

TITLE OF LESSON

Algebra 1 Unit 1 Lesson 10 – The Play
You Do Speak Math: Creation of the Individual

TIME ESTIMATE FOR THIS LESSON

One class period (The second of 9)

ALIGNMENT WITH STANDARDS

California – Algebra 1:

5.0 Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification of each step.

16.0 Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions.

MATERIALS

Musical Rubric – Student Page

Checklist for Concepts in Algebra 1 Unit 1 – Student Page

Whatever materials you think students may want to begin to design their plays. Probably the items below will be enough for now. Have them start to think about what they'll need to design the set.

Pens

Paper

Markers, colored pencils

Rulers

CD/tape player (Computer with CD drive)

LESSON OBJECTIVES

- To improve teamwork skills
 - To use imagination and generate ideas for each of the perspectives on the play
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EXPLANATION OF LESSON

We will divide the class up into the various groups to work on the different aspects of the play. This should be a lot of fun. We want the students to be excited about creating some music, doing some dancing, writing some dialogue, while at the same time learning some math.

FOCUS AND MOTIVATE STUDENTS

- 1) Homework Check – Stamp/initial complete homework assignments. Pass back graded work and have students place in their folders.
- 2) [Agenda](#) – Have students copy the agenda you have posted.
- 3) Rubric Design – Students will be introduced to the rubric for their project. Some students may not have seen rubrics before. Give students the freedom to voice concerns or to make suggestions on how to change the rubric, if you wish. Explain that technically, a rubric is a table of sorts, but in education, it's a table that's used for assessments. It's a more complete and understandable means of assessing work because it isolates the categories of the work that will be assessed and spells out how they will be assessed. They may have used rubrics before for essays and peer evaluations.

Rubrics are like the tables and graphs they've done in spreadsheets in that they (tables) have two axes of information. The left axis tells you *the individual components of the project that are being assessed*. The top tells you *out of what possible score or grade*. The cells, then tell you what level of skill is required

(row) for that component to merit that grade (column). This may seem obvious, but it is not obvious to all students and will help all students as they learn to make their own rubrics. It is one thing to read and understand something. It takes an entirely different set of skills to create something on your own.

Make sure all students know that this is how their projects will be graded. Here are the categories from this project that will have to be assessed.

- Working in groups
- Musical content of play
- Dance content of play
- Stage design
- Plot
- Dialogue
- All Math Concepts Covered in Unit 1

Print out the **Musical Rubric** and go over the various categories with them. Field questions from students. You may want to create a poster size Musical Rubric and leave it posted in the room so that when students work on their musical, they can easily access the criteria for the grade they are trying to earn.

ACTIVITIES – INDIVIDUAL AND GROUP

1. **Checklist of Concepts for Algebra 1 Unit 1** – Post this on an overhead or hand out copies to students. Explain to them that each week they will be learning these concepts. It is their responsibility to make sure that they insert them into their musical as they learn them. They may want to make sure that their equations work in musical form and have you and their group members check them.
2. **Review: The Musical** – Start with a review of what went on in Lesson 5, their first day of creating the play. Using their notes if they need them, have them review as many of the ideas as they can remember regarding the play.
3. **Adding and Subtracting Negatives** – Review the homework assignment from Lesson 5 by asking for volunteers to read what they came up with. Discuss the idea of repetition and how patterns help us categorize and remember. Ask students if they believe dancers and musicians learn and memorize each step in a dance or each note in a song individually. Talk about the dance steps as variables. Can you add and subtract steps to and/or from a dance? What would be the difference between subtracting a step and adding a negative version of the same step? (The idea here could be that subtracting might mean removing one step or set of steps, while adding a negative might mean adding a step or series of steps but in the reverse order.) How might you add a negative dance step? Is there a difference between subtracting and adding a negative? Encourage them to be as creative as possible. It will probably make it easier to have the discussion if students are up moving around, trying to act out the ideas.
4. **Demonstrations** – As students give you answers to your questions, ask them to show you what they mean. If they're too shy, ask if another student thinks he or she can act out what the other student is saying. Can they speak to each other in math? Can they understand and make use of the information the other students are giving them? Hey! They're talking Algebra! Point this out to them. Ask if someone can write the equation on the board using words. (Tell them to write their own equation in their notebooks as you're having this discussion. That will encourage the shier or more introverted to participate on their terms. Circulate and look at the notebooks asking students to share if they feel comfortable. Remember building a classroom of support – have fellow students encourage also.)
5. **Words to Variables** – Can someone else transfer the words into variables so they've written an equation? (An example – ONLY an example!! – might be that they make up a set of dance steps made up of 5 steps. To this they add the same set. To this they add a negative version of the same set, so they start with step 5 and work back to step one. They might add one more negative version of the set. The equation might look something like

this, where S = the Set of steps; and T = the Series of sets. $S + S + (- S) + (- S) = T$. The next series could be the same, minus one S , and could be written $T - S$. They might want to clarify this, though and specify where the S will be dropped. Have them play around with writing what their classmates are doing. Ask how they might write the equation if they wanted to remove one or more steps from the set of steps. What would they have to change?)

NOTE: One way to help students who are having trouble visualizing this is to put a grid (of tape or paint) on the floor. You can label an X axis and a Y axis and ask students to start at the intersection and consider each series of steps in terms of how, how far, and in which direction(s) they move from the starting point. A good way to get them started is to have them take the first series of steps out, then reverse the steps with the intention of ending up back at the starting point. This experience will help all students as they move into more complex algebra and geometry.

6. Communicating Ideas – Can they make these steps, these equations mean something else? When they watch a musical or a music video, do the steps/dances seem to be communicating ideas? That’s where their play comes in.
 7. Class Musical Instructions – Explain that today’s task will be to come up with a song, some dialogue, some dance steps, and some description of how the scenes, or at least the first scene, will work in their class play.
 8. Organization and Division of Work – If they decide, at any point, that each group would rather do its own play, even perhaps turn it into a competition, let them go ahead. In the mean time, you will need to get everyone started before they break into groups. Help out with some direction on how they might organize. Have someone in each group be the recorder of what goes on (see *Group Roles* for examples). They can decide as a group if they want the recorder to record in variables or in words. Each group will do some brainstorming on it own. Be sure to emphasize that there must be something about math in each group’s portion of the play.
 9. Presenting – They should be prepared to begin the next Friday’s class, Lesson 15, with a quick presentation to the class so they can work together to mesh the parts. If they have decided to do small group plays and compete for the best play, you can skip this part so the first time they really see one another’s plays is at the final competition.
 10. Homework Review – No homework unless groups would like to get together outside of class to work on their musical.
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GROUP ROLES

Recorder – The Recorder will record the group’s ideas.

Facilitator – The Facilitator will keep group members focused on the activity.

Illustrator – The Illustrator will illustrate any ideas the group feels need to be illustrated.

Manager – The Manager is responsible for getting materials the group needs.

DOCUMENTATION FOR PORTFOLIO

None