

# Bell Ringer: WHITEBOARDS READY!



**REVIEW:**

Evaluate  $12 + 8 - 5$ .



**INTRO:**

Write  $3 + x$ : what could  $x$  be?



**CHALLENGE PREVIEW:**

If  $n + 5 = 12$ , what is  $n$ ?





# Algebra 1 - Unit 1: Lesson 1 - What Is a Variable?

## TODAY'S STANDARDS:

- ☑ 9.3.5.7 equivalent algebraic expressions
- ☑ 9.3.5.8 equivalent forms



MERIT EDUCATION  
GROUP





# I Can Statements

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- ★ I can identify variables.
- ★ I can write equivalent expressions.
- ★ I can explain variables in real-world contexts.





# Success Criteria

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**1. Identify variables correctly.**

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**2. Write equivalent forms.**

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**3. Explain unknown quantities.**





# Vocabulary



**Variable:** a symbol for an unknown quantity.



**Expression:** a mathematical phrase.



**Constant:** a fixed number.



**Coefficient:** a multiplier of a variable.



— EXAMPLE: —

$$5x + 3$$

↑      ↑      ↑  
coefficient   variable   constant

expression

## • COLOR KEY •

- Variable
- Expression
- Constant
- Coefficient





# Career Spotlight: Sarah Chen, Medical Lab Scientist

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## *Where Careers Meet Algebra*

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**Degree: BS Medical  
Laboratory Science**

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**Salary: \$74,240/yr**  
(25th percentile, MN DEED OES 2025)

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**SOC code: 29-2011**

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**Uses variables in  
her work.**

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**Mayo Clinic,  
Rochester MN**



**MAYO CLINIC**



**YOUR TURN.**

**How do variables help  
Sarah solve problems  
in the lab?**



# Word Problem: Solve Like a Pro!



## PROBLEM:

Sarah Chen volunteers with a Rochester community garden. The garden charges a flat registration fee of \$12 and \$4 per plot rented.

Write an expression for the total cost if  $p$  plots are rented.



## READING STRATEGY:

 **CIRCLE** → **UNDERLINE** → **BOX** → **WRITE**



## SOLUTION:

$$12 + 4p$$



## CHECK WITH AN EXAMPLE:

$$12 + 4(3) = \$24$$



# Culture Slide: Ojibwe Spotlight

- ★ The Ojibwe people use birch bark and tradition to create beautiful, durable baskets.
- ★ Weaving patterns build upward one tier at a time.
- ★ Math helps us model and understand these patterns.



## MATH CONNECTION

Birch-bark basket weaving:

8 base reeds +  $r$  per tier →

$$8 + r$$

$r$  shows how materials scale with design.



Ojibwe Flag:  
Blue for the waters and skies. White for peace. Green for the land.





# Direct Instruction: Key Terms

$x$

**VARIABLE:** letter for an unknown value.

$3x+5$

**EXPRESSION:** math phrase without equals sign.

7

**CONSTANT:** fixed value.

$5x$

**COEFFICIENT:** multiplier, implicit 1.



SEE IT IN  
ACTION!

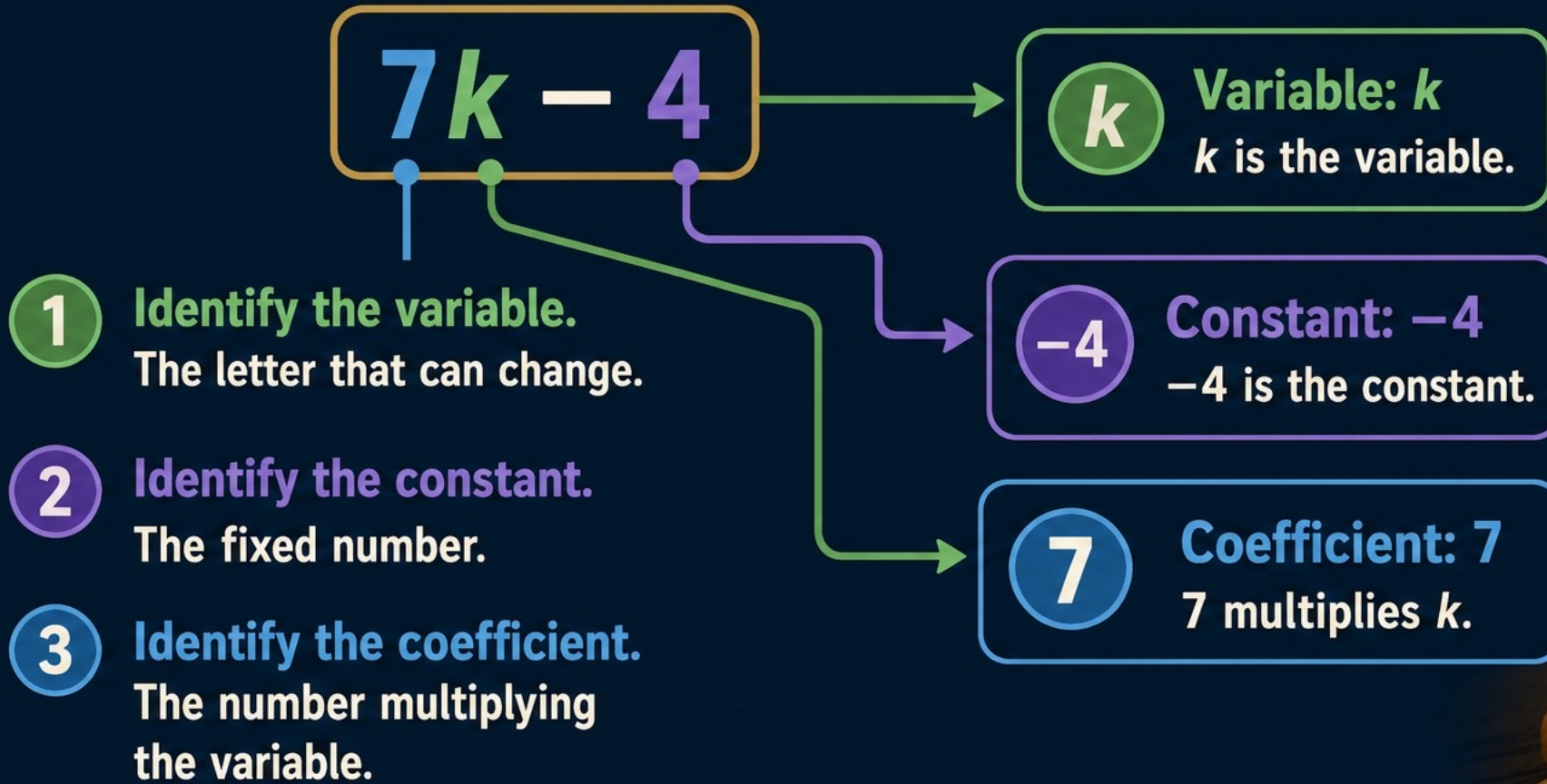
EXAMPLE:  $5x + 3$   
coefficient   variable   constant





# Worked Example: Parts of $7k - 4$

Break the expression into its parts.



☆ In Summary: Coefficient 7 | Variable  $k$  | Constant  $-4$





# Go Practice

Write an expression for:

*'5 less than three times a number.'*

Answer:


$$3n - 5.$$





# Go Answer

The expression is:  $3n - 5$

## Step-by-Step:

- $\times 3$  ① Three times a number.  
• Three times a number =  $3n$ .
- $-5$  ② Five less than that.  
• Subtract 5 from  $3n$ .
-  ③ Write the final expression.  
• Five less than  $3n = 3n - 5$ .

Three times  
a number

$$= 3n$$

Five less  
than that

$$3n - 5$$





# Set Practice

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1 Identify the variable, constant, and coefficient in  $7k - 4$ .

• Variable: \_\_\_\_\_

• Constant: \_\_\_\_\_

• Coefficient: \_\_\_\_\_

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2 A community garden charges a flat fee of \$12 and \$4 per plot rented. If  $p$  plots are rented, write an expression for the total cost.

Expression: \_\_\_\_\_





# SET ANSWERS

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- ① In the expression  $7k - 4$ :
- **Variable:**  $k$  (represents an unknown value).
  - **Constant:**  $-4$  (a fixed value).
  - **Coefficient:**  $7$  (the multiplier of  $k$ ).
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- ② Expression for total cost:  $12 + 4p$

Check with  $p = 3$ :

$$12 + 4(3) = 12 + 12 = 24$$

*Total cost = \$24*





# Extra Practice Challenge



## CHALLENGE:

Does  $2(x + 3)$  equal  $2x + 6$  when  $x = 4$ ?



## SHOW YOUR WORK:

Left Side:

$$\begin{aligned} &2(x + 3) \\ &= 2(4 + 3) \\ &= 2(7) \\ &= 14 \end{aligned}$$

Right Side:

$$\begin{aligned} &2x + 6 \\ &= 2(4) + 6 \\ &= 8 + 6 \\ &= 14 \end{aligned}$$



$14 = 14 \rightarrow$  **YES**, they are **EQUIVALENT**.





# Extra Practice Answers



$$2(4 + 3) = 2(7) = 14.$$



$$2(4) + 6 = 8 + 6 = 14.$$



Therefore, expressions  
are **equivalent**.



**14 = 14**, yes equivalent.





# Game Introduction:

## Prime Time Game - Translation Match

### ★ HOW TO PLAY ★



Teacher shows a verbal phrase or expression card.



Teams write the matching algebraic expression on their whiteboards.



On the cue, teams hold up boards for checking.



Teacher confirms answers and explains the match.



All teams learn and discuss together after each round.



**TEAMS: 4 TO 6 TEAMS**

★ ZERO DEVICES. WHOLE CLASS. ALL IN! ★

### EXAMPLE OF A MATCH

| VERBAL PHRASE                        | ALGEBRAIC EXPRESSION |
|--------------------------------------|----------------------|
| Seven more than three times a number | $3n + 7$             |



### KEY REMINDERS

Expressions only: no equals signs.

- Use one variable letter.
- Show your best work on boards.
- Be ready, be loud, be respectful!





# Game Play



## SOLVE TOGETHER.

Work as a team to solve each translation.



## COMPETE & GROW.

Challenge other teams to get every answer right!



## ENGAGE & PARTICIPATE.

Stay focused, share ideas, and support your team!

★ Translation Match: Write an algebraic expression.  
Let  $x$  represent the number.

1. Three more than a number.

2. Twice a number decreased by 5.

3. Seven less than a number.

4. Four times a number.

5. A number divided by 3.

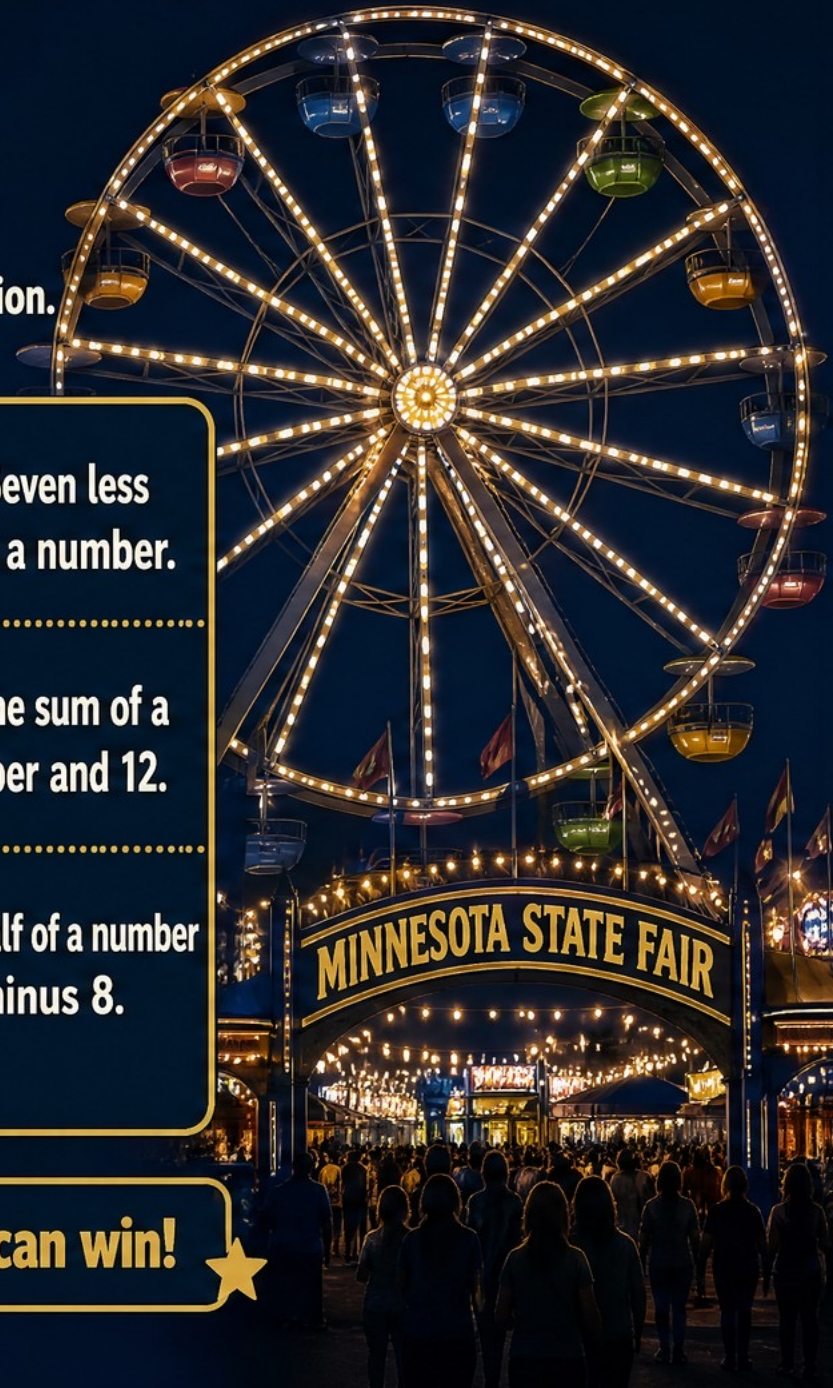
6. The sum of a number and 12.

7. Nine less than twice a number.

8. Five times a number plus 7.

9. Half of a number minus 8.

★ Every voice matters. Every team can win! ★





# Game Wrap-Up



## REVIEW CORRECT ANSWERS

- Go through each problem from the game.
- Reveal the correct answers.
- Clarify any questions or confusion.



## DISCUSS STRATEGIES USED

- Which strategies helped your team most?
- What made problems easier or harder?
- What will you try next time?





# Engagement: Think-Pair-Share

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**THINK:**  
Students think individually.



**PAIR:**  
Pair up to discuss.



**SHARE:**  
Share findings with class.





# Summary: Key Takeaways



## 1. VARIABLES REPRESENT THE UNKNOWN.

We use letters like  $x$  or  $n$  to stand for any value.



## 2. EXPRESSIONS SHOW RELATIONSHIPS.

They combine numbers, variables, and operations without an equals sign.



## 3. ALGEBRA CONNECTS TO REAL LIFE.

Variables help model situations and solve problems in everyday contexts.





# Exit Ticket Instructions



Go to your LMS → Complete the Exit Ticket.

①

Define a **variable** in your own words.

②

Expression for: “Twice a number decreased by 9.”

$n$  = the number.



Show your work for full credit.





# Today and Tomorrow



## WHAT WE LEARNED TODAY:

- Identified variables in expressions.
- Wrote and interpreted equivalent expressions.
- Connected variables to real-world situations.



## UP NEXT:

→ **Translating Verbal Phrases**

