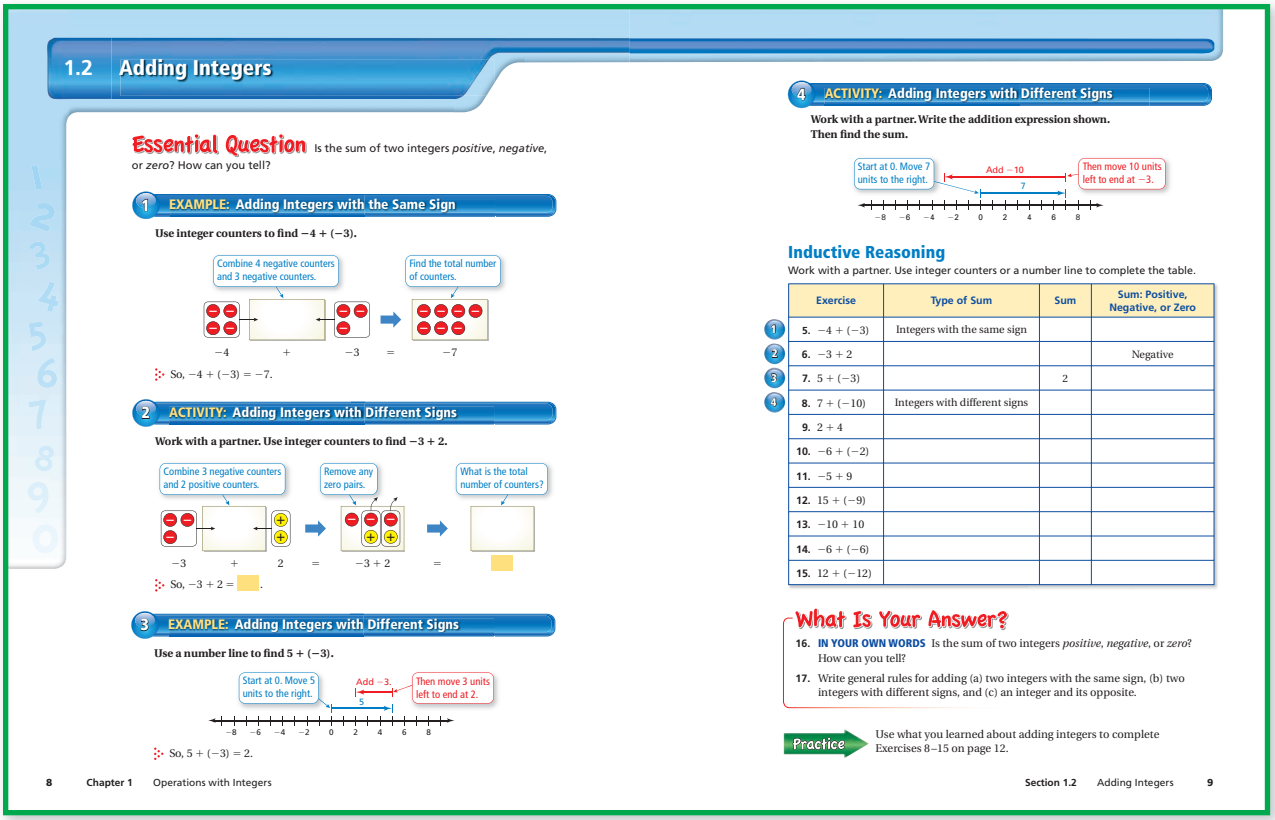
Inductive Reasoning

Big Ideas Math stresses the importance of hands-on inductive reasoning. Each Activity begins with an **Essential Question**, such as "*Is the sum of two integers positive, negative, or zero? How can you tell?*" To answer this question, students begin with several examples, whose sums they find using integer counters or a number line. Then, working with a partner, students summarize their findings in a table and use inductive reasoning to write their own rule for finding the sum of two integers.

In practice, students tend to come up with correct, but informal rules, such as "the sign of the sum is determined by the bigger number." In the Lesson, this rule can be formalized using the concept of absolute value.



1.2 Adding Integers

Essential Question Is the sum of two integers *positive*, *negative*, or *zero*? How can you tell?

1 EXAMPLE: Adding Integers with the Same Sign

Use integer counters to find −4 + (−3).

Combine 4 negative counters and 3 negative counters.

Find the total number of counters.

−4 + −3 = −7

∴ So, −4 + (−3) = −7.

2 ACTIVITY: Adding Integers with Different Signs

Work with a partner. Use integer counters to find −3 + 2.

Combine 3 negative counters and 2 positive counters.

Remove any zero pairs.

What is the total number of counters?

−3 + 2 = −3 + 2 =

∴ So, −3 + 2 = .

3 EXAMPLE: Adding Integers with Different Signs

Use a number line to find 5 + (−3).

Start at 0. Move 5 units to the right.

Add −3.

Then move 3 units left to end at 2.

∴ So, 5 + (−3) = 2.

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4 ACTIVITY: Adding Integers with Different Signs

Work with a partner. Write the addition expression shown. Then find the sum.

Start at 0. Move 7 units to the right.

Add −10

Then move 10 units left to end at −3.

Inductive Reasoning

Work with a partner. Use integer counters or a number line to complete the table.

	Exercise	Type of Sum	Sum	Sum: Positive, Negative, or Zero
1	5. −4 + (−3)	Integers with the same sign		
2	6. −3 + 2			Negative
3	7. 5 + (−3)		2	
4	8. 7 + (−10)	Integers with different signs		
	9. 2 + 4			
	10. −6 + (−2)			
	11. −5 + 9			
	12. 15 + (−9)			
	13. −10 + 10			
	14. −6 + (−6)			
	15. 12 + (−12)			

What Is Your Answer?

16. **IN YOUR OWN WORDS** Is the sum of two integers *positive*, *negative*, or *zero*? How can you tell?

17. Write general rules for adding (a) two integers with the same sign, (b) two integers with different signs, and (c) an integer and its opposite.

Practice Use what you learned about adding integers to complete Exercises 8–15 on page 12.

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