Teacher: J. Cummins	Course: Algebra I	Grade Level: 9	# of Students: 25
Theme: Using Algebra to Save Money	Unit: Solving Systems of Equations		Lesson: Solving Systems of Equations by Graphing
Standards	Common Core Math Standard A.REI.C.6: Solve systems of linear equations exactly and approximately (e.g. with graphs), focusing on pairs of linear equations in two variables.		
Learning Objectives	Given a system of linear equations, students will be able to identify the solution by graphing the two equations then writing the coordinates of the point of intersection.		
Prior Knowledge	- Graphing a linear equation - Basic understanding of solutions of a linear equation - Familiarity with Chromebooks and Bears Den email system		
Engage	Students will work in groups using large butcher paper to graph $y=x+3$ and $y=2x+1$ on the same coordinate plane. Then students will graph $3x+y=9$ and $x+2y=8$ on a second coordinate plane.		
Elicit	Students will then answer the following questions on the butcher paper: Do your graphs intersect? (Yes) If so, where? (Give coordinates) What is the significance of this point? (It is a solution to each equation)		
Explore	Finally, have students graph the equations $y=-2x-5$ and $4x+2y=8$, also on butcher paper. What do you notice about the graphs of these? (They are parallel)		
Explain	In whole class discussion, define *system of linear equations* and *solution of linear equations*. Reinforce that the solution of a system of linear equations can be found by graphing both lines and finding the point of intersection. This point solves BOTH equations. If the lines are parallel, then there is no solution. If the lines are the same line, then there are infinitely many solutions.		
Elaborate	Students will then work individually using Chromebooks and the web app desmos.com graphing calculator to find the solutions to the following systems of linear equations: 1. $2x + y = -2$ and $y = -3x - 5$ 2. $y = x - 12$ and $2x + 3y = 6$ 3. $y=5$ and $3x+y=5$ 4. (See extend problem below) After graphing each set, students should click on the point of intersection. Then they will take a screenshot and save it. Once finished, students will email the four screen shots to the teacher, along with an explanation for #4.		
Extend	David decides to rent a bike while on vacation. There are 2 shops from which to choose. Rent-a-Bike charges $10 per hour per bike. Bike-O-Rama charges only $4 per hour per bike, but with a deposit of $15 per bike. Which is the better deal?		
Evaluate	Before leaving class, each student will write their name on the back of a post-it note and place it on the stop light by the doorway. Red=I do not understand this lesson. Yellow=I am beginning to understand, but need more practice. Green=I feel confident with today's material.		

Assessment	Formative assessment: • Observation of group activity • Observation of technology activity • Stop-light self-evaluation tool Summative assessment: • Checklist for emailed screen captures (see handout)
Materials Needed	Butcher paper Markers Chromebooks Desmos activity handout
Technology	Utilizing Chromebooks, students will use graphing calculator web app to graph systems of linear equations to find their solutions. They will screen capture and email their results to the instructor.
Differentiated Instruction	Students in my class are already seated in heterogeneous groups of three that are used frequently during instruction. Students already know who their group members are and the procedures for getting in and out of group work time. Due to the mixed ability groupings, stronger students are able to help struggling students understand concepts. This is a co-taught class, so both teachers are able to circulate during the group activity and the technology activity providing targeted support as needed. The technology activity provides support for struggling students because they are able to quickly graph and see the significance of the solution of the system of equations without having to struggle with the details of graphing by hand.