48. Mathematics as a Language

Objectives: 1. To make mathematics terminology easier for students to learn and understand.

2. To relate mathematics to language and to recognize roots in new words.

Materials: A class set of dictionaries, reference books on the history of words (optional)

Procedure: Many of our mathematical words are strange and meaningless to junior high school students. If we can relate these words to their roots, we can help the students to better understand the words, to enrich their vocabulary, and to coordinate mathematics with language (and health, human sexuality, religion, and so on).

Some common words I focus on are: monopoly, digit, invert, reciprocate, commute.

Following are some interesting words (not all mathematical) that I use to stimulate students' interest in words:

equator—equal distance from the poles

pupil—means small; the pupil in the eye reflects small images; the pupil in school starts off small

decimate—when the Romans conquered a town, they established their power by killing every tenth male

gymnasium—from the Greek word *gymnos*, "to train naked"

trapezoid—Euclid used *trapezion*, meaning "little table"

Tory—from the Irish word *toruidhe*, meaning "robber"

September, October, November, December—the Roman calendar started in March

mortgage—dead pledge; the land is taken away and is dead to the mortgagor forever

quintessence—the ancients believed in 4 main elements; the "ether" was number 5, which Aristotle associated with the sun, the moon, and the stars

Be prepared to handle such words as:

hyperactive—too active

hyperbole—exaggeration (too much)

heterosexual—interested in the other sex

mononucleosis—one nucleus (Red blood cells should have no nucleus. If they have one, they don't transport oxygen as they should.)

bisexual—two sexes

bible—two books

transvestite—clothing "across" the sexes

You can research words of your choosing. A sample assignment follows.

Math Word Roots and Prefixes

1. Each of the roots or prefixes below has a meaning that is carried over into several other words.

   (a) List 3 nonmathematical words that use the prefixes below.

   (b) State how they are related to the meaning given.

   (c) Use each properly in a sentence.

   (d) From what language did they originate?

mono-	one	deci-	ten
bi-	two	circum-	around
tri-	three	dia-	across
quad-, quat-	four	peri-	around
quint-	five	equi-	equal
poly-	many or several	hetero-	other
sept-, hept-	seven	hyper-	too much
oct-	eight	inter-	between, among
deca-	ten	trans-	across

2. From the list below, relate each word (or its root) to mathematical and nonmathematical usage.

digit	lateral	identity	base
commute	invert	reciprocate	
associate	distribute	denominator	

3. (a) Find the words below in the reference books suggested.

   (b) Briefly describe in *your own words* the history of 3 words from the following lists.

   (c) From the lists below, pick any 2 words that you find particularly interesting, and describe their history. (These words should be different from those of other students in your group.)

Thereby Hangs a Tale by C. Funk		*Word Origins and Their Romantic Stories* by W. Funk	
calculate	piano	algebra	intersect
camera	post	pupil	minus
caucus	salary	add	null
money	school	decadence	perimeter
gymnasium	trapezoid	decimate	quintessence
mortgage	Tory	decision	quart
one	volume	square	quarantine
pencil		hyper	subject
		integer	