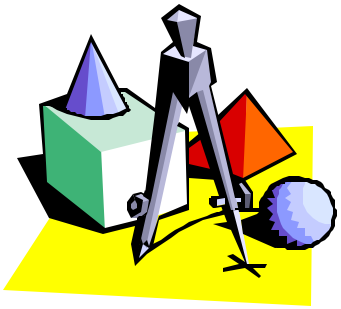
Algebra/Geometry Institute Summer 2003

Lesson Plan 1



Faculty Name: Patansy Miller
School: Solomon Middle School
City: Greenville, MS
Grade Level: 7th

1 Teaching objective(s)

Objectives- The student will translate between simple algebraic expressions and verbal phrases.

2 Instructional Activities

1. The teacher will divide the students in groups of three's. Each group of students needs a watch or clock with a second hand. The teacher will instruct the students to find the number of times your heart beats in fifteen seconds by taking a fifteen-second reading of your pulse. Each beat corresponds to one beat of your heart. The teacher will suggest the student will begin timing their pulse when the second hand is at the 12 or 6, rather than at an irregular point on the clock. The teacher will also suggest the inside of the wrist and the side of the neck is good places to take a pulse.

2. The student will record each person in the group's fifteen –second rate. They will also calculate the beats per minute.

3. The teacher will instruct the student to use the heart rates to answer the following questions: a. How many times would each person's heart beat in 5 minutes? In 1 day? In 1 week?

4. The student will calculate the answers to the above questions and explain how they found the expected number of heartbeats in 5 minutes and in 1 day.

5. The teacher will introduce the vocabulary words *variable* (a symbol that stands for a number) and *variable expression* (a group of numbers, variables, and operations). The teacher will discuss how you can use a variable expression to describe data by using the example below.

6. Given a hypothetical situation, suppose your heart rate beats 72 times in one minute. The variable expression $72m$ will be used to represent the data with 72 representing number of beats in one minute and the variable m representing the number of

minutes. The operation being performed is multiplication. The student will evaluate the expression by replacing the variable with a number.

7. The teacher will explain that we write variables in italics and unit abbreviations in regular type: 15*s* means 15 times the variable; 15 *s* means 15 seconds.

8. The teacher will show a table showing some of the key words you can use in word phrases for variable expressions.

Key words	Operation
Add	+
Plus	+
Sum	+
Total	+
Increased by	+
More than	+
Product	x
Times	x
Multiply	x
Minus	-
Difference	-
Subtract	-
Less than	-
Less	-
Decreased by	-
Quotient	÷
Divide	÷

10. The teacher will demonstrate three ways you can write a word phrase for $x + 2$:
    a. a number plus two
    b. the sum of two and a number
    c. a number increased by two

11. The teacher will encourage students having problems with the vocabulary to copy the chart onto a note card for future reference. They may want to color code the words that represent the different operations.

12. The student may write subtraction expressions in the wrong order, for example, if the word expression states *a number subtracted from 10*, the student might give *x-10* for the answer. In order to prevent this error, the teacher will have students substitute a number for each variable to see if the expression makes sense. It may also be helpful for some students to circle the variable when they see it in a word phrase. The circle will signal students to reverse the order of the terms when writing the variable expression.

13. The teacher will ask students to use 5 and *d* to write four variable expressions using the four operations. Then the students will rewrite the variable expressions as word

phrases. Students will also evaluate the expressions using $d = 4$. The teacher will also give other examples such as 15 and x, 1.5 and y, 65 and with the same instructions and assigning all variables the value of 5.

3 Materials and Resources

Pencil
Notebook
Textbook-Mathematics-Applications and Connections, Course (Glencoe, 1995)
Watch/clock
Chart/table

4 Assessment

Teacher observation of student participation
Peer evaluation of heart rates
Student product-rewriting the variable expressions as word phrases