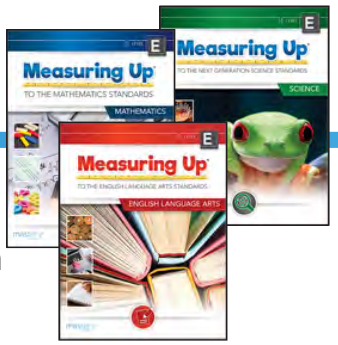
Try It Out! Sample Pack | Math | Grade 6 | Lesson 18
Measuring Up to the Standards



The **Try It Out!** sample pack features:

- 1 full student lesson with complete Teacher Edition lesson
- 1 full Table of Contents for your grade level
- Correlation to the standards

Developed to meet the rigor of the standards, ***Measuring Up*** employs support for using and applying critical thinking skills with direct standards instruction that elevate and engage student thinking.

Standards-based lessons feature introductions that set students up for success with:

- ✔ Vocabulary in Action
- ✔ Relevant real-world connections
- ✔ Clearly identified learning goals
- ✔ Connections to prior learning

Guided Instruction and Independent Learning strengthen learning with:

- ✔ Deep thinking prompts
- ✔ Collaborative learning
- ✔ Self-evaluation
- ✔ Demonstration of problem-solving logic
- ✔ Application of higher-order thinking

Flexible design meets the needs of whole- or small-group instruction. Use for:

- ✔ Introducing standards
- ✔ Reinforcement or standards review
- ✔ Intervention
- ✔ Remediation
- ✔ Test Preparation

Extend learning with online digital resources!

Measuring Up Live 2.0 blends instructional print resources with online, dynamic assessment and practice. Meet the needs of all students for standards mastery with resources that pinpoint student needs with customized practice.

MasteryEducation.com | 800-822-1080 | Fax: 201-712-0045

Measuring Up® from mastery education

WORDS TO KNOW

algebraic expression

term

variable

coefficient

constant

Lesson 18

READ AND WRITE EXPRESSIONS WITH VARIABLES 6.EE.A.2, 6.EE.A.2.a, 6.EE.A.2.b, 6.EE.B.6

INTRODUCTION

Real-World Connection

Ellis was hired to water his neighbors' flowers when they go on vacation. He charges $5 to start, plus an additional $7 per week. Ellis can write an algebraic expression to represent how much he can earn for any number of weeks that he works. Let's practice the skills in the **Guided Instruction** and **Independent Practice** and see what expression Ellis uses at the end of the lesson!

What I Am Going to Learn

- How to read and write expressions using numbers and variables
- To identify parts of an expression

What I May Already Know 5.OA.A.1, 6.EE.A.2

- I know how to write and interpret numerical expressions.
- I know how to write and evaluate expressions with letters standing in for numbers.

Vocabulary in Action

- An **algebraic expression** is a mathematical statement made up of **terms**, involving numbers, at least one operation, and one or more **variables**.
  - A variable is a letter that represents an unknown number in an expression.
  - A term is a number or variable, or a number and variable grouped together. Terms are separated by $+$, $-$, $\times$, or $\div$.
  - A **coefficient** is a number being multiplied by the variable.
  - A **constant** is a number by itself, added or subtracted.

EXAMPLE

Identify the parts of the algebraic expression $7x + 5$.

There are 2 terms: $7x$ and 5.

7 is the coefficient of x.

x is the variable.

5 is a constant.

EXAMPLE

Identify the parts of the algebraic expression $4y + 7 - 10$.

There are 3 terms: $4y$, 7, and 10.

4 is the coefficient of y.

y is the variable.

7 and 10 are constants.

An algebraic expression can be described in words, then translated into mathematical language. Look for keywords that indicate operations or variables. When more than one operation is involved, make sure you think about the order of the terms.

EXAMPLE

"The sum of an unknown number, a, and 6" can be written as $a + 6$ or $6 + a$.

"A number multiplied by 20" can be written as $d \times 20$, $20 \times d$, or $20d$.

"8 less than 5 times a number" can be written as $5x - 8$.

"12 less than a number, r" can be written as $r - 12$.

THINK ABOUT IT

When writing an expression with a variable, choose the letter, but avoid letters that look like numbers: *g*, *i*, *l*, *o*.

GUIDED INSTRUCTION

1. **Identify the number of terms, variables, coefficients, and constants in the expression $7x + 4y + 10$.**

Step One How many terms are there?

There are _____ terms.

Step Two What are the variables?

There are two variables, x and _____.

TIPS AND TRICKS

A constant does not change. A variable varies. A coefficient implies a partner, like a coworker.

Step Three What are the coefficients?

There are two coefficients, one multiplying each variable:

7 and [ ].

Step Four Is there a constant?

Yes, [ ] is the constant.

TIPS AND TRICKS

Break down each part of the description to make it easier to see the parts of the expression.

2. **Write an expression that represents the amount of money Alex has: Fred has some money (m), and then spends $12. Alex has 3 times as much money as Fred has now.**

Step One Look for words that indicate which operations to use, like "has some money".

The amount Fred has is unknown: m

Step Two Decide which operation comes first.

12 less than a number needs to be multiplied by 3. So, write the subtraction expression first: "and then spends $12".

If Fred spends $12, he has $12 less than before:

$m - 12$

Step Three Include any other operations.

"Alex has 3 times as much money as Fred". Multiply the difference by 3:

Fred has $m - 12$ dollars, so multiply that expression by 3:

[3] ([$m - 12$])

3. **Which expressions represent the sum of c and 12 divided by 3? Select the two correct answers.**

Ⓐ $(12 + 3) \div c$

Ⓑ $(c + 12) \div 3$

Ⓒ $\frac{(12 + 3)}{c}$

Ⓓ $\frac{(c + 12)}{3}$

Ⓔ $c \div 12 + 3$

How Am I Doing?

What questions do you have?

If you have 3 less than 5 times as many jelly beans as your friend, and your friend has 12 jelly beans, how many do you have?

What is an example of a situation in real life where some quantity was described that could have been shown as an expression?

TURN AND TALK

Explain the difference between a factor and a coefficient.

Color in the traffic signal that shows how you are doing with the skill.

INDEPENDENT PRACTICE

Answer the questions.

TIPS AND TRICKS

Based on the question, you know that there are two correct answers, so you can eliminate three of the choices.

1. Which expressions represent twice the sum of a number (t) and 15? Select the two correct answers.

Ⓐ $2(t + 15)$

Ⓑ $2 \times t + 15$

Ⓒ $(15 + t) \times 2$

Ⓓ $(2 + t) \times 15$

Ⓔ $15 + t \times 2$

HINT, HINT

Order is important when writing expressions. Make sure the expression shows exactly what is described in words.

2. Circle the expression that correctly completes the statement.

An algebraic expression for 8 less than the product of 4 and a number (x) is [$8 - 4x$ / $4x - 8$ / $8x - 4$ / $4(x - 8)$].

3. Circle the number that correctly completes the statement.

In the expression $14 + 7a - 10 \times 5b$, there are [2 / 3 / 4 / 6 / 7] terms.

4. In the expression $5y + 4 \times 2$, what is the coefficient?

Write your answer in the box.

[ ]

5. Write an algebraic expression for "6 more than the product of a number (y) and 4".

Write your answer in the box.

6. Tom spends some money (m) at the candy store and $13 at the arcade. The next day, he spends the same amount at the candy store and arcade. Which two expressions represent Tom's spending for the two days?

Ⓐ $2(13 + m)$

Ⓑ $2m + 13$

Ⓒ $m + 13 \times 2$

Ⓓ $13 + 13 + 2m$

Ⓔ $2 \times 13 + m$

HINT, HINT

Tom spent m dollars twice and $13 twice.

WORK SPACE

7. Sarah earns $10 every time she babysits. She also gets an allowance of a dollars each week. If Sarah babysits once a week for 4 weeks, and she spends $20 on clothes one time, which expression represents how much money she has?

Ⓐ $4(10 + a) - 20$

Ⓑ $4a + 10 - 20$

Ⓒ $4(10 + a - 20)$

Ⓓ $20 - 4(10 + a)$

8. Part A

Describe the expression $3x + 10 - 2x$ in words.

Part B

For the expression in Part A, identify the variables, constants, and coefficients.

WORK SPACE

9. Describe a situation that would be represented by the expression $4x + 5$.

10. A rectangle is 3 feet longer than its width. What expression shows the perimeter of the rectangle? Explain how you know.

11. Rob is twice as tall as Sue was when she was 6 inches shorter. If s represents Sue's height now, what expression represents Rob's height? Explain how you know.

EXIT TICKET

6.EE.A.2, 6.EE.A.2.a, 6.EE.A.2.b, 6.EE.B.6

Now that you have mastered reading and writing expressions with variables, let's solve the problem in the Real-World Connection.

Ellis was hired to water his neighbors' flowers when they go on vacation. He charges $5 to start, plus an additional $7 per week. Ellis can write an algebraic expression to represent how much he can earn for any number of weeks that he works.

What expression should Ellis use?

If *w* represents the number of weeks, Ellis should use this expression:_____

ANNOTATED
TEACHER EDITION

MasteryEducation.com | 800-822-1080 | Fax: 201-712-0045

Measuring Up®
from mastery education

CONTENTS

Introduction

Chapter 1 RATIOS AND RATES

Chapter 2 NUMBER AND OPERATIONS

CONTENTS

Chapter 3 EXPRESSIONS AND EQUATIONS

Chapter 4 GEOMETRY

Chapter 5 STATISTICS

References

CORRELATIONS

Correlation to the Common Core State Standards

This worktext is customized to the Common Core State Standards for Mathematics.
Most lessons focus on one content standard for in-depth review.
Mathematical Practices are interwoven throughout each lesson to connect practices to content at point-of-use and promote depth of understanding.

Common Core State Standards	Lessons
6.RP Ratios and Proportional Relationships	
A. Understand ratio concepts and use ratio reasoning to solve problems.	
1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*	1
2. Understand the concept of a unit rate $\frac{a}{b}$ associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $\frac{3}{4}$ cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*	2
3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.	3, 4, 5, 6
a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	3
b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*	4
c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $\frac{30}{100}$ times the quantity); solve problems involving finding the whole, given a part and the percent.	5
d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	6
6.NS The Number System	
A. Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	
1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for $(\frac{2}{3}) \div (\frac{3}{4})$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(\frac{2}{3}) \div (\frac{3}{4}) = \frac{8}{9}$ because $\frac{3}{4}$ of $\frac{8}{9}$ is $\frac{2}{3}$. (In general, $(\frac{a}{b}) \div (\frac{c}{d}) = \frac{ad}{bc}$.) How much chocolate will each person get if 3 people share $\frac{1}{2}$ lb of chocolate equally? How many $\frac{3}{4}$-cup servings are in $\frac{2}{3}$ of a cup of yogurt? How wide is a rectangular strip of land with length $\frac{3}{4}$ mi and area $\frac{1}{2}$ square mi?*	7
B. Compute fluently with multi-digit numbers and find common factors and multiples.	
2. Fluently divide multi-digit numbers using the standard algorithm.	8
3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	9, 10

Common Core State Standards	Lessons
4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4(9 + 2).*	11
C. Apply and extend previous understandings of numbers to the system of rational numbers.	
5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	12
6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.	12, 13
a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.	12
b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.	13
c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	13
7. Understand ordering and absolute value of rational numbers.	14, 15
a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.*	14
b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write –3 °C > –7 °C to express the fact that –3 °C is warmer than –7 °C.*	14
c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.*	15
d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.*	15
8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	16
6.EE Expressions and Equations	
A. Apply and extend previous understandings of arithmetic to algebraic expressions.	
1. Write and evaluate numerical expressions involving whole-number exponents.	17
2. Write, read, and evaluate expressions in which letters stand for numbers.	18, 19
a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.*	18

CORRELATIONS

Common Core State Standards	Lessons
b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2(8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.*	18
c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas* $V = s^3$ *and* $A = 6\ s^2$ *to find the volume and surface area of a cube with sides of length* $s = \frac{1}{2}$.	19
3. Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3(2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6(4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*	20
4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*	20
B. Reason about and solve one-variable equations and inequalities.	
5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	21, 22
6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	18
7. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.	21
8. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	22
C. Represent and analyze quantitative relationships between dependent and independent variables.	
9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*	23
6.G Geometry	
A. Solve real-world and mathematical problems involving area, surface area, and volume.	
1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	24
2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	25

Common Core State Standards	Lessons
3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	26
4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	27, 28
6.SP Statistics and Probability	
A. Develop understanding of statistical variability.	
1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*	30
2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	30
3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.	29
B. Summarize and describe distributions.	
4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	31, 32
5. Summarize numerical data sets in relation to their context, such as by:	33
a. Reporting the number of observations.	33
b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	33
c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.	33
d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	33

CHAPTER 3

WORDS TO KNOW

algebraic expression

term

variable

coefficient

constant

Lesson 18

READ AND WRITE EXPRESSIONS WITH VARIABLES 6.EE.A.2, 6.EE.A.2.a, 6.EE.A.2.b, 6.EE.B.6

INTRODUCTION

Real-World Connection

Ellis was hired to water his neighbors' flowers when they go on vacation. He charges $5 to start, plus an additional $7 per week. Ellis can write an algebraic expression to represent how much he can earn for any number of weeks that he works. Let's practice the skills in the Guided Instruction and Independent Practice and see what expression Ellis uses at the end of the lesson!

What I Am Going to Learn

- How to read and write expressions using numbers and variables
- To identify parts of an expression

What I May Already Know 5.OA.A.1, 6.EE.A.2

- I know how to write and interpret numerical expressions.
- I know how to write and evaluate expressions with letters standing in for numbers.

Vocabulary in Action

- An algebraic expression is a mathematical statement made up of terms, involving numbers, at least one operation, and one or more variables.
  - A variable is a letter that represents an unknown number in an expression.
  - A term is a number or variable, or a number and variable grouped together. Terms are separated by $+$, $-$, $\times$, or $\div$.
  - A coefficient is a number being multiplied by the variable.
  - A constant is a number by itself, added or subtracted.

Step Three What are the coefficients?

There are two coefficients, one multiplying each variable:

7 and 4.

Step Four Is there a constant?

Yes, 10 is the constant.

TIPS AND TRICKS

Break down each part of the description to make it easier to see the parts of the expression.

2. **Write an expression that represents the amount of money Alex has: Fred has some money (m), and then spends $12. Alex has 3 times as much money as Fred has now.**

Step One Look for words that indicate which operations to use, like "has some money".

The amount Fred has is unknown: m

Step Two Decide which operation comes first.

12 less than a number needs to be multiplied by 3. So, write the subtraction expression first: "and then spends $12".

If Fred spends $12, he has $12 less than before:

$m - 12$

Step Three Include any other operations.

"Alex has 3 times as much money as Fred". Multiply the difference by 3:

Fred has $m - 12$ dollars, so multiply that expression by 3:

3 ($m - 12$)

3. **Which expressions represent the sum of c and 12 divided by 3? Select the two correct answers.**

Ⓐ $(12 + 3) \div c$

Ⓑ $(c + 12) \div 3$

Ⓒ $\frac{(12 + 3)}{c}$

Ⓓ $\frac{(c + 12)}{3}$

Ⓔ $c \div 12 + 3$

How Am I Doing?

What questions do you have?

If you have 3 less than 5 times as many jelly beans as your friend, and your friend has 12 jelly beans, how many do you have?

What is an example of a situation in real life where some quantity was described that could have been shown as an expression?

TURN AND TALK

Explain the difference between a factor and a coefficient.

Color in the traffic signal that shows how you are doing with the skill.

INDEPENDENT PRACTICE

Answer the questions.

TIPS AND TRICKS

Based on the question, you know that there are two correct answers, so you can eliminate three of the choices.

1. Which expressions represent twice the sum of a number (t) and 15? Select the two correct answers.

   Ⓐ $2(t + 15)$
   Ⓑ $2 \times t + 15$
   Ⓒ $(15 + t) \times 2$
   Ⓓ $(2 + t) \times 15$
   Ⓔ $15 + t \times 2$

HINT, HINT

Order is important when writing expressions. Make sure the expression shows exactly what is described in words.

2. Circle the expression that correctly completes the statement.

   An algebraic expression for 8 less than the product of 4 and a number (x) is [$8 - 4x$ / $4x - 8$ / $8x - 4$ / $4(x - 8)$].

3. Circle the number that correctly completes the statement.

   In the expression $14 + 7a - 10 \times 5b$, there are [2 / 3 / 4 / 6 / 7] terms.

4. In the expression $5y + 4 \times 2$, what is the coefficient?

   Write your answer in the box.

   [5]

5. Write an algebraic expression for "6 more than the product of a number (y) and 4".

   Write your answer in the box.

   [$4y + 6$]

6. Tom spends some money (m) at the candy store and \$13 at the arcade. The next day, he spends the same amount at the candy store and arcade. Which two expressions represent Tom's spending for the two days?

   Ⓐ $2(13 + m)$
   Ⓑ $2m + 13$
   Ⓒ $m + 13 \times 2$
   Ⓓ $13 + 13 + 2m$
   Ⓔ $2 \times 13 + m$

HINT, HINT

Tom spent m dollars twice and \$13 twice.

7. Sarah earns \$10 every time she babysits. She also gets an allowance of a dollars each week. If Sarah babysits once a week for 4 weeks, and she spends \$20 on clothes one time, which expression represents how much money she has?

   Ⓐ $4(10 + a) - 20$
   Ⓑ $4a + 10 - 20$
   Ⓒ $4(10 + a - 20)$
   Ⓓ $20 - 4(10 + a)$

8. **Part A**

   Describe the expression $3x + 10 - 2x$ in words.

   Sample answer: Take 3 times a number (x) and add 10 to it. Then take away twice the number (x).

   Part B

   For the expression in Part A, identify the variables, constants, and coefficients.

   Sample answer: The variable is x, the constant is 10, and the coefficients are 3 and -2.

WORK SPACE

WORK SPACE

9. Describe a situation that would be represented by the expression $4x + 5$.

Sample answer: David signs up for a video game rental service. It costs $5 to join and $4 for each video game rental.

10. A rectangle is 3 feet longer than its width. What expression shows the perimeter of the rectangle? Explain how you know.

Sample answer: Both the length and width are unknown, but the length is described in terms of the width. So, if w is the width, the length, l, is $w + 3$. Perimeter is the length around the rectangle, adding all four side lengths ($l + w + w + l$). $w + 3 + w + w + 3 + w$ is the perimeter.

11. Rob is twice as tall as Sue was when she was 6 inches shorter. If s represents Sue's height now, what expression represents Rob's height? Explain how you know.

Sample answer: When Sue was 6 inches shorter, she was $(s - 6)$ inches tall. Rob is twice that height: $2(s - 6)$

EXIT TICKET

6.EE.A.2, 6.EE.A.2.a, 6.EE.A.2.b, 6.EE.B.6

Now that you have mastered reading and writing expressions with variables, let's solve the problem in the Real-World Connection.

Ellis was hired to water his neighbors' flowers when they go on vacation. He charges $5 to start, plus an additional $7 per week. Ellis can write an algebraic expression to represent how much he can earn for any number of weeks that he works.

What expression should Ellis use?

If w represents the number of weeks, Ellis should use this expression: $5 + 7w$

If w represents the number of weeks Ellis works, $7w$ is how much he earns per week.

He also gets $5 at the start, so 5 is a constant: $5 + 7w$

TEACHER NOTES

REAL-WORLD GOALS FOR STUDENTS

- Students will understand how to read and write expressions using numbers and variables.
- Students will identify parts of an expression.

TIPS FOR THE STRUGGLING LEARNER

- Students may struggle with translating a written description into a mathematical expression. Often, students will write $12 - x$ instead of $x - 12$. Students should try to write an expression, then check if it makes sense. For example, "If I have $12 and spend some, that's $12 - x$. If I have some money and spend $12, that's $x - 12$."
- Students may have trouble with the vocabulary. Emphasize the importance of learning to identify *coefficients*, *variables*, *constants*, and *terms*, as students will use these words in more advanced math classes for years to come. Use of flashcards, discussing ways to remember the definitions, as well as repetition labeling the parts of expressions will help.

TIPS FOR THE ENGLISH LANGUAGE LEARNER

- English learners may struggle with the vocabulary used. Partner English learners with native speakers to practice identifying vocabulary terms in expressions. Encourage students to think about the common roots of vocabulary words. For instance, a *variable* varies; it can change. A *constant* stays the same; it does not change due to a variable. A *coefficient* is a variable's partner, as the prefix *co-* suggests.
- English learners may have difficulty translating written descriptions to expressions. Guide them to first identify words that indicate operations: *sum*, *more than*, *less*, *times as many*, and so on. Help English learners distinguish between subtle differences in word problems, and always have them refer to the order of operations.

ACTIVITIES FOR THE ADVANCED LEARNER

- Students can take more complicated expressions and translate them into words. It is sometimes more difficult to go from numbers to words, because the student has to think about order and what needs to be done first.
- Students can write more complex expressions with multiple terms.