

Lesson 3.1

November 19, 2013

Activity
3.1 **Warm Up**
For use before Activity 3.1

Evaluate the expression.

1. $7 + 64$

2. $139 - 25$

3. $150 - 67$

4. 5×18

5. 52×9

6. $250 \div 5$

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November 19, 2013

Essential Question

How can you write and evaluate an expression that represents a real-life problem?

Lesson 3.1

November 19, 2013

LessonTarget

To be able to:

- write and evaluate an expression wrien in words, focusing on units and how to evaluate an algebraic expression.

Self-Evaluation Rubric

Score	Description
4	I can teach other students how to write and evaluate an expression wrien in words, focusing on units and how to evaluate an algebraic expression.
3	I can write and evaluate an expression wrien in words, focusing on units and how to evaluate an algebraic expression.
2	I recognize how to write and evaluate an expression wrien in words, focusing on units and how to evaluate an algebraic expression.
1	I do not know how to write and evaluate an expression wrien in words, focusing on units and how to evaluate an algebraic expression.

Activity1

With a partner(s) work on
Activity 1 on page **57** in the so
cover Big Ideas and Pracce
Journal.

Activity2

With a partner(s) work on
Activity 2 on page **58 & 59** in
the so cover Big Ideas and
Pracce Journal.

Algebraic Expression

An expression that may contain numbers, operations, and one or more symbols.

Terms

Part of an algebraic expression.

The product of variables and/or constants.

Coeficient

The numerical factor of a term that contains a variable.

Constant

A term without a variable.

1 Identifying Parts of an Algebraic Expression

Identify the terms, coefficients, and constants in each expression.

a. $5x + 13$

$$\begin{array}{r}
 \underbrace{5x} + \underbrace{13} \\
 \text{Terms: } 5x, \quad 13 \\
 \text{Coefficient: } 5 \\
 \text{Constant: } \quad 13
 \end{array}$$

b. $2z^2 + y + 3$

$$\begin{array}{r}
 \underbrace{2z^2} + \underbrace{y} + \underbrace{3} \\
 \text{Terms: } 2z^2, \quad 1y, \quad 3 \\
 \text{Coefficients: } 2, \quad 1 \\
 \text{Constant: } \quad \quad 3
 \end{array}$$

 **On Your Own**

Identify the terms, coefficients, and constants in the expression.

1. $12 + 10c$

2. $15 + 3w + \frac{1}{2}$

3. $z^2 + 9z$

2

Writing Algebraic Expressions Using Exponents

Write each expression using exponents.

a. $d \cdot d \cdot d \cdot d$

Because d is used as a factor 4 times, its exponent is 4.

∴ So, $d \cdot d \cdot d \cdot d = d^4$.

b. $1.5 \cdot h \cdot h \cdot h$

Because h is used as a factor 3 times, its exponent is 3.

∴ So, $1.5 \cdot h \cdot h \cdot h = 1.5h^3$.

● **On Your Own**

Write the expression using exponents.

4. $j \cdot j \cdot j \cdot j \cdot j \cdot j$

$2^2 + 2^2 = 2^4$

$4 \cdot 4$

$16 \rightarrow 16$

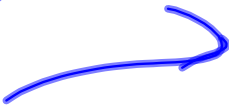
5. $9 \cdot k \cdot k \cdot k \cdot k \cdot k \cdot j \cdot j$

$9k^5 \cdot j^2$

$$2^2 \cdot 2^3 = 2^5$$

$$4 \cdot 8$$

$$32$$



$$32$$

$$\begin{array}{r} 32 \\ \times 16 \\ \hline 192 \\ 320 \\ \hline 512 \end{array}$$

$$2^4 \cdot 2^5 = 2^9$$

$$16 \cdot 32 = 512$$

512

$$\textcircled{512}$$

$$a^2 \cdot a^5$$
$$a^7$$

$$2^4 \cdot 2^5$$

$$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$$

$$2^9$$

$$2^3 \cdot 2^5$$

$$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$$

$$2^9$$

3 Evaluating Algebraic Expressions

- a. Evaluate $k + 10$ when $k = 25$.

$$\begin{aligned} k + 10 &= 25 + 10 && \text{Substitute 25 for } k. \\ &= 35 && \text{Add 25 and 10.} \end{aligned}$$

- b. Evaluate $4 \cdot n$ when $n = 12$.

$$\begin{aligned} 4 \cdot n &= 4 \cdot 12 && \text{Substitute 12 for } n. \\ &= 48 && \text{Multiply 4 and 12.} \end{aligned}$$

 **On Your Own**

6. Evaluate $24 + c$ when $c = 9$.
7. Evaluate $d - 17$ when $d = 30$.

4 Evaluating an Expression with Two Variables

Evaluate $a \div b$ when $a = 16$ and $b = \frac{2}{3}$.

$$a \div b = 16 \div \frac{2}{3}$$

Substitute 16 for a and $\frac{2}{3}$ for b .

$$= \cancel{16} \cdot \frac{3}{\cancel{2}}$$

Multiply by the reciprocal of $\frac{2}{3}$, which is $\frac{3}{2}$.

$$= 24$$

Multiply.

 **On Your Own**

Evaluate the expression when $p = 24$ and $q = 8$.

8. $p \div q = 3$

9. $q + p = 32$

10. $p - q = 16$

11. $pq = 192$

5 Evaluating Expressions with Two Operations

a. Evaluate $3x - 14$ when $x = 5$.

$$\begin{aligned} 3x - 14 &= 3(5) - 14 && \text{Substitute 5 for } x. \\ &= 15 - 14 && \text{Using order of operations, multiply 3 and 5.} \\ &= 1 && \text{Subtract 14 from 15.} \end{aligned}$$

b. Evaluate $z^2 + 8.5$ when $z = 2$.

$$\begin{aligned} z^2 + 8.5 &= 2^2 + 8.5 && \text{Substitute 2 for } z. \\ &= 4 + 8.5 && \text{Using order of operations, evaluate } 2^2. \\ &= 12.5 && \text{Add 4 and 8.5.} \end{aligned}$$

 On Your Own

Evaluate the expression when $y = 6$.

12. $5y + 1$

$$\begin{aligned} 5(6) + 1 \\ 30 + 1 \\ 31 \end{aligned}$$

13. $30 - 24 \div y$

$$\begin{aligned} 30 - 24 \div 6 \\ 30 - \frac{24}{6} \\ 30 - 4 \\ 26 \end{aligned}$$

14. $y^2 - 7$

$$\begin{aligned} 6^2 - 7 \\ 36 - 7 \\ 29 \end{aligned}$$

15. $1.5 + y^2$

$$\begin{aligned} 1.5 + 6^2 \\ 1.5 + 36 \\ 37.5 \end{aligned}$$

Assignment

Do numbers:

1, 9, 17, 21, 26, 32, 35, 47, 53, & 55

on pages 115, 116, & 117 of your
hard cover Big Ideas Text Book.

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Homework

Big Ideas Record and
Pracce Journal

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