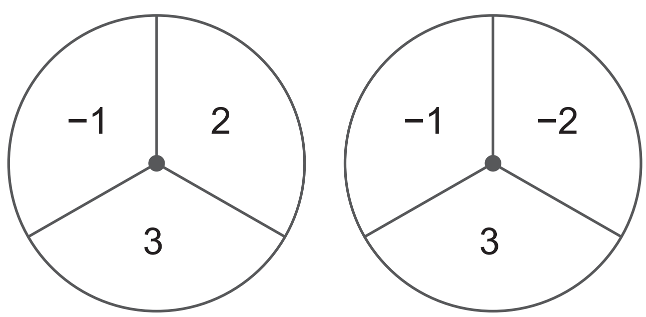
(–12) ÷ (–3) = 4



10 In a game, you spin the pointer on each of these spinners, find the product of the two numbers, then move that many spaces.
What is the farthest forward you could move?
What is the farthest backward you could move?
Show your thinking.

Farthest forward:
The greatest possible product is 3 × 3 = 9.
I could move 9 spaces forward.

Farthest backward:
The least possible product is 3 × (–2) = –6.
I could move 6 spaces backward.



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11 Write as many different integer expressions as you can that have a product or quotient of 6.

For example:

1 × 6	**(–1) × (–6)**	**6 ÷ 1**	**(–6) ÷ (–1)**
6 × 1	**(–6) × (–1)**	**12 ÷ 2**	**(–12) ÷ (–2)**
2 × 3	**(–2) × (–3)**	**18 ÷ 3**	**(–18) ÷ (–3)**
3 × 2	**(–3) × (–2)**		

12 When an above-ground pool is drained for the winter, the height of the water decreases at a rate of 8 cm/h. Use integers to write an expression to represent how the height of the water has changed after 6 h. Evaluate the expression. What happened to the height of the water?

6 × (–8) = –48
The product is negative.
So, after 6 h, the height of the water has decreased by 48 cm.

13 **PUZZLE: Guess My Integers!**

a) I am thinking of two integers. Their product is –36 and their quotient is –4. What could my integers be? Explain your strategy.

For example:
I used positive numbers first:
A × B = 36 and A ÷ B = 4.
A × B is 9 times greater than A ÷ B. This makes me think that B may be 3. In the first equation, that would make A = 12 because 12 × 3 = 36. This also works for the second equation because 12 ÷ 3 = 4.
Because the answers are negative, I know the numbers have opposite signs.
So, A = 12 and B = –3, or A = –12 and B = 3.

b) Think of two integers and write your own riddle. Include a product and/or quotient, and other clues as well. Trade riddles with a partner and solve each other's riddle.

For example:
I chose –3 and –6.

I am thinking of two integers. Their product is 18. One of my integers is double the other. The sum of my integers is negative. What could my integers be?

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14 **CHALLENGE:** Create and solve a subtraction word problem that involves an activity you do. You may use decimals, fractions, or integers. Then, add to your word problem by asking a question that can be solved using division.

For example:
I jogged for 3.6 km. My friend jogged for 1.2 km. How much farther did I jog?
3.6 – 1.2 = 2.4; I jogged 2.4 km farther.

How many times farther did I jog than my friend?
3.6 ÷ 1.2 = 3; I jogged 3 times farther than my friend.

15 Evaluate each expression, then order the expressions from least to greatest value.

a) 4.5×0.6

$$\begin{array}{r} \mathbf{4.0 \times 0.6 = 2.4} \\ \underline{\mathbf{+\ 0.5 \times 0.6 = 0.3}} \\ \mathbf{4.5 \times 0.6 = 2.7} \end{array}$$

b) 15% of 16

$$\begin{array}{r} \mathbf{10\%\ of\ 16 = 1.6} \\ \underline{\mathbf{+\ 5\%\ of\ 16 = 0.8}} \\ \mathbf{15\%\ of\ 16 = 2.4} \end{array}$$

c) $(–7) – (–10)$

$(–7) + 10 = 3$

From least to greatest: 2.4, 2.7, 3.
So, expressions from least to greatest value: 15% of 16, 4.5 × 0.6, (–7) – (–10).

16 A pool has a diving platform at a height of 5 m.
Use integers to solve each problem.

a) Amira dives off the platform.
They land at a depth of 3 m. What is the difference between the height of the platform and Amira’s depth?

$5 – (–3) = 8$
The difference is 8 m.

b) Amira then swims down another 2 m.
At what depth is Amira now?

$(–3) + (–2) = –5$
Amira is now 5 m below the surface of the water.

17 Place operations in the boxes to make a true statement.
Can you find another possible answer? Explain.

$3.2\ \boxed{+}\ 0.8 = (−8)\ \boxed{+}\ 12$

$3.2\ \boxed{\div}\ 0.8 = (−8)\ \boxed{+}\ 12$

I knew the right side would be an integer, so I looked at the decimals. Neither multiplying nor subtracting would give a whole number. Whether I add or divide, I get 4. So, I needed to add on the right side to get 4 as well. Two answers are possible.

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18 Identify as many similarities and differences as you can between these expressions:

$5\frac{1}{6} - 3\frac{2}{3}$

$5.1 - 3.4$

For example:

Similarities	Differences
- both have 5 wholes minus 3 wholes **- both have parts which are smaller than one whole** **- both can be evaluated using improper fractions (e.g., $\frac{51}{10} - \frac{34}{10}$)** **- the fraction/decimal part of the second number is larger than that of the first, so I could borrow (regroup)** **- if I make common denominators, the numerators of matching numbers are the same ($\frac{1}{6}$ and $\frac{1}{10}$, $\frac{4}{6}$ and $\frac{4}{10}$)**	**- the first expression has fractions, and the second expression has decimals** **- the first expression has unlike denominators (thirds and sixths), while the numbers in the second expression are both in tenths** **- the answers are different ($1\frac{1}{2}$ and 1.7)**

19 Use each of the digits from 1 to 6 to make the least possible product. The fractions must be proper fractions.

$$\boxed{1}\,\frac{\boxed{3}}{\boxed{6}} \times \boxed{2}\,\frac{\boxed{4}}{\boxed{5}}$$

The least product I can make is $4\frac{1}{5}$.

20 Evaluate this expression.

6 – (–2) × (–4) + 3 **= 6 – 8 + 3**
= 1

- Add one pair of brackets to make the answer bigger.
- Add one pair of brackets to make the answer smaller.

Bigger answer: 6 – (–2) × [(–4) + 3] = 6 – (–2)(–1)
= 6 – 2, or 4

Smaller answer: 6 – [(–2) × (–4) + 3] = 6 – (8 + 3)
= 6 – 11, or –5
Or, [6 – (–2)] × (–4) + 3 = 8 × (–4) + 3
= –32 + 3, or –29

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Bringing It Together

21 **GAME: Four in a Row**

You will need one game board and a deck of cards. Aces are 1, and face cards are 10. Red cards represent negative integers and black cards represent positive integers. Shuffle the cards and place them face down in a pile.

Part A: Adding and Subtracting Integers

- Take turns to draw two cards. You may choose to add or subtract the integers.
- Player A: Draw a circle around your answer on the gameboard.
  Player B: Draw a triangle around your answer on the game board.
- An answer can only be marked once.
  If you are not able to mark the gameboard with a new integer, you lose your turn.
- The first player to get 4 in a row (horizontally, vertically, or diagonally) wins.

Part B: Operations with Integers

Play the game as above, but with each turn, you may choose to add, subtract, multiply, or divide your two integers.

			−20				
			−19	−18			
		−17	−16	−15	−14		
	−13	−12	−11	−10	−9	−8	
−7	−6	−5	−4	−3	−2	−1	0
1	2	3	4	5	6	7	8
	9	10	11	12	13	14	
		15	16	17	18		
			19	20			

What I Learned

Choose two integer operations (addition, subtraction, multiplication, division).
Explain in as many ways as you can how these two operations are related.

For example: Addition and subtraction are related. Subtracting an integer gives the same answer as adding the opposite integer. I usually think of subtracting when I add a positive and a negative integer. When I subtract two numbers, I sometimes use an adding up strategy.

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