Grade 8 Math Unit 4

Canterbury Public Schools

Subject	Math
Grade Level	8
Unit Title	Linear Equations and Linear Systems
Unit Goals	1. **Solve Complex Equations**: Solve linear equations with variables on both sides, including those requiring the distributive property and combining like terms. 2. **Use Balanced Representations:** Use hanger diagrams and algebraic moves to maintain equality while solving. 3. **Analyze Number of Solutions**: Determine if a linear equation has one solution, zero solutions, or infinitely many solutions. 4. **Interpret Solutions in Context:** Understand the meaning of solutions within real-world scenarios. 5. **Understand "System" Solutions:** Identify that a solution to a system of two linear equations is a pair of values that makes both equations true simultaneously. 6. **Solve by Graphing:** Estimate solutions to a system of equations by identifying the point of intersection on a graph. 7. **Solve Algebraically:** Solve systems using substitution or by setting expressions equal to each other. 8. **Interpret System Contexts:** Write and solve systems of equations from real-world problems (e.g., comparing costs).
Pacing (# of weeks)	3 - 4 weeks
Standards	8.EE.C.8a, 8.EE.C.8c, 8.EE.c.8
Content/Conceptual Knowledge (know)	Solutions to systems Methods of solving systems
Skills (be able to do)	Linear Equations in One Variable ● Solve multi-step equations with variables on both sides. ● Identify equations with one solution, no solutions, or infinitely many solutions. ● Interpret solutions to equations within real-world contexts. ● Use the "balanced hanger" model to understand maintaining equality when manipulating equations Systems of Linear Equations (Two Variables) ● Define a solution to a system as the ordered pair (x,y) that satisfies both equations. ● Solve systems by graphing and identify the intersection point as the solution.

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Solve systems algebraically (using substitution or elimination).
Interpret solutions to systems in context.
Determine if a system has one, none, or infinite solutions based on their graphs (parallel, intersecting, or coinciding lines).

Graphical Representations & Connections

Connect algebraic solutions to graphical representations (i.e., a point on a line satisfies the equation).
Translate real-world scenarios into two-variable equations and systems.
Graph linear equations using slope-intercept form y=mx+b.
Compare different strategies for solving systems to determine the most efficient method.

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<tr><td>Essential Questions</td><td>

How can we solve linear equations with variables on both sides, and what do the solutions mean?
What are the different types of solution sets for a single linear equation (one, none, or infinitely many), and how do we identify them?
What is a system of linear equations, and what does its solution represent graphically and algebraically?
What are the different methods for solving systems of linear equations (graphing, substitution, elimination), and when should we use each?
How can linear equations and systems be used to model and solve real-world problems?

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<tr><td>Enduring Understandings</td><td>Systems model real-world situations with multiple constraints</td></tr>
<tr><td>Vocabulary</td><td>System, solution, intersection</td></tr>
<tr><td>Common Learning Experiences</td><td>Use hanger diagrams to represent equality and draw arrows that connect equivalent representations
Use algebraic equations and writing equivalent equations with the intention of solving for a variable
Real-world modeling tasks</td></tr>
<tr><td>Assessments</td><td>
Assessment Map
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<tr><td>Practice</td><td>Knowledge</td><td>Classwork & Homework</td></tr>
<tr><td>Formative</td><td>Skill</td><td>Daily Cool Downs</td></tr>
<tr><td>Summative</td><td>Product</td><td>Unit Checkpoints & Tests</td></tr>
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Student Resources	Graph paper
Teacher Resources	Tasks and visuals