

**PART I GET STARTED****Today's Mathematics**

We will identify the parts of an expression and evaluate it by substituting numbers.

**Essential Question**

How can an expression represent a situation and help us find a value?

**DO NOW**

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1.  $8.4 \div 1.2$

2.  $3^2 + 2 \times 4$

3.  $\frac{3}{4} \div \frac{1}{2}$

**SEE IT**

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A school club has \$10 and earns \$3 for each bookmark sold. The expression  $10 + 3b$  represents its money when it sells  $b$  bookmarks. Find the amount when  $b = 4$ . Show the substitution.

**QUICK WRITE — 2 MINUTES**

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What does  $b$  represent? Why does  $3b$  mean multiply?

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**PART II INVESTIGATE****CHANGE THE INPUT**

Work with a partner. A club's money is represented by  $10 + 3b$ , where  $b$  is the number of bookmarks sold. Complete each row.

| Bookmark count, $b$ | Substitute into $10 + 3b$ | Money (dollars) |
|---------------------|---------------------------|-----------------|
| 0                   |                           |                 |
| 1                   |                           |                 |
| 2                   |                           |                 |
| 5                   |                           |                 |

1. What changes each time one more bookmark is sold? Explain.

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2. Circle the number that stays the same in  $10 + 3b$ . What does it represent?

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3. A student substitutes  $b = 5$  and writes  $10 + 35 = 45$ . Explain the error and find the correct amount.

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**PART III MAKE SENSE AND PRACTICE****WHAT WE CAN CONCLUDE**

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An **algebraic expression** contains numbers, operations, and variables. A **variable** represents a number. **Terms** are the parts added or subtracted. A **coefficient** is a numerical factor of a variable term. A **constant** is a term without a variable.

In  $5x + 9$ , the terms are  $5x$  and  $9$ , the coefficient is  $5$ , and the constant is  $9$ . A variable alone has coefficient  $1$ .

Repeated factors use exponents:  $x \cdot x \cdot x = x^3$ , while  $4x$  means  $4 \times x$ .

**WORKED MODEL**

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Evaluate  $2x^2 + 3$  when  $x = 4$ :  $2(4)^2 + 3 = 2(16) + 3 = 35$ .  
Substitute first. Then use the order of operations.

**MUST DO**

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1. Identify the terms, coefficients, and constant in  $3a^2 + b + 7$ .
2. Write  $5 \cdot y \cdot y \cdot y$  using an exponent.
3. Evaluate  $4m + 6$  when  $m = 3$ .
4. Evaluate  $\frac{a}{b} + 2$  when  $a = 12$  and  $b = \frac{1}{2}$ .
5. A plant's height is  $8 + 2w$  centimeters after  $w$  weeks. Find its height after 6 weeks.

**READY FOR MORE**

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When  $n = 3$ , which is greater:  $2n$  or  $n^2$ ? Would your answer be the same when  $n = 1$ ? Show why.

## PART IV PUZZLE PRACTICE

### Homework — Crack the code

Evaluate each expression when  $x = 3$  and  $y = 2$ . Show your work in the table. Match each result to a letter in the bank. Write the letters in problem order to reveal a math message.

| No. | Expression  | Work and value |
|-----|-------------|----------------|
| 1   | $x + y$     |                |
| 2   | $4x$        |                |
| 3   | $x^2 + 1$   |                |
| 4   | $xy + 3$    |                |
| 5   | $x^2 - y$   |                |
| 6   | $18 \div x$ |                |
| 7   | $2x^2$      |                |
| 8   | $y^3$       |                |

### LETTER BANK

|      |       |             |       |
|------|-------|-------------|-------|
| K: 7 | H: 12 | G: 8        | T: 5  |
| B: 6 | N: 9  | I: 18 or 10 | C: 11 |

### DECODE

|   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
|   |   |   |   |   |   |   |   |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

Add a space after letter 5. What is the message?