

# Bachelor of Education (Elementary) & Bachelor of Education (Secondary) STEM Lesson Plan

Lesson Title: _	Variable Equation Practice	Lesson #	3 (of four in unit)	Date:	April 8, 2020
Name: _	Melissa Green	Subject:	Mathematics	Grade(s):	4

#### **Rationale:**

This lesson allows students with the experience of working with a partner to solve addition and subtraction equations with an unknown variable. This lesson will allow for further learning moving forward in algebra to include more difficult questions. Having students work at the white board will allow the teacher to see which students are engaged, which students are struggling and where more teaching and practice needs to take place to support students in reaching success.

#### **Core Competencies:**

Communication	Thinking	Personal & Social
Communicating	• Critical and reflective thinking	• Personal awareness and
This lesson sees multiple	Students will both be examining	responsibility
communication skills both with other	their own thinking and the	Throughout this lesson students
students, with the teacher, and with	thinking of other students through	will be expected to self-regulate
the whole class. Students are	this lesson. This will be done	their behaviours to meet the
engaging in listening, the	though observation, sharing, and	expectations of the learning time
interpretation of information, and the	hands on learning.	together. Students will self-
consideration of diverse perspectives		advocate by expressing their
connected to their learning.	Creative thinking	individual learning needs and seek
	Through this lesson students will	help as they need it. In the midst of
	be engaging in the generation of	learning new material students will
	ideas and strategies. Through	learn how to self-persevere in the
	hearing the thinking of other	midst of engaging with new
	students they will be both	concepts.
	evaluating their own thinking and	
	further developing their thinking.	• Social awareness and
		responsibility
		while learning new material,
		students will be engaging in
		students who have different weve
		of solving the same problem
		Students will learn how to show
		empathy disagree respectfully and
		create space for others to use their
		voice
		Students will learn how to show empathy, disagree respectfully, and create space for others to use their voice.

#### **Big Ideas (Understand)**

Development of computational fluency and multiplicative thinking requires analysis of patterns and relations in multiplication and division.

#### **Learning Standards**

( <b>DO</b> )	(KNOW)
Learning Standards - Curricular Competencies	Learning Standards - Content
• CC1 – Use reasoning to explore and make connections	• C1 - Algebraic relationship among quantities
• CC14 – Reflect on mathematical thinking	

## Instructional Objectives & Assessment

Instructional Objectives (students will be able to)	Assessment
• TSWBAT work with a partner to complete the practice sheet questions on the board.	• Formative <i>for</i> learning and Formative <i>as</i> learning What: Students will complete the equations on the practice sheet on the white board. How: Teacher will observe and make notes about the work taking place on the boards while circulating the classroom. Students will be learning from one another as they work together.
• TSWBAT explain to the teacher their thinking and solving process using mathematical language.	Formative <i>for</i> learning What: Student explains their thinking and solving process using mathematical language. How: Teacher asks the student questions and prompts further thinking.
• TSWBAT share one thing they have learned with the class.	Formative <i>as</i> learning <b>What:</b> Students will share one thing they have learned with the class. <b>How:</b> Students will learn from one another.

## Prerequisite Concepts and Skills:

- Students are familiar with the expectations for working at the white boards
- Students are familiar with using both words and numbers to describe changing patterns
- Students have grasped the core concepts of addition, subtraction, multiplication and division
- Students have learned about the terminology and symbols of equations with missing variables
- Students are familiar with engaging in "Number Talks" as the beginning of a lesson

#### **Indigenous Connections/ First Peoples Principles of Learning:**

"Learning involves patience and time."

This lesson honours the fact that learning pre-algebraic and algebra skills will take both patience and time. Students will be given the time and space that they need individually to grasp these skills and experiences. When inviting students to respond and explain their sharing a generous wait time will be given to allow students the opportunity to consider and gather their thoughts and then share their thinking or ask their question. Students will also be given the time at the white boards to engage to work on problems with a missing variable with a classmate for collaboration and learning together.

## Universal Design for Learning (UDL):

- Students will have expectations of work shared both verbally and through a sample where possible. This will meet the needs of both auditory and visual learners.
- The teacher will use a variety of assessment forms in order to reach each student.
- The activities can be adapted so that each student can be successful and reach their individual learning goals.

## **Differentiate Instruction (DI):**

- Different levels/versions of practice sheets can be made to meet the learning goals of different students. In this lesson students who are more likely to need more challenge will be paired together and students who may require a more simple entry point will be paired together.
- Body breaks
- Break cards
- Brain breaks
- Fidgets

- Standing tables
- Flexible seating
- Headphones

## **Materials and Resources**

- Copies of practice sheet
- White board pens/erasers and white board space
- Manipulatives in the math centre, accessible to students

## **Lesson Activities:**

Teacher Activities	Student Activities	Time
<ul> <li>Introduction (anticipatory set - "HOOK"):</li> <li>Have the "Number Talk" on the board: <ul> <li>2 + x = y with a group of number options for students to match into the equation: 2, 4, 6, 10, 12, 15, 15, 7</li> </ul> </li> <li>Give students time to come up with different ways to make the equation true</li> <li>Chime to gather students attention</li> <li>Invite students to share their Number Talk solutions, write it on the white board as students share</li> </ul>	<ul> <li>Students engage in the Number Talk at their desks</li> <li>Students stop and give their attention to the teacher</li> <li>Students raise their hand if they have something to share and speak when called upon</li> </ul>	5 min
<ul> <li>Body:</li> <li>Invite students to share about what we learned in yesterday's math lessons. If students don't cover details about symbols and variables in relation to equations with unknown variables ensure it is covered and tie in a review of some sample equations with unknown variables.</li> <li>Share with students that we will be doing some whiteboard work in partners: students will be paired up, each pair will get a practice sheet which includes some of the number sentences they made yesterday as their "ticket out". In pairs students will go to one of the areas at the white board where pens and erasers are set out</li> </ul>	<ul> <li>Students raise their hand if they have something to share and speak when called upon</li> <li>Students pay attention and engaging in solving the sample equations with the teacher</li> <li>Students are paying attention to instructions</li> </ul>	7 min
<ul> <li>Ask students to share what expectations there are for partner white board work.</li> <li>Share any expectations that student's don't cover.</li> <li>Pair off students, handing them a practice sheet as they are paired off. Pairs find a spot at a white board to work once they've received the sheet.</li> <li>Student work block</li> <li>Circulate the classroom offering support to students and making notes of areas that need further teaching and practice. Have pairs of students explain their thinking and solving process as your circulate the class.</li> </ul>	<ul> <li>Students raise their hand if they have an expectation to contribute and share when called upon</li> <li>Students find a spot at a white board when paired off and provided practice sheet</li> <li>Students work with their partner at the board on the problems listed on the sheet</li> <li>Students share with teacher as the teacher circulates.</li> </ul>	15 min
<ul> <li>Closure:</li> <li>Ring the chime to gain student attention.</li> <li>"Zipper" – go around the classroom where students are standing and quickly go from student</li> </ul>	<ul> <li>Students stop and give their attention to the teacher</li> <li>Students share one after another</li> </ul>	4 min

to student as they each share one thing they learned or did for the first time during our work block.		
• Thank the students. Invite them to erase the white boards and put the practice sheet in the bin provided. Provide instructions for what is coming next.	• Students erase the boards and put practice sheets in the and then follow next step instructions.	

## **Organizational Strategies:**

- Use the chime to gain classroom attention
- Hand out practice sheets as students are paired off
- Have white board pens and erasers already at the white board work areas
- Have a bin out for the practice sheets at the end of the lesson.

## Proactive, Positive Classroom Learning Environment Strategies:

- Depending on what block is taking place before this lesson a "brain break" may begin the lesson as a way of moving and refocusing into what is to come.
- Teacher will move around the room during the work block and provide encouragement and support to students.
- Students who are one task will be praised.
- Challenges will be dealt with in a respectful manner and not publically wherever possible.
- Expectations around behaviour will be reviewed before the work block begins.
- Wait seven seconds after asking a question to allow time for students to process and think about their answer or question.
- Teacher will spend more time near students who are distracting one another or off task and provide ongoing support. If necessary, students who are distracting one another will be moved to different work areas.

#### **Extensions:**

• This lesson will be extended further within the unit moving towards solving equations with unknown variables through number sentences at a more difficult level, beginning to transition into including solving equation using multiplication.

#### **Reflections (if necessary, continue on separate sheet):**

N/A