

NOTE: Please make sure you have signed up for the computer lab for the following lessons: 3, 14, 24, and 34.

TITLE OF LESSON

Algebra 1 Unit 1 Lesson 1 – Welcome/Introduction; Assessment, Part 1
You Do Speak Math: Creation of the Individual

TIME ESTIMATE FOR THIS LESSON

One class period

ALIGNMENT WITH STANDARDS

California – Algebra 1:

1.0 Students identify and use the arithmetic properties of subsets of integers and rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where applicable:

1.1 Students use properties of numbers to demonstrate whether assertions are true or false.

2.0 Students understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. They understand and use the rules of exponents.

3.0 Students solve equations and inequalities involving absolute values.

MATERIALS

The materials listed in this section of each lesson include both the suggested and the necessary materials. If you don't have access to some of the necessary materials, that's where your teacher adaptability skills come in. At no time do our lessons demand that you use a specific anything. If you do not have, cannot or will not buy or make, and in no other way have access to something, use your creativity to come up with something else. For example, if we recommend a drum but you don't have one, you can probably find a bucket that would serve just as well. If you can't think of something, I bet your students can!

Algebra Sample Syllabus – Teacher Page (use this to create your own syllabus for the students)

Index cards to use as information cards

Pens

Paper

Markers, colored pencils

Rulers

CD/tape player (Computer with CD drive) if you'll be playing music

A NOTE ABOUT MUSIC

Some ideas about background music: Our experience has been that students like to hear music in the classroom, even if it's "old people's" music. We have yet to find anything the students would rather **not** hear. You know your students. So go with whatever you think will work. We don't recommend specific music for each lesson, but we do recommend that you have music on in the classroom whenever possible. The musical learner is not always the student who sings or plays an instrument. Sometimes it's as simple as a student who learns better – significantly better – when there is music or some form of rhythm or beat in the background.

LESSON OBJECTIVES

- To establish a classroom atmosphere that makes students feel comfortable about learning math
 - To let the students know that there are many ways of learning and that each style of learning is valid
 - To give students an understanding that they already use mathematics in every day life
 - To promote group learning
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EXPLANATION OF LESSON

The first days should be used to describe how math exists in the world. You're going to ask students to talk about experiences they have and have had related to mathematics. We will introduce art, music, movement, and spatial qualities of mathematics in bringing out some of the central concepts of algebra.

FOCUS AND MOTIVATE STUDENTS – WARM-UP ACTIVITY

Because students often have math apprehension, the focus of the first week is to create an atmosphere where all students have an opportunity to thrive. We want to create a classroom that is known to be a math classroom and also known to be fun and exciting. There should be posters, books, instruments, sheet music, slide rules, calculators, abacuses, and games as well as equations and numbers prominently displayed throughout the classroom. The idea is not to make your classroom look like a game room, but to make it look familiar to students. If students begin to think of math as part of their lives, not some strange foreign language, they are more inclined to learn it. Plus, these tools will aid us in identifying and encouraging those of each learning style.

ACTIVITIES – INDIVIDUAL AND GROUP

1. **Course Syllabus** – We begin by setting the rules and expectations for the class. We need to impress on the students that this will be an enjoyable and fun class where all ways of learning will be valued. They will be expected to treat each other with respect and to work together as a group for much of the class. Pass out the course syllabus you have created and review it with the students.
2. **Real World Math Brainstorm** – Ask students to talk about math in the world. Where do they see math and what does it mean to them. Do they have any positive experiences that they can relate to others? Do they know anyone who uses math? You may want to lead the discussion into certain areas. Whenever you start a brainstorming type discussion with a new class, particularly freshmen, they may answer a few things then think they're finished. A big part of your role here will be to keep prompting them with whatever comes to your mind to encourage them to think of more and more things. Many high school students, and, again, most freshmen, haven't yet learned to make associations and think creatively. Add to that that this is a math class, and you're going to completely stagger them. Let them know you're not trying to put them on the spot; that's why you're asking them questions to give them ideas of other associations they may not have thought of.

There clearly are areas where math is used and familiar to students. Money and sports are obvious places. Try to bring out things related to music, art, dancing, and movement. Ask them how they use math when they shop. How does math figure into sports? Have them think about score keeping, RBIs (Runs batted in), percentages, downs (in football), yardage, the effect of the wind in golf, half court press and other play formations in basketball, box scores in the paper – statistics in general.

Have any of them ever studied an instrument? Can they read music? If you're familiar with music, you can go over this with them. If not, if one of your students is, ask him or her to explain notes, octaves, chords, 1/2 notes, 1/4 notes, and so on. The point is not to actually do the math for all of these, but to have the students realize that they do math every day. They already know how to talk about the effect the wind has on how a golfer will play, about the fact that players sometimes have to play into the wind, sometimes against it, and that the force of the wind will affect how far the ball will travel.

Do any of them cook? Are they familiar with measurements? Where else in life do they deal with fractions? Do any of them ever take the bus? How do they decide when to leave or how long it will take them to get somewhere?

3. **Math Questions** – From here, ask some provocative math questions. What is the biggest number? What is the smallest number? Can a number be fun? How? Who can draw a picture of a number? Who can sing or play a number? Who can dance a number? (We're not sure what this actually means, but Einstein knew what it meant to ride on a light beam by the time he was the age of our students. We might get some really good answers.) The idea is to promote creative and fun and varied thinking about math. Use your judgment here. Are your students looking at you as though they're afraid for your sanity? If they are, ask them why? How are they

accustomed to talking and thinking about math?

4. Mini Lecture: The Language of Math – Point out to them that they have been talking and thinking about math now for _____ (however long you’ve been doing this.) Did they think, when you first asked them how they see math in their lives, that they would be able to come up with this much? Explain that math is a language and that we use it to communicate information – statistics about an athlete’s record tell us how well he or she is doing this year, for example. When some of us look at box scores, we get information about the current standing of teams and athletes. For others, we see a bunch of numbers on a page. Lots of numbers! It looks confusing and may not look very interesting. This same person may look at a catalogue from _____ (The Gap, Eddie Bauer, etc.) and all of a sudden the numbers make perfect sense. Now try looking at the stock pages in the paper. How many students understand those? We all have our own math dialect, based on our experiences, but it’s still the same language – math – that we’re speaking. What we’re going to be working on this year is getting the foundation down so that we can all talk to one another about and *in* the language of math. Our focus this year will be the concepts involved in algebra, one branch of math, but we’ll also be looking at arithmetic and geometry, since they are all interrelated.
5. Student Information – Hand out information cards and write on the board that you’d like them to give you the following information:

Name	Hobbies
Address	Instruments they play
Home phone	Sports they like
Parents'/Guardians' names	Favorite number
Birthday (Only ask for this if you do something for students' birthdays.)	Any other information you'd like from them

6. **Portfolio**, Class, and Group Folders – Once they’ve finished their information cards, explain that you’ll be using the portfolio method of evaluation. For this class, they’ll be responsible for keeping two folders: one they’ll use to collect their finest achievements in each area, and one for them to monitor their growth. The first will be their actual portfolio, what’s known as a portfolio (see Teaching Strategies for an explanation). The second, will be their classroom folder. This year, their first, they’ll begin to learn the responsibility of keeping and organizing their work, but they will keep everything in the classroom. Beginning with their sophomore year, they will keep a binder that they take home with them. But for their freshman year, while they learn responsibility for their own work, they’ll put their papers into their classroom folders at the end of each class (unless they’re turning something in), and be responsible for not losing or misplacing anything.

NOTE: They will have access to any missed work or worksheets from home via the Internet. (FYI: Today almost all public libraries offer free Internet access. No access is not an excuse. You may want to offer some form of credit to students for having/getting a library card.) Students will also be using group folders for all of their group work. These are separate and they are responsible for keeping their work in the appropriate folder.

7. Personalize Class Folders – Hand out the folders they’ll use as their classroom folders, with markers, colored pencils, etc. and have them personalize their folders. Be sure their first and last names are on the folder’s tab. This will give you an idea of who likes to draw, who’s got artistic skills, graffiti skills, etc.
8. Homework Review – Go over the homework assignment with students.

HOMEWORK

- 1) Get syllabus signed and return tomorrow.
- 2) Create a one-minute method of telling the class what your favorite number is. “I don’t have a favorite number!” “Okay, so if \$10 million dollars showed up at your door, you wouldn’t let it in?” The number can be in the context of something else—a perfect 10 in the Olympics, for example—or it can be completely abstract. The one-minute presentation can be a list, a mathematical formula, a poem, a song, a drawing, a symbol, a treasured possession, etc.

Note: The numbers, symbols, and contexts each student chooses will help you understand how each looks at math. In class tomorrow, all students will share a small piece of themselves. You can let any extremely shy or anti-social students know that, because this is the first day of class, they can try to think of a creative way to express themselves without having to actually stand in front of the class and speak. If their creation isn't self-explanatory enough, though, they'd better be prepared to talk!

GROUP ROLES

Students will be working individually during this class period, unless a student needs help.

DOCUMENTATION FOR PORTFOLIO

None