3 Develop the Concept: Visual

ELL STRATEGY Visual Learning

Visual Learning

Variables and Expressions

How can you translate words into expressions?

What expression shows the weight of the mixed nuts after the weight of the jar is subtracted?

A variable is a letter or symbol that represents an unknown amount that can vary, or change.

Which weight is known, the weight of the jar or the weight of the jar of nuts? [The total weight of the jar] *Which is unknown?* [The total weight of the jar and the mixed nuts]

An algebraic expression is a mathematical phrase involving variables, numbers, and operations.

Operation	Word Phrase	Algebraic Expression
Addition	a number *plus* 4 a number *added* to 4	$w + 4$
Subtraction	a number *minus* 4 a number *less* 4	$w - 4$
Multiplication	4 *times* a number	$4 \times w$ or $4w$
Division	a number *divided* by 4	$w \div 4$ or $\frac{w}{4}$

1 Visual Learning

Set the Purpose Call students' attention to the **Visual Learning Bridge** at the top of the page. *In this lesson, you will learn how to write algebraic expressions from words using variables.*

Animated Glossary Students can see highlighted words defined in the Online Student Edition.
algebraic expression, variable
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2 Guided Practice

Formative Assessment

Remind students to use the words to help them choose the operation. Words such as *sum* and *total* mean "add." Words such as *difference* and less mean "*subtract.*"

Exercise 6
Error Intervention

If students have difficulty explaining why a variable is used,

then reinforce the meaning of *variable*. *In the example at the top, what is a variable?* [Something that can change] *In the example at the top, what can change?* [The weight of the nuts]

Reteaching Have students identify phrases that signal the use of multiplication and division in Exercises 1 and 4. Examples: *twice the number* and *into*. For another example and more practice, assign **Reteaching** Set A on p. 166.

3 Independent Practice

Remind students not to get hung up on the letters for the variables. The variables stand for the term "a number." In Exercise 16, when "a number" is decreased by 12, that means that 12 is subtracted. *How could you represent a number you don't know?* [Any letter can be used, for example, *n*.] *How would you show "the number is decreased by 12"?* [$n - 12$] *Does it matter where the* n *goes in the expression?* [Yes, because $12 - n$ means that 12 is decreased by some number, not that a number is decreased by 12.]

Lesson 6-1

Understand It! Variables can be used to write algebraic expressions that describe real-world situations.

Variables and Expressions

How can you translate words into expressions?

What expression shows the weight of the mixed nuts after the weight of the jar is subtracted?

A variable is a letter or symbol that represents an unknown amount that can vary, or change.

Guided Practice*

Do you know HOW?

In **1** through **4**, use a variable to write an algebraic expression that represents the word phrase.

1. twice the number of people
   $2 \times p$ or $2p$
2. $7 less than the current price
   $p - 7$
3. 8 more gumballs than Javier has
   $j + 8$
4. a number of students divided into 2 teams
   $s \div 2$ or $\frac{s}{2}$

Do you UNDERSTAND?

5. What would the expression for the weight of the mixed nuts be if the weight of the jar was 8 oz?
   $w - 8$
6. **Writing to Explain** Why is a variable used in the example at the top?
   See margin.
7. Write two word phrases that could be translated as $25 \times p$.
   Sample answer: 25 multiplied by a number; the product of 25 and a number

Independent Practice

For **8** through **11**, translate each algebraic expression into words.
8–11 See margin.

8. $n + 9$
9. $x \div 12$
10. $y - 4$
11. $8m$

For **12** through **20**, write each word phrase as an algebraic expression.

12. subtract a number from 10
    $10 - n$
13. the product of 9 and a number
    $9 \times n$ or $9n$
14. add 6 to a number
    $6 + n$
15. 6 divided by a number
    $6 \div n$ or $\frac{6}{n}$
16. a number decreased by 12
    $n - 12$
17. 9 plus a number
    $9 + n$
18. a number added to 19
    $n + 19$ or $19 + n$
19. the quotient of a number and 8
    $n \div 8$ or $\frac{n}{8}$
20. 4 less a number
    $4 - n$

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6. A variable is used because the weight of the mixed nuts is unknown.
8. 9 more than a number
9. a number divided by 12
10. a number minus 4
11. 8 times a number