Evaluating Expressions – A Co-Teaching Lesson Plan

Co-Teaching Approaches
A "(Y)" in front of the following list items indicates the approach is outlined in the lesson. An "(N)" in front of the following list items indicates the approach is not outlined in the lesson.

- (Y) Parallel Teaching
- (Y) Team Teaching
- (N) Station Teaching
- (N) One Teach/One Observe
- (N) Alternative Teaching
- (Y) One Teach/One Assist

Subject
Grade 7 Mathematics

Strand
Patterns, Functions, and Algebra

Topic
Evaluating expressions with given replacement values using manipulatives

SOL
7.11   The student will evaluate algebraic expressions for given replacement values of the variables.

Outcomes
Using concrete materials to represent algebraic expressions to build understanding of the concept.

Materials
- Snack-size bags of colored candies (M&M's or Skittles work best) or number cubes
- Bingo game cards & call sheet
- Calculators
- Evaluating Expressions Notes (attached)
- Evaluating Expressions Notes (completed) (attached)
- Evaluating Expressions with Candy activity (attached)
- Real Life Mathematics handout (attached)

- Real Life Mathematics activity (completed) (attached)
- Evaluating Expressions Practice sheet

Vocabulary
algebraic expression, constant, numerical expression, operation, term, variable

Co-Teacher Actions

Lesson Component	Co-Teaching Approach(es)	General Educator (GE)	Special Educator (SE)
Anticipatory Set	Team Teaching	**Question** - What do you know or what can you remember about equations? GE guides students to understand an equation has at least one number, one variable, an equal sign, and a solution. GE provides a variety of equations and expressions on the chalk board, whiteboard, or interactive whiteboard. GE asks students to help sort equations into the proper category (equation vs. expression) based on what they know. GE points out the most obvious difference (visually) between the two (one has an equal sign and the other does not).	SE same as GE.
Lesson Activities/ Procedures	One teach/One assist	1. GE provides students with the Evaluating Expressions Notes handout and discusses the definition for and provides examples of the terms provided.	1. SE assists students with following along, maintaining attention, and completing notes during note-taking activity.

Lesson Component	Co-Teaching Approach(es)	General Educator (GE)	Special Educator (SE)
		2. GE presents students with the expression 2b - c and asks students if they can simplify it. Students should realize that there is nothing they can do with this expression. GE tells students that b = 5 and c = 3. GE asks if they can now simplify the expression. 3. GE uses four to five additional sample problems on the board to demonstrate how to evaluate an expression given replacement value(s). GE completes the first two expressions together as a class. GE instructs students to complete the remaining expressions independently, reviewing each one as a class before moving on. 4. GE distributes the Evaluating Expressions with Candy worksheet and snack-size bags of colored candies. The colors represent the variables. GE has students sort their candy according to color and record the values on the worksheet. Students can substitute a number cube for	2. SE assists students with following along with the teacher/sustaining attention during the sample problem demonstration. SE assists students with evaluating expressions independently, as needed.

Lesson Component	Co-Teaching Approach(es)	General Educator (GE)	Special Educator (SE)
		candy. Roll a number cube six times to establish values for each of the variables. 5. Students evaluate each expression, using the values of the candy (or rolls of a number cube). GE instructs students to show all steps in evaluating expressions.	
Guided/ Independent Practice	Parallel Teaching	GE divides students into two different groups, based on their need for additional support. 1. GE distributes the Real Life Mathematics worksheet. GE reviews a sample problem to demonstrate how the same formula/expression is used to complete each section or activity (i.e., bowling, skating, etc.). 2. GE instructs students to complete the activity independently.	SE divides students into two different groups based on their need for additional support. 1. SE distributes the Real Life Mathematics worksheet. SE reviews a sample problem to demonstrate how the same formula/expression is used to complete each section or activity (i.e., bowling, skating, etc.). 2. SE works with group to set up the problems for each section. 3. SE instructs students to complete the activity independently.
Closure	One Teach/One Assist	GE distributes bingo chips and game cards. GE displays an expression with replacement values and asks students to evaluate it. Students should mark their board if they have the solution. Continue	SE same as GE.

Lesson Component	Co-Teaching Approach(es)	General Educator (GE)	Special Educator (SE)
		until a student wins.	
Formative Assessment Strategies	Team Teaching	GE instructs students to complete an exit ticket.	SE same as GE.
Homework	Team Teaching	GE instructs students to complete Evaluating Real Life Mathematics worksheet, if necessary.	SE same as GE.

Specially Designed Instruction (teacher teaches)
- The teacher can model and verbally repeat each step of the process when substituting the values for the variables and using the order of operations.
- When assigning the Real Life Mathematics activity, provide an example for each section of to ensure that all students understand how each expression is used.

Accommodations (based on student needs)
- Students requiring a copy of classroom notes should receive a copy of completed notes.
- Reduced number of problems assigned for those who need shortened assignments.

Modifications
- Students who need a modified curriculum could be provided the activity sheets in which the values have been filled in on each line and their only requirement is solving (eliminates substituting step) problems.

Notes
- "Special educator" as noted in this lesson plan might be an EL teacher, speech pathologist, or other specialist co-teaching with a general educator.
- Free bingo cards can be found on the Internet.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

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Evaluating Expressions Notes

EVALUATING EXPRESSIONS—NOTES

NUMERICAL EXPRESSION

A numerical expression contains only

_____ and _____

EXAMPLE(S)

ALGEBRAIC EXPRESSION

An algebraic expression may contain

_____ , _____, and

one or more _____.

EXAMPLE(S)

CONSTANT

A constant is a _____. Its value

is always the _____.

EXAMPLE(S)

VARIABLE

A variable is a _____ that

stands for a _____.

EXAMPLE(S)

OPERATION

Math operations include _____,

_____, _____, and

_____.

EXAMPLE(S)

TERM

A term is a _____ , a

_____ or a combination of both.

Evaluating Expressions Notes (key)

EVALUATING EXPRESSIONS—NOTES

NUMERICAL EXPRESSION

A numerical expression contains only

___numbers___ and ___operations___

EXAMPLE(S)

ALGEBRAIC EXPRESSION

An algebraic expression may contain

___numbers___ , ___operations___ , and

one or more ___variables___ .

EXAMPLE(S)

CONSTANT

A constant is a ___number___ . Its value

is always the ___same___ .

EXAMPLE(S)

VARIABLE

A variable is a ___letter___ that

stands for a ___number___ .

EXAMPLE(S)

OPERATION

Math operations include ___addition___ ,

___subtraction___ , ___multiplication___ , and

___division___ .

EXAMPLE(S)

TERM

A term is a ___number___ , a

___letter___ or a combination of both.

Evaluating Expressions with Candy

Name _____ Date _____

Separate your bag of candy into color sets designated with the following variables.

g=green   b=blue   d=dark brown   r=red   o=orange   y=yellow

Record the number in each set to find the values of each variable.

$g=$_____ $b=$_____ $d=$_____

$r=$_____ $o=$_____ $y=$_____

Evaluate each expression for the replacement values found above. Be sure to show ALL work.

$5r + 2d$ $6 + 5(y + g)$ $3y - 5b$

$b^2 + 3b - 10$ $(3r + 6) - d$ $(4g-2)^2$

Create 2 expressions of your own and have a classmate evaluate them using their data.

_____   _____

Evaluate 2 expressions created by a classmate using your data and show all work below.

_____   _____

Real Life Mathematics

Name: _____

Directions: Use the replacement values provided to determine the cost of each scenario.

Bowling

Number of Games (g) and Pairs of Shoes (s)	$2.50g + 2s	Total
12 games & 3 pairs of shoes		
9 games & 3 pairs of shoes		
15 games & 5 pairs of shoes		
Is $45 enough to pay for 12 games and 3 pairs of shoes?		Yes/No

Skating

Number of Friends (f) and Pairs of Skates (s)	$5.00f + 2s	Total
3 friends & 3 pairs of skates		
5 friends & 5 pairs of skates		
7 friends & 7 pairs of skates		
Is $55 enough for 7 friends and 7 pairs of skates?		Yes/No

Movies

Number of Tickets (t) and Popcorn (p)	$8.50t + $3.00p	Total
5 tickets & 3 containers of popcorn		
4 tickets & 4 containers of popcorn		
9 tickets & 4 containers of popcorn		
Is $50 enough to pay for 5 tickets and 3 containers of popcorn?		Yes/No

Real Life Mathematics (key)

Real Life Mathematics

Directions: Use the replacement values provided to determine the cost of each scenario.

Bowling

Number of Games (g) and Pairs of Shoes (s)	$2.50g + 2s	Total
12 games & 3 pairs of shoes	2.5 * 12 + 2 * 3	$36
9 games & 3 pairs of shoes	2.5 * 9 + 2 * 3	$28.50
15 games & 5 pairs of shoes	2.5 * 15 + 2 * 5	$47.50
Is $45 enough to pay for 12 games and 3 pairs of shoes?		Yes/No

Skating

Number of Friends (f) and Pairs of Skates (s)	$5.00f + 2s	Total
3 friends & 3 pairs of skates	5 * 3 + 2 * 3	$21
5 friends & 5 pairs of skates	5 * 5 + 2 * 5	$35
7 friends & 7 pairs of skates	5 * 7 + 2 * 7	$49
Is $55 enough for 7 friends and 7 pairs of skates?		Yes/No

Movies

Number of Tickets (t) and Popcorn (p)	$8.50t + $3.00p	Total
5 tickets & 3 containers of popcorn	8.5 * 5 + 3 * 3	$51.50
4 tickets & 4 containers of popcorn	8.5 * 4 + 3 * 4	$46
9 tickets & 4 containers of popcorn	8.5 * 9 + 3 * 4	$88.50
Is $50 enough to pay for 5 tickets and 3 containers of popcorn?		Yes/No