

Important Concepts . . .

Preview Review



Mathematics Grade 7
W2 - Lesson 2: Expressions and
Modeling Equations

Important Concepts of Grade 7 Mathematics

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W1 - Lesson 2	Decimal Numbers
W1 - Lesson 3	Fractions
W1 - Lesson 4	Improper Fractions, Mixed Numbers, Percents, and Decimals
W1 - Lesson 5	Integers, Number Lines, and Sequencing
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W2 - Lesson 4	Statistics
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W3 - Lesson 3	Line Segments
W3 - Lesson 4	Parts and Plotting on a Cartesian Plane
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W3 - Quiz	

Materials Required

Math Set
Calculator

**No Textbook
Required**

**This is a stand-
alone course.**

Mathematics Grade 7

Version 6

Preview/Review W2 - Lesson 2

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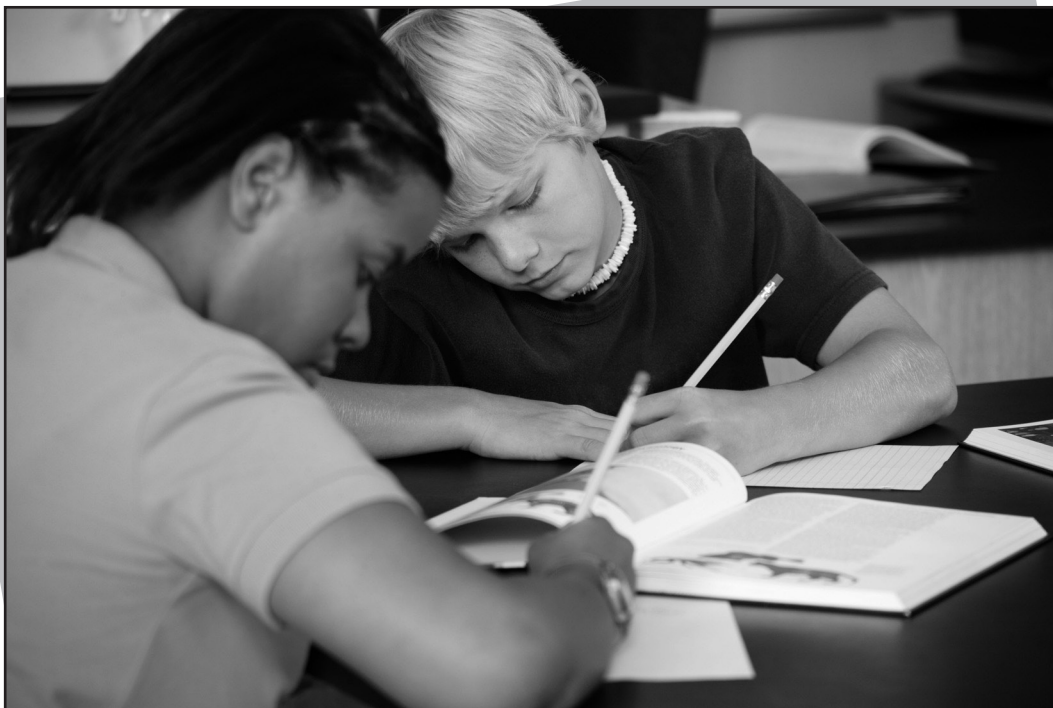
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Preview/Review Concepts for Grade Seven Mathematics



W2 – Lesson 2:

***Expressions and Modeling
Equations***

W2 – Lesson 2: Expressions and Modeling Equations

Objective:

- I can identify the parts of an algebraic expression.*

Term: variables or constants separated by a plus or minus sign.

Example, $4x - 6$ (has 2 terms)

Variable: a letter or symbol used to represent any number you want.

Example, $x + 3$ (means 3 more than any number). x is the variable

Constant term: the term in the expression that has a fixed value and does not contain variables.

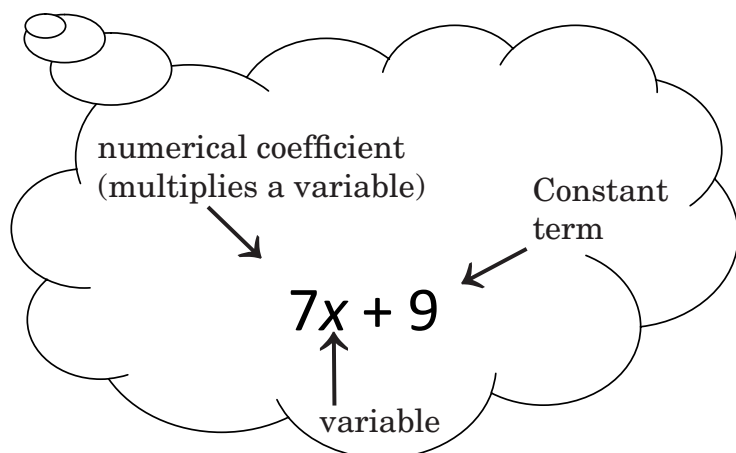
Example, $x - 9$ (9 is the constant term)

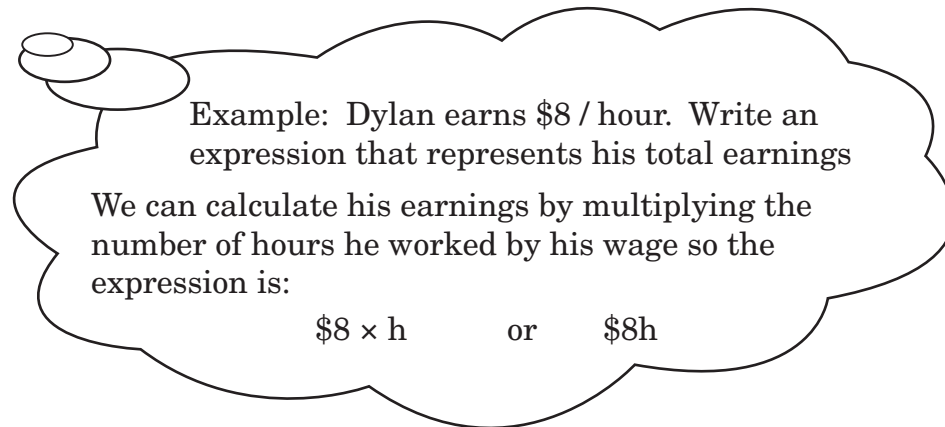
Algebraic expression: is a math “sentence” containing algebraic terms that can be reused to solve similar problems even if the numbers change. It can include variables or constants but **does not** have an equal sign

Practice

Circle any numerical coefficients and **underline** any constant terms.

- a. $4x - 2$
- b. $5 + 3n$
- c. $23w + 45$
- d. $12d - 6b$
- e. $3g - 4h + 15$



Writing Expressions:**Practice:**

Using **n** as the variable, write an expression for:

- a. Five times a number
- b. Nine minus a number.
- c. A number subtracted from eight.
- d. A number decreased by two
- e. Twelve more than three times a number.
- f. Six less than a number divided by two.
- g. A number plus one then divided by three
- h. A number plus four, times ten.
- i. Ronald buys CDs at \$12 each. Write the expression for the price of n CDs.

Objective:

- *I can evaluate an expression by using substitution.*

Evaluating expressions:

An expression can be evaluated, or solved, by substituting, or replacing, the variable with a number.

Use brackets () to indicate which numbers are the substituted values.

Example 1: Evaluate the expression $7g - 4$ for $g = 2$.

$$7(2) - 4$$

$$= 14 - 4$$

$$= 10$$

Example 2:

Cory delivers flyers for his dad. His dad gives him \$5/h plus \$1 for every 100 flyers he delivers. The expression representing his earnings is $5h + n$ where h is number of hours, and n is the number of 100 flyers. If Cory spent 2 hours delivering 300 flyers, how much money did he earn?

$$5h + n$$

$$= 5(2) + (3)$$

$$= 10 + 3$$

$$= \$13$$

He earned \$13.

Practice:

1. Evaluate the expression

a. $6a + b$ for $a = 3$ and $b = 1$

b. $7(a-1) + b$ for $b = 7$ and $a = 5$.

c. $3b-(a + 5)$ for $a = 6$ and $b = 10$

d. $3(b - 1) + a$ for $a = 1$ and $b = 5$.

2. A movie costs \$6.00 per adult and \$4 per child to attend.

a. What expression would represent the cost for the movie?

b. How much would the total cost be if 3 adults and 7 children went?

3. Lorraine is renting a tent and chairs for a birthday party. The tent costs \$250.00 for the day plus \$3.00 for each chair.

a. What algebraic expression would describe the cost of renting a tent and chairs for the day?

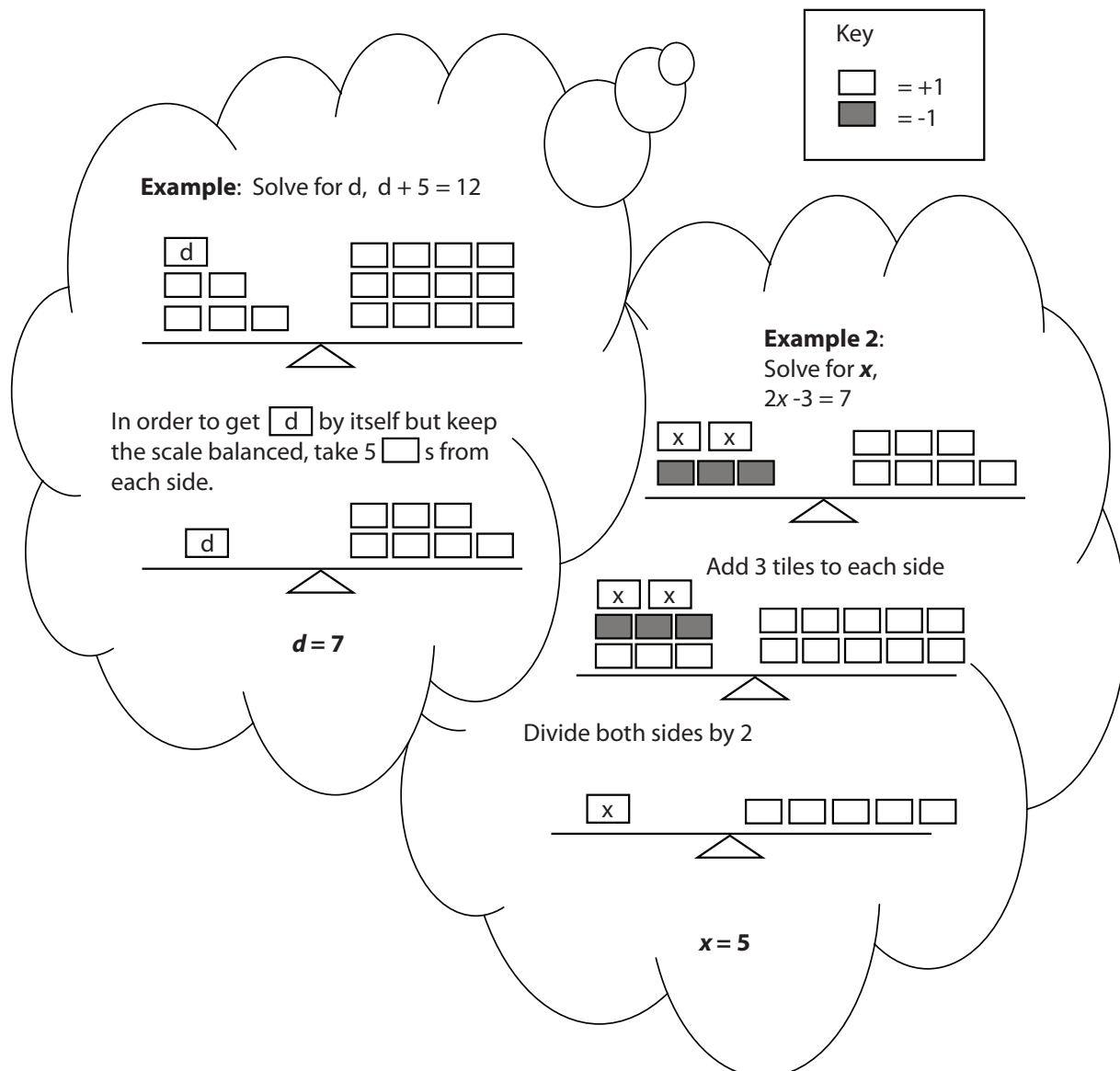
b. What is the cost of renting the tent and 26 chairs for the day?

Objective:

- I can model the preservation of equality.*

Equation: one quantity equal to another quantity. Each quantity may be a number or an algebraic expression.

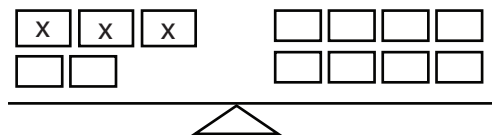
Example: $8b + 4 = 16$

Balance Scale model:

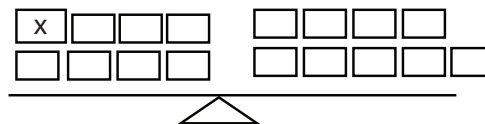
Practice:

Model the solution for the variable using a balance scale model

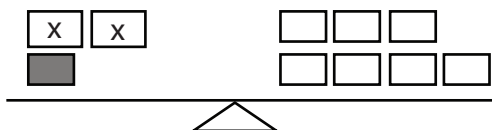
a. $3x + 2 = 8$



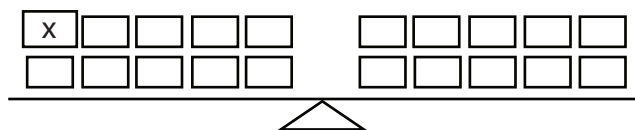
b. $x + 7 = 9$



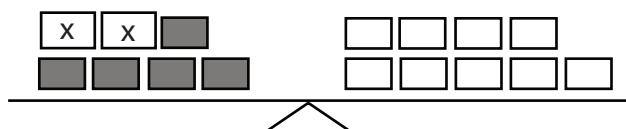
c. $2x - 1 = 7$



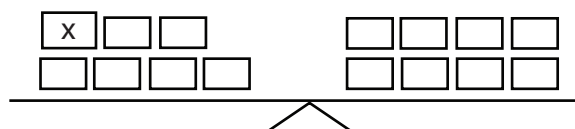
d. $x + 9 = 10$



e. $2x - 5 = 9$



f. $x + 6 = 8$



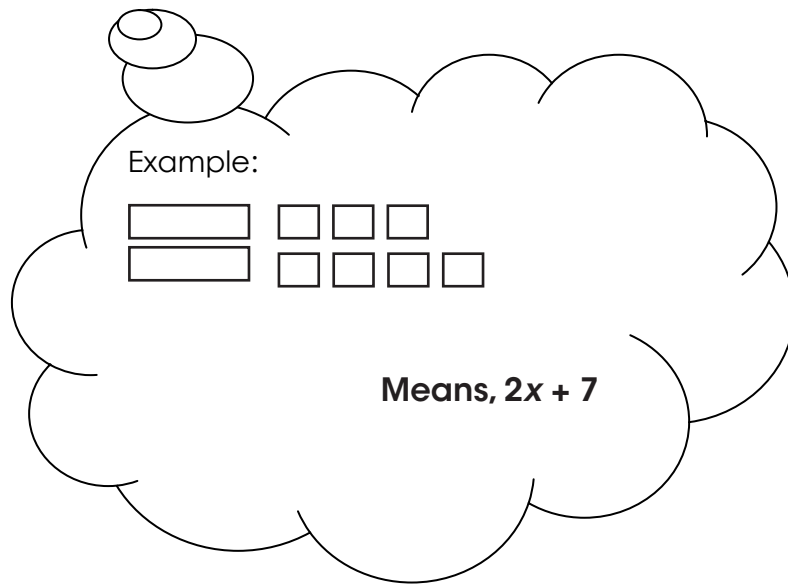
Unit tile: represented by a single tile.

Each one tile represents.

$\square = +1$ $\blacksquare = -1$

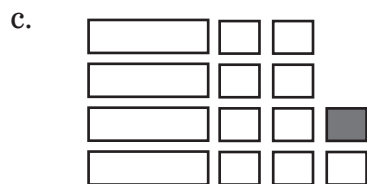
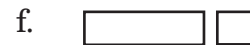
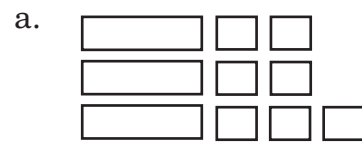
Remember: $\square \blacksquare = 0$

Variable tile: represented by a long rectangular tile. Each tile represents one unit of a variable.



Practice:

What expression is represented?



Model integer equations using algebra tiles:

Example:

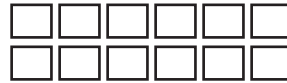
□ open tiles are positive
■ shaded tiles are negative

$$h - 5 = 12$$

Left side: $(h - 5)$



Right side (12)



→ To take away tiles we need to make “zero pairs”

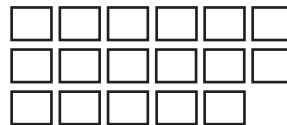
→ Whatever happens to one side must also happen to the other side to keep it equal

In this case, to get the variable by itself, add 5 positive tiles to both sides.

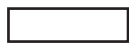
Left side:



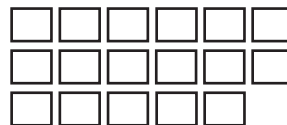
Right side



Left side:



Right side



Therefore, $h = 17$

Practice:

Model and solve the equation using Algebra tiles

a. $x - 7 = -3$

Left side:

Right side



b. $x - 8 = 1$

Left side:

Right side



c. $x - 3 = 4$

Left side:

Right side



Summary and Practice:

- *Using what you've learned, answer the following questions.*

1. Compare expressions and equations. What is similar? What is different?

Expressions and Equations	
Similarities	Differences

2. Circle all numerical coefficients. Underline constant terms.

a. $4b + 5c - 12$

b. $3x - 8y + 3z - 34$

c. $7g + 2h + 25$

d. $6m - 9n$

3. Write an expression for each phrase:

- a. Seven more than a number.
- b. A number multiplied by five.
- c. A number decreased by twelve.
- d. A number divided by four.
- e. Double a number and add three.
- f. A number is subtracted from thirty two

4. Jillian makes \$6 an hour babysitting.

- a. Write an expression to represent her earnings.
- b. How much does Jillian make if she babysits for 4 hours?
- c. 6 hours?

5. Marg's flower shop sells roses for \$2 a stem, lilies for \$1, and orchids for \$3. If the customer wants a vase, it is an additional \$10.
- a. Write an expression that would represent her total price for an arrangement with each flower type in a vase.
- b. How much would Marg charge if a customer orders:
- i. 12 roses and 3 orchids with a vase?
- ii. 5 roses, 7 lilies, and 2 orchids, no vase?
- iii. 12 roses, 2 lilies, 2 orchids with a vase?
6. Evaluate the expression.
- a. $8a + b$ for $a = 2$ and $b = 4$.
- b. $3(a - 2) + b$ for $b = 8$ and $a = 5$.

7. Model the equation and the solution using a balance scale model.

a. $2x - 2 = 10$

b. $3x + 3 = 12$

8. Model and solve the equation using Algebra tiles

a. $x - 2 = -3$

Left side:



Right side

b. $2x + 2 = 6$

Left side:



Right side



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