Name:_____ Date:_____

Completed Notes
Algebra Section 1.1
Pages 2-7

Goal: "I will evaluate an expression given a value for the variable with exponents"
"I will write an expression to represent a situation"

Vocabulary:

Variable: A variable is a letter used to represent one or more numbers.

Expression: A number sentence consisting of numbers, variables, and operations.

What is the difference between an algebraic expression and an algebraic equation?

An algebraic equation has an equals sign and an expression does not.

Expressions

Examples of expressions: $6x$ $3x+8$ $9n-5$

Do not use x for multiplication anymore.

Do not use ÷ for division anymore.

Expression	Meaning	Operation
$3x$	3 times the value of x	multiplication
$\frac{12}{x}$	Divide 12 by the value of x	division

Evaluating expressions:

1) Write down the expression (ex: 3x+2)
2) Input the values (ex: x=5)
3) Simplify using Order of Operations (PEMDAS)

Example:

Evaluate $3x+5$ for $x=10$

1) Copy the expression $3\boldsymbol{x} + 5$
2) Input the values $3 \cdot \mathbf{10} + 5$
3) Simplify using order of operations (PEMDAS) $30 + 5$
35

Try These:

Evaluate the expressions below when n=5

(a) $3 + n$

Input: $3 + 5$

Simplify: 8

(b) $10n$

Input: $10 \cdot 5$

Simplify: 50

(c) $\frac{15}{n}$

Input: $\frac{15}{5}$

Simplify: 3

(d) $n - 1$

Input: $5 - 1$

Simplify: 4

Evaluate the expressions below when $y = 2$.

(a) $6y-3$

Input: $6 \cdot 2 - 3$

Simplify: $12 - 3$
9

(b) $y + 4$

Input: $2 + 4$

Simplify: 6

(c) $11 - 2y$

Input: $11 - 2 \cdot 2$

Simplify: $11 - 4$
7

Writing an expression:

Example:

Timmy is going to the movies with his friends. Each movie ticket costs $12. How much will it cost for all of them to see the movie?

What is varying or unknown? The number of friends going to the movies.

Pretend that you were going to the movies with your friends. Describe how you would find the total cost for the tickets. I would multiply the number of tickets bought by $12.

Write an expression for the total cost of the outing. Use a variable for the unknown.

$12n$

What does the variable stand for? The number of tickets purchased.

Try These:

Veronica is going to the movies. She is buying a movie ticket for $12 and a box of popcorn. How much will it cost her to go to the movies?

What is varying or unknown? The cost of one box of popcorn.

Pretend that you were going to the movies. Describe how you would find the total cost for the ticket and box of popcorn. I would add the cost of the popcorn and the cost of the ticket.

Write an expression for the total cost of the outing. Use a variable for the unknown.

$12+n$

What does the variable stand for? The cost of a box of popcorn.

Bobby is going to the movies. He buys a box of popcorn with a $20 bill. How much change will he receive?

What is varying or unknown? The cost of a box of popcorn

Pretend that you were going to the movies. Describe how you would find the change for a $20 bill. Subtract the cost of the box of popcorn from 20.

Write an expression for the total cost of the outing. Use a variable for the unknown.

$20 - n$

What does the variable stand for? The cost of a box of popcorn.

Challenge:

Sally is going to the movies with her friends. She is buying one box of popcorn for $9 and movie tickets for each person costing $12 each. Write an expression to show the total amount spent.

What is varying or unknown? The number of friends going to the movies.

Pretend that you were going to the movies with your friends. Describe how you would find the total cost for the outing. I would multiply 12 by the number of tickets bought. Then I would add 9 for the box of popcorn.

Write an expression for the total cost of the outing. Use a variable for the unknown.

$12n + 9$

What does the variable stand for? The number of movie tickets purchased.

Exponents

Power: An expression that represents repeated multiplication of the same factor.

In the expression 2^5, what number is the base? 2

Which number is the exponent? 5

Note: $4^0=1$ (Anything to the 0 power=1)

Example: 4^3

Expand $4 \cdot 4 \cdot 4$

Simplify $16 \cdot 4$

64

Try These:

(a) 5^3

Expand $5 \cdot 5 \cdot 5$

Simplify $25 \cdot 5$

125

(b) $(7)^2$

Expand $7 \cdot 7$

Simplify 49

(c) 3^2

Expand $3 \cdot 3$

Simplify 9

(d) 2^4

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

Simplify $4 \cdot 2 \cdot 2$

$8 \cdot 2$

16

Challenge:

Input the value first then Simplify.

(a) x^3 $x=4$

4^3

$4 \cdot 4 \cdot 4$

$16 \cdot 4$

64

(b) k^2 $k = 5$

5^2

$5 \cdot 5$

25

(c) d^3 $d = 3$

3^3

$3 \cdot 3 \cdot 3$

$9 \cdot 3$

27