

Bachelor of Education – Elementary Unit Plan Template

Unit Title: Algebraic relationships – Addition and Subtraction Variables
Number of Lessons: 4
Time (in weeks): 1
Name: Melissa Green
Subject(s): Mathematics
Grade(s): 4

Rationale

This unit is important as it is the introduction to algebra for students. This is a concept they will encounter more and more frequently with each increasing grade. This foundation is important to set students up for success and the unit allows for the flexibility of how much time the teaching and learning of these foundational skills takes for future success in algebra. It may unfold as outlined in this mini-unit or some lessons may take more than one class to allow for students the time needed to gain the grasp of the concepts being taught and modeled. The unit requires that students have already had good foundational learning around patterns, addition, subtraction, multiplication and division.

Overview

This unit begins with a CGI lesson looking for different strategies of how to use algorithms to solve problems where there is a missing number; this will be a familiar learning tool for the students. Students will begin to reflect on real life situations where they have had to find missing information/missing number. Students will participate in a Math Story which will lead itself into learning about the terminology and concepts of algebra in anticipation of the next lesson, they will begin to write their own number sentences with a missing variable. Students will engage in partner practice work on the board and share their thinking with the teacher; they will begin to use the mathematical language that is modeled in their work in their sharing with the teacher and classmates. Finally, students will work independently on work problems and number sentences with variables using addition and subtraction.

CORE COMPETENCIES

Communication	Thinking	Personal & Social
<ul style="list-style-type: none"> <i>Communicating</i> This unit embodies multiple communication skills both with other students, with the teacher, and with the whole class. Students are engaging in listening, the interpretation of information, and the consideration of diverse perspectives connected to their learning. <i>Collaborating</i> Students will work with other students throughout this unit and will consider the perspectives, strategies, and efforts of others' while engaging in a common goal and purpose. 	<ul style="list-style-type: none"> <i>Critical and reflective thinking</i> Students will both be examining their own thinking and the thinking of other students through this unit. This will be done through observation, sharing, and hands on learning. They will engage in questioning and at times trial and error – the development of their own ideas in relation to the problems they are facing. Connected to this, they will be reflecting on and assessing their learning. <i>Creative thinking</i> Through this unit students will be engaging in the generation of ideas and strategies. Through making connections with other students and hearing the thinking of other students they will be both evaluating their own thinking and further developing their thinking. 	<ul style="list-style-type: none"> <i>Personal awareness and responsibility</i> Throughout this unit students will be expected to self-regulate their behaviours to meet the expectations of the learning time. Students will self-advocate by expressing their individual learning needs and seeking help as they need it. In the midst of learning new material students will learn how to self-persevere in the midst of engaging with new concepts. <i>Social awareness and responsibility</i> While learning new material, students may need to engage in problem solving with other students who have different ways of solving the same problem. They will learn how to show empathy, disagree respectfully, and create space for others to use their voice.

BIG IDEAS

(multiple subject areas for integrated unit)

Subject Name: Mathematics	Subject Name:	Subject Name:
Development of computational fluency and multiplicative thinking requires analysis of patterns and relations in multiplication and division.	N/A	N/A

LEARNING STANDARDS

Curricular Competencies	Content
CC1 - Use reasoning to explore and make connections CC9 – Engage in problem-solving experiences that are connected to place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and other cultures CC14 – Reflect on mathematical thinking CC16 – Connect mathematical concepts to each other and to other areas and personal interests	C1 – Algebraic relationship among quantities

Prerequisite Concepts and Skills

- Students are familiar with the CGI model, routines, and expectations
- 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

Teacher Preparation Required

Lesson 1	• Prepare and print CGI Story sheets
Lesson 2	• Prepare and print math story template, copies of ticket out
Lesson 3	• Printed Practice Sheets
Lesson 4	• Printed Practice Sheets, Ball

Cross-Curricular Connections

This lesson ties into English Language Arts through the use of story and through students sharing their thinking and strategies.

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. Some of the math stories shared will incorporate Indigenous ways of learning and content, i.e.: fishing. The unit involves reflection, collaboration, discussion, and storytelling.

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.
- Students will be given the option to move around the classroom as meets their needs.
- Students will get to choose where to work, whenever possible.
- 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.

Differentiated Instruction (DI)

- Different levels/versions of practice sheets can be made to meet the learning goals of different students.
- Body breaks
- Break cards
- Brain breaks
- Fidgets
- Standing tables
- Flexible seating
- Headphones

Overview of Lessons:

Lesson 1

Name & Time (Minutes Allotted):	CGI Lesson (30 min)
Learning Standards: Curricular Competencies	CC1, CC9, CC14, CC16
Learning Standards: Content	C1
Instructional Objectives	TSWBAT complete the CGI story sheet and engage in conversation with the teacher as prompted. TSWBAT share their strategy for solving the problem with the class. (as chosen and called upon.) TSWBAT share with a partner.
Assessment:	Formative <i>for</i> learning What: CGI story sheet How: Teacher will review the student work and engage in conversation. Formative <i>as</i> learning What: Students sharing their strategy, as chosen and called upon How: Students will learn from one another as sharing takes place. Formative <i>as</i> learning What: Pair and Share How: Students will listen to a partner share and learn from them.
Teaching Strategies:	CGI story, manipulatives, pair and share
Materials:	CGI story sheets
Lesson Activities:	
Introduction/Hook:	Share CGI story – “James’ family went fishing on Tuesday and caught 17 fish. On Wednesday his family packed a lunch and went fishing for the whole day. On Thursday they counted the total number of fish they had caught that week so far; they had caught 53 fish. How many fish did James and his family catch on Wednesday?”
Body:	Hand out CGI sheets and invite students to work on the problem. Have manipulatives available in the classroom for student use. Circulate through the class , making observations, engaging in conversations, wondering with students; make a list of students to invite to share how they solved the problem. Look for a student who used a model that showed they were seeking the missing number using an algorithm, i.e.: $17 + \underline{\quad} = 53 \rightarrow 53 - 17 = 36$ Gather the class together, invite student strategy sharing. Engage the class in some communication questions about what they’ve

	noticed between the strategies shared.
Closure:	Ask students to share with their seat partner a time when they had to find a way to discover an unknown number and how they worked to find the number. (ie: when cooking something, sorting something, creating something)

Lesson 2

Name & Time (Minutes Allotted):	Algebra Math Story (30 min)
Learning Standards: Curricular Competencies	CC1, CC9, CC14
Learning Standards: Content	C1
Instructional Objectives	TSWBAT complete the math story sheet. TSWBAT write a number sentence with an unknown variable.
Assessment:	Formative <i>for</i> learning What: Completed math story sheet How: Teacher will circulate the classroom, taking note of student work and learning. Teacher will also review all sheets after the lesson has taken place. Formative <i>for</i> learning What: Ticket Out How: Teacher will review and look for understanding about symbols and missing variables in equations.
Teaching Strategies:	Math story, worksheet/story template, student sharing, direct teaching
Materials:	Math Story Template, copies of ticket out
Lesson Activities:	
Introduction/Hook:	Share with students the math story for the day: “You and your friend when to the beach and collected 53 shells. You collected 23 shells. How many shells did your friend collect?” Ask some “I wonder” questions to make sure students are all on the same page.
Body:	Hand out Math Story sheet and invite students to work independently. Circulate the classroom and make note of two students to share their strategy who connect to a “missing variable” model. Facilitate strategy sharing. Enter into teaching some terminology and symbols around variables... while we may be looking for a missing variable through a math story like we did yesterday and today sometimes the missing number, the unknown variable, is expressed through a symbol. Show students some examples of what a number sentence might look like with an unknown variable. Engage in some “I wonder” questions with the students to receive student responses and thinking. Walk through some responding to questions together.
Closure:	Ticket Out: have students write their own number sentence with an unknown variable.

Lesson 3

Name & Time (Minutes Allotted):	Variable Equation Practice (30 min)
Learning Standards: Curricular Competencies	CC1, CC14
Learning Standards: Content	C1
Instructional Objectives	TSWBAT work with a partner to complete the practice sheet questions on the board. TSWBAT explain to the teacher their thinking and solving process using mathematical language. TSWBAT share one thing they have learned with the class.

Assessment:	<p>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.</p> <p>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.</p> <p>Formative <i>as</i> learning What: Students will share one thing they have learned with the class. How: Students will learn from one another.</p>
Teaching Strategies:	Number talk, review, whiteboard work
Materials:	Printed Practice Sheet, white board pens/erasers/space
Lesson Activities:	
Introduction/Hook:	Number Talk: “Make it True”... put a variable equation on the board: $2 + x = y$ with a group of number options of students to match into the equation: 2, 4, 6, 8, 10, 12, 14, 15, 7, etc.
Body:	<p>Review yesterdays lesson, invite students to share things that they remember from yesterdays lesson.</p> <p>Solve a few variable equation questions together on the board.</p> <p>Hand out a practice sheet (created from the number sentences they made the day before for their “ticket out”) for students to work on in pairs. Invite students to use manipulatives to support their learning if they wish. Students will work on the problems on designated parts of the white boards in the classroom.</p> <p>Circulate the classroom supporting students and making note of areas where students would benefit from more teaching and practice. Invite pairs to students to explain their thinking and solving process as you circulate through the classroom.</p>
Closure:	Zipper: go around the classroom from student to student quickly as each student shares one thing they have learned.

Lesson 4

Name & Time (Minutes Allotted):	Variable Problems: Word and Number Problems (30 min)
Learning Standards: Curricular Competencies	CC1, CC9, CC14
Learning Standards: Content	C1
Instructional Objectives	<p>TSWBAT complete the practice sheet.</p> <p>TSWBAT share with the class some of their reflection on their learning so far: wonders or confusion</p>
Assessment:	<p>Summative <i>of</i> learning What: Practice Sheet How: Teacher will review the completed practice sheets</p> <p>Formative <i>as</i> learning What: Ball Pass How: Students will be learning from one another as they hear classmates share, teacher will use this information to form next pieces of learning (which</p>

	makes this formative <i>for</i> learning for the teacher)
Teaching Strategies:	Number talk, practice sheet, reflecting and sharing, teacher circulation
Materials:	Printed Practice Sheets, Ball
Lesson Activities:	
Introduction/Hook:	Number Talk , same process as lesson 3 with more difficult equation.
Body:	Practice Sheet with Word and Number Problems. Word problems are a mix of problems that they will solve and problems they read and then choose the correct variable equation to go with the world problem was a selection of 4 possible answers. The number problems will be an extension of what they worked on yesterday with a partner, with problems increasing in difficulty as appropriate based on yesterdays class.
Closure:	Ball Pass: Students stand in a circle around the classroom; a ball is passed across the classroom from student to student. As each student catches the ball they answer one of two questions in relation to variable equations: 1) I wonder about... 2) I am still confused about...

Resources

<https://ca.ixl.com/standards/british-columbia/math/grade-4>
<https://www.mathsisfun.com/links/curriculum-year-4.html>

Extensions to Unit

This unit should be extended into input/output tables and algebraic equations with multiplication and division.

Reflections and Revisions

N/A