

Grade 7 Mathematics  
Week of December 7 – December 11

**Lesson 3.1 Equations**  
**Lesson 3.2 Variables**  
**Lesson 3.3 Substitution**

**Lesson Materials**

- Lessons for Section [3.1 Equations](#)
- Lessons for Section [3.2 Variables](#)
- Lessons for Section [3.3 Substitution](#)
- Equations Learning Guide (This PDF)

Use the link above to open the lessons for this section. Remember: on the lesson page, use the arrow next to the “Table of Contents” at the **top of the page** to move through the lessons. You can also click on the Table of Contents to open the menu so you can jump to a specific lesson page.


☰ G4T > Modules > Mathematics > 1.1 Place Value

Home

WCLN.ca Introduction to Numbers

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Numbers are all around us. They serve very different purposes depending on how they are used. A number is a mathematical object used to count, measure or label.

Count	Measure	Label
–	centimeter    decimeter	

Work through the online lessons. You can work at your own pace or follow the suggested schedule below. Complete the activities in your Learning Guide as you work through the lessons. You can print the Learning Guide, or, copy out the questions on a separate piece of paper. Be sure to try the games and practice quizzes as you make your way through the online lesson book.

**Suggested Lesson Schedule**

<p><b>Monday</b></p> <ul style="list-style-type: none"><li>• 3.1 – What is an equation?</li><li>• Equation or Not</li><li>• Balance Scale Puzzles</li><li>• Practice</li><li>• LG 3.1 #1-4, p. 1-2</li></ul>	<p><b>Wednesday</b></p> <ul style="list-style-type: none"><li>• 3.2 – Creating Equations</li><li>• Matching Terms</li><li>• Practice</li><li>• Challenge Yourself</li><li>• LG 3.2 #3, p. 3-4</li></ul>
<p><b>Tuesday</b></p> <ul style="list-style-type: none"><li>• 3.2 – What is a Variable?</li><li>• Variables</li><li>• Terms</li><li>• LG 3.2 #1-2, p. 3</li></ul>	<p><b>Thursday</b></p> <ul style="list-style-type: none"><li>• 3.3 – Evaluation</li><li>• Practice</li><li>• Applications</li><li>• Challenge Yourself</li><li>• LG 3.3 #1-2, p. 5</li></ul> <p><b>Friday</b></p> <ul style="list-style-type: none"><li>• LG 3.3 #3-10, p. 5-8</li></ul>

Name: \_\_\_\_\_

## UNIT 3 LEARNING GUIDE – EQUATIONS

## INSTRUCTIONS:

Using a pencil, complete the following questions as you work through the related lessons. Show ALL of your work as is explained in the lessons. Do your best and always ask questions if there is anything that you don't understand.

### 3.1 EQUATIONS

- An equation always contains an \_\_\_\_\_ sign.
- Circle all of the equations in the examples below.

$15 - y = 3$

$1300 - 450$

$x \geq 75$

$4\ 970\ 201$

$0 < 67 + 2$

$18 \div m = 9 - n$

$22 + 7 + 3 = 31$

$d - t = s$

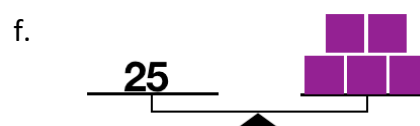
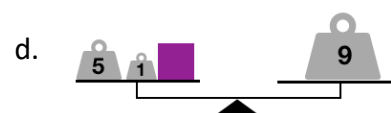
$10 = t + \frac{1}{3} - 25$

$6 \div 3 + 8 \times 2$

$6 + 5 = 9 - 2 + 4$

$xy > ab$

- Determine the value of one square in each example.



4. Find the missing value. *Reminder: Both sides must be equal.*

Ex.  $\boxed{5} + \boxed{3}$        $\boxed{9} - \boxed{2}$

c.  $\boxed{5} \times \boxed{2}$        $\boxed{2} + \boxed{\phantom{0}}$

a.  $\boxed{4} + \boxed{1}$        $\boxed{8} - \boxed{\phantom{0}}$

d.  $\boxed{10} \times \boxed{3}$        $\boxed{\phantom{0}} - \boxed{5}$

b.  $\boxed{2} + \boxed{\phantom{0}}$        $\boxed{6} - \boxed{3}$

e.  $\boxed{11} + \boxed{7}$        $\boxed{2} \times \boxed{\phantom{0}}$

3.2 VARIABLES
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1. Write an equation to match the sentence. You do not need to solve the equation.  
*Reminder: Use a variable to represent the unknown number. A variable can be any letter.*

Ex. Five times a number is 40

$$5y = 40$$

a. Six plus a number is 16

b. A number minus four is 11.

c. A number times seven is 77.

d. Thirty divided by a number is 15.

e. Sixty plus twelve is a number.

2. Fill in the table. Use the terminology *sum*, *difference*, *product* and *quotient*.

	Word Sentence	Equation
Ex.	<i>The sum of 5 and a number is 20.</i>	$5 + n = 20$
a.		$10 + x = 30$
b.		$10 - y = 9$
c.		$d \times 2 = 12$
d.		$15 \div z = 3$
e.		$25 - h = 4$

3. Write an equation to represent each mathematical problem. You do not have to solve the problem. *Reminder: One of the terms of your equation will be a variable. You can use any letter to represent that unknown value.*

a. Lee had \$400 in his bank account. After withdrawing some money, he had \$342.

$$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

b. There were 27 people on a bus. At the next stop, a certain number got on the bus and then there were 35 people on the bus.

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

c. A grandmother divided some apples into 5 groups. Each group contained 8 apples.

$$\underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

- d. Adelaide purchased several packs of chewing gum. Each pack cost 2 dollars and she paid a total of 14 dollars.

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

3.3 SUBSTITUTION 2
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1. Follow the steps in order to evaluate each expression.

**Ex.**

	$x + 4$ if $x =$
	5
Step 1	$( \quad ) + 4$
Step 2	$(5) + 4$
Step 3	9

b.

	$3y$ if $y = 7$
Step 1	_____
Step 2	_____
Step 3	_____

a.

	$x - 2$ if $x =$
	9
Step 1	_____
Step 2	_____
Step 3	_____

c.

	$r \div 6$ if $r =$
	24
Step 1	_____
Step 2	_____
Step 3	_____

2. Evaluate each expression. *Reminder: Use the same steps as you did in #1.*

a.  $14 + t$  if  $t = 28$

e.  $4 + t$  if  $t = -8$

b.  $45 \div s$  if  $s = 9$

f.  $30 \div s$  if  $s = -3$

c.  $90 - x$  if  $x = 38$

g.  $50 - x$  if  $x = -24$

d.  $11n$  if  $n = 5$

h.  $-9n$  if  $n = -4$

3. Fill in the charts below. *Reminder:* You can remove the  $\times$  symbol between a number and a variable and it still means multiplication.

a. Evaluate  $p + 5$

If $p = 3$ , the sum is	<b>8</b>
If $p = 9$ , the sum is	
If $p = 17$ , the sum is	
If $p = 0$ , the sum is	
If $p = 99$ , the sum is	

b. Evaluate  $8y$

If $y = 2$ , the product is	<b>16</b>
If $y = 10$ , the product is	
If $y = 8$ , the product is	
If $y = 25$ , the product is	
If $y = 4$ , the product is	

c. Evaluate  $\frac{d+5}{2}$

If $d = -1$	<b>2</b>
If $d = -9$	
If $d = 17$	
If $d = -21$	

d. Evaluate  $-3n + 10$

If $n = -8$	<b>34</b>
If $n = 4$	
If $n = -11$	
If $n = 11$	

4. Wu gets paid \$15 for each time that he clears the snow from his neighbour's driveway.
- a. Write an expression for this situation. *Reminder:* An **expression** does not contain an equal sign. You will need to use a variable.

\_\_\_\_\_  $\times$  \_\_\_\_\_

- b. Solve the expression if Wu clears the driveway 6 times.

5. Ryan withdraws (takes out) \$60 from his bank account.
- Write an expression for this situation.
  - Solve the expression if Ryan started with \$200 in the bank.
6. Some hockey players divide 120 cookies into smaller groups for a bake sale.
- Write an expression for this situation.
  - Solve the expression if the hockey players divide the cookies into 10 groups.
7. Choose the correct equation that relates to the word problem, then solve.
- Logan has 4 cm of hair cut off at the hair salon. If  $b$  is the length of hair before getting it cut and  $a$  is the length of hair after getting it cut, which equation would you use to show the length of Logan's hair after getting it cut? *Hint: Begin by rewording the problem in your own words: What are you trying to figure out? What information do you have?*
    - $4 - a = b$
    - $b + 4 = a$
    - $b - 4 = a$
  - Solve for  $a$  if Logan's hair was 11 cm long before getting it cut.
8. Evaluate.
- Ex.  $x - y$  if  $x = 16, y = 9$
- $$\begin{array}{r} ( \quad ) - ( \quad ) \\ (16) - (9) \\ \quad \quad \quad 7 \end{array}$$
- $w + s + s$  if  $w = 7, s =$
  - $bh$  if  $b = 15, h = 3$
  - $\frac{n}{m}$  if  $n = 42, m = 6$



9. Fill in the charts below.

a.

Evaluate $f - 6g$	
If $f = 10$ and $g = 1$	<b>4</b>
If $f = 33$ and $g = -2$	
If $f = -5$ and $g = 5$	
If $f = -42$ and $g = -7$	

b.

Evaluate $\frac{18}{m} + p$	
If $m = 3$ and $p = 1$	<b>7</b>
If $m = -2$ and $p = 9$	
If $m = 6$ and $p = -1$	
If $m = -9$ and $p = -5$	

10. The following equation can be used to approximate the temperature in degrees Celsius

from degrees Fahrenheit:  $C = \frac{F-30}{2}$

- Determine the approximate temperature in degrees Celsius when the temperature is  $26^{\circ}F$ .
- Determine the approximate temperature in degrees Celsius when the temperature is  $-4^{\circ}F$ .
- Determine the approximate temperature in degrees Celsius when the temperature is  $-32^{\circ}F$ .