



Course: Math 10

Teacher: Martin

Unit: Linear Systems

Date: Start on April 23

Duration: Approximately 6-7 weeks

Description: We will learn about systems of linear equations and how to solve them. We will begin by graphically solving and interpreting solutions. Then we will learn how to solve using algebra (substitution and elimination). We will learn how to write mathematical models, using systems of linear equations, to represent real-life situations, and solve the systems to answer questions. We will also learn how to check if a solution is correct, and work towards being able to identify and correct mistakes in our own work.

	Big Ideas	Essential Questions
Understand	<p><i>Which Big Ideas will be the focus of this unit?</i></p> <ul style="list-style-type: none"> Representing and analyzing situations allows us to notice and wonder about relationships. Algebra allows us to generalize relationships through abstract thinking. 	<p><i>What questions will be guiding your students' inquiry?</i></p> <ul style="list-style-type: none"> What does the intersection point of two linear equations represent? How many solutions are possible when solving a linear system? How can we tell when a linear system has no solution or an infinite number of solutions? What connections can we make between linear equations and linear equations? How can we check to see if our solution to a linear system is correct? After solving a problem, how can we interpret the solution in the context of the problem? After solving a problem, can we extend or generalize it? How can we take a real-life problem and turn it into a system of linear equations that we can solve? How can we tell if a math solution is reasonable? Where are we most likely to make errors? How can we avoid these? How can we identify and correct our errors?

	Core Competencies	Curricular Competencies
Do	<p>Communication</p> <p>Creative Thinking</p> <p>Critical Thinking</p> <p>Personal Awareness and Responsibility</p>	<p>Reasoning and modelling</p> <p>Understanding and solving</p> <p>Estimating reasonably</p> <p>Applying multiple strategies</p> <p>Connecting</p> <p>Explaining and justify</p>

		<p>Communicating</p> <p>Reflecting</p>
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Curricular Content		
Know	<p><i>Which Curricular Content will students learn and be assessed on this unit?</i></p> <ul style="list-style-type: none"> • Represent a linear system graphically, using a table, and using equations • Solve a linear system graphically, with and without technology • Solve a linear system algebraically, using substitution and elimination methods • Choose the best algebraic method to solve a system of linear equations • Check a given point to determine if it is a solution to a linear system by substituting and then evaluating • Translate word problems into a system of linear equations that can be solved (mathematical modelling) • Understand why systems of linear equations can have zero, one or an infinite number of solutions • Identify the number of solutions to a linear system by examining the equations and by graphing • Solve real-life problems by writing a system of linear equations, solving, and interpreting the solution in the context of the problem 	<p><i>Which activities, projects, exercises or discussions will teach this Curricular Content?</i></p> <ul style="list-style-type: none"> • Identify the solution to a linear system visually by graphing, by hand and also using technology (Desmos.com) • Connect the graphical solution for a linear system with the algebraic methods of solving linear systems • Develop fluency with solving linear systems algebraically through practice, using both substitution and elimination methods • Develop fluency with mathematical modelling through practice, by interpreting real-life problems, writing them as linear systems, solving (both graphically and algebraically), and interpreting the solutions in the context of the problem • Relate real-life problems to personal experiences to help interpret problems • Engage in regular discussions with the teacher, to ask questions to support learning, and to demonstrate understanding • Build confidence and increase fluency with linear systems by playing games (using technology – Desmos.com)

First Peoples Principles of Learning

Through discussions, independent work and self-reflection, students will have the opportunity to reinforce the following First Peoples Principles of Learning:

- Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits and the ancestors.
- Learning is holistic, reflexive, reflective, experimental, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).
- Learning is embedded in memory, history, and story.
- Learning involves patience and time.

Unit Assessment

For Learning: Formative Assessment

- Check of specific questions from homework
- Check-in quizzes through Google Forms, completed after each new lesson
- Participation in video conferences

As Learning: Reflection/Self-Assessment

- Self-assessments through Google Forms

Of Learning: Summative Assessment

- Tests, one for solving systems graphically (Ch 8) and one for solving systems algebraically (Ch 9)

Required Resources

- Computer for online lessons, activities and video-conferencing
- Notebook, graph paper, pencil, eraser, ruler, calculator
- The Centre for Education in Mathematics and Computing Courseware – Grades 9-10-11 Mathematics:
<https://cemc.uwaterloo.ca/resources/courseware/grade-9-10-11.html>
 Unit 6: Solving Linear Systems, Lessons: #1, 2, 3
- Desmos: <https://student.desmos.com/> _Class Codes: Will Be Given in Class
 - Solutions to Systems of Linear Equations
 - Systems of Two Linear Equations
 - Polygraph: Linear Systems
 - Make them Balance
 - Card Sort: Linear Systems
 - Racing Cars
 - Investigating T-Shirt Offers
- Explore Learning, Gizmos: <https://www.explorellearning.com/> _Class Code: Will Be Given in Class
 - Solving Linear Systems (Slope-Intercept Form)
 - Solving Linear Systems (General Form)
 - Solving Linear Systems (Matrices and Special Solutions) - EXTENSION
- Mathematics 10 textbook (McGraw-Hill Ryerson), Chapters 8 and 9