

TITLE OF LESSON

Algebra 1 Unit 1 Lesson 17 – Equations with forms:  $X + X$ ,  $2X$ ,  $X + X + X$ ,  $3X$   
*You Do Speak Math: Creation of the Individual*

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TIME ESTIMATE FOR THIS LESSON

One class period

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ALIGNMENT WITH STANDARDS

California – Algebra 1:

**4.0** Students simplify expressions before solving linear equations and inequalities in one variable, such as  $3(2x-5) + 4(x-2) = 12$ .

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MATERIALS

**Lesson 17 Homework** – Student Page

**Lesson 17 Homework Key** – Teacher Page

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LESSON OBJECTIVES

- To introduce equations with forms:  $X + X$ ,  $2X$ ,  $X + X + X$ ,  $3X$
  - To relate these forms to examples in the world
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EXPLANATION OF LESSON

We will introduce various forms of equations and seek out examples from the world that mimic these forms.

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FOCUS AND MOTIVATE STUDENTS

- 1) Homework Check – Stamp/initial complete homework assignments. Pass back graded work and have students place in folders.
  - 2) [Agenda](#) – Have students copy the agenda you posted.
  - 3) Volume Intro – Ask students to think back to the discussion of volume and what 3 means or 7. These are variables we use to describe volume. Can you add the volume of one thing to the volume of something else? If you add the volume 7 to the volume 3, how loud would that be? It would be a 10. This is only in relation to the music and the equipment you are using to play it, but everyone understands that 10 is louder than 3 or 7. The idea here is that, even though we're talking about volume, we can add it. We're not adding 3 to 7 to get \$10. We're getting an *idea* of how loud something is. They've been doing this with their plays, adding steps to one another to form a dance. Today we're going to start looking at how we can add and subtract, then, eventually, multiply and divide variables, keeping in mind all the time, that sometimes what we're working with will be numbers, but sometimes, not.
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ACTIVITIES – INDIVIDUAL AND GROUP

1. Discuss: Addition of Variables – Lead a discussion on the addition of variables. Relate this to the lives of the students by seeking examples in their lives. For instance, we can add the volume of one drum with the volume of another drum together to obtain  $X + X$  where  $X$  is the volume of one drum playing alone and  $X + X$  is, then one, plus one more, hence two drums. Look for examples in other realms such as the darkness of a drawing of the length of a movement or the speed of the movement.
2. Forms of Equations – Explain that in algebra, we can write this another way. Ask students to label a page in their notebooks *Forms of Equations*. Tell them they're going to be learning a number of different forms equations can take and as they learn each, they should add it to this list. Under the heading, have them write:  $X + X = 2X$ . Ask if they believe this equation. If we use the drum example from above, is the volume of one drum

(X) plus the volume of the other drum (X) equal to two times the volume of one drum? Discuss this. If they agree immediately, move on to step 3. If not, let them work through it. Ask for other examples from the students.

3. Disprove – Once they agree that  $X + X = 2X$  (or at least accept the possibility that it works) ask them to try to think of an example for which this wouldn't work. Give them 2 or 3 minutes to try to think of things. They should write ideas down in their notebooks. Discuss what they've come up with. They should try to defend their ideas. Explain that you were challenging them to think. They probably didn't come up with any examples for which this really wouldn't work, but they thought about it for a while and that's the point. Ask them: How can you prove anything if you never try to disprove it?
  4. Third Drum – When you finish that discussion, ask them to look back at  $X + X = 2X$ . What would happen if you added a third drum? Give them 2 or 3 minutes to write down in their notebooks what they think would happen to the equation. Tell them this one is possible!
  5. Present and Discuss – Ask for their ideas. Ask one or more students to write their equations on the board. Discuss. When you've decided, write  $X + X + X = 3X$  on the board and make sure all students have it in their notebooks under *Forms of Equations*. (You might want to come up with a class abbreviation – variable? – for this; maybe FoE.)
  6. Solve – Now, place a value on X and begin to solve the equations you have on the board. Ask what the answer would be if we were looking at  $3X$  or  $4X$ .
  7. Homework Review – Hand out **Homework Lesson 17**, due tomorrow. This will help them with their play as they develop it. Field questions.
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#### HOMEWORK

- 1) Seek out 5 additional examples in your life. Represent these examples in algebraic notation. Attribute a value to your variables and calculate the answer.
  - 2) Complete **Homework Lesson 17**, due tomorrow.
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#### GROUP ROLES

Students will work as individuals in today's class.

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#### DOCUMENTATION FOR PORTFOLIO

None