

Lesson Plan Template Draft: SACC Active Learning Guide Book

Lesson 4.2 Solving Systems of Linear Equations Using Substitution (hybrid)

Teaching Point/Objectives:

Students will be able to algebraically determine and represent linear systems of equations using substitution. They will understand, without the aid of a graph, that all linear system of equations have a unique solution, infinitely many solutions or no solution

25 – 35 mins.

Materials:

- MyMathLab
- Videos
- Beginning and Intermediate Algebra, 6th edition, Elayn Martin-Gay, Pearson
- White board
- Computer
- Document Camera
- Overhead Projector
- Various Color Markers

Active learning strategies that this lesson employs:

- MyMathLab
- Videos
- Computer
- Document Camera
- Overhead Projector

Real-world connection / focus / word problem connecting lesson to real-world: (What is the connection between this content and a student's future study or the "real world"? What is the context of this lesson? What problem will you use to hook students into the lesson to make a real-world connection to content that they are going to learn today?)

Daisy wants to enroll in a gym, but she to begin by selecting a membership plan. With plans #1, she can pay \$24 a month, plus \$5 per class for each class she chooses to attend. Plan #2 costs \$40 per month and a per class fee of \$1. When will the two membership plans cost the same amount of money? What is that total amount? How many classes per month make the two plans equivalent? If she wants to attend 2 classes per week, which plan is cheaper?

What if a third plan option is \$50 per month for unlimited classes? Which plan is best if she consistently goes to 8 classes per month?

How are you using this context to introduce or reinforce the teaching point?

The students will set up the first two plan options and answer the questions. Then they will compare the third option, and determine which plan works best for Daisy and her gym routine.

Anticipated time	Stage and aim	Procedure
15 – 20 mins.	<p>Students will learn how to solve systems of equations using substitution. They will be able to algebraically determine if a system of equations has only one solution “unique,” infinitely many solutions or no solution.</p>	<p>I will start the lesson by placing the three plan options on the board. I will then ask the class who thinks option 1 is the best, and choose one of those students to represent the group. I will ask the class who thinks option 2 is the most beneficial, and choose one representative from that group and finally I will ask who thinks option 3 is the most favorable, and choose a representative from that group. These will be the 3 initial participants in our variation of the fishbowl experiment. These three students will each explain why they think their answer is correct and then ask the other participants questions about their choices. Up to three other students from the “audience” can join the group at the front of the room, and they can semi debate for a couple of minutes. They will all be open to questions and remarks from the “audience.” I will be walking around the room seeing if anyone or any group, need help, and if I see that the students in the front, “the core group” are getting off track, I will ask a leading question or two to bring them back. We will do this for about 10 minutes, and a student from the “core group” will go to the board to explain to us how they arrived at their solution. I will then go to the board and rephrase and answer questions if necessary.</p>
10 – 15 mins.		<p>As a group, from the comments and questions presented to the “core group,” we will work out the alternatives together, using the method of substitution.</p> <p>Now that the three option problem were ripped apart and presented, I will explain the</p>

procedure outlining the steps to solve ANY linear system using substitution.

As we approaching the end of this part of the lesson, the students are ready to work on the problems below that I will put on the board. They can work independently, in pairs or in groups as they wish.

$$y = -3x + 3 \text{ and } y = 2x - 7$$

$$3x + 2y = 10 \text{ and } 2x + 6y = 2$$

$$5x - 4y = 10 \text{ and } 10x - 8y = 24$$

Those students choosing the group format will be divided into 3 groups and each group will work on one of the above systems of equations using the substitution method only, no graphing right now, while I walk around the room to see if anyone needs any extra help.

When the students are done, I will choose a representative from each group to come to the board to share their process and solutions, if a solution exists.

The first two group's system of equations will have a unique solution, the third group will have no solution. If time permits, I will give them a problem that has infinitely many solutions, such as:

$$2x - 3y = 6 \text{ and } 4x = 6y + 12.$$

If we are running short on time, I will do this problem and explain, that we do it the same way that we did the others, we will just get a different looking solution.

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Anticipated problems and potential solutions in this lesson (These can be either problems with logistics / timing, or problems to anticipate with students' knowledge / grasp of the content. Where will students have difficulties? What would you want a newer teacher to anticipate?)

The only problems that I anticipate is if students still have a problems with signed numbers or any other material from the preceding course, or not fully grasping the solving of linear equations from chapter 3.

Differentiation: In what places in the lesson are you differentiating for students in different ability groups?

While splitting into groups and walking around while they are working to offer extra assistance where necessary.

Where are these on your lesson plan?

Throughout the entire lesson.

Ideas for extensions, notes, considerations, or alternative plans: