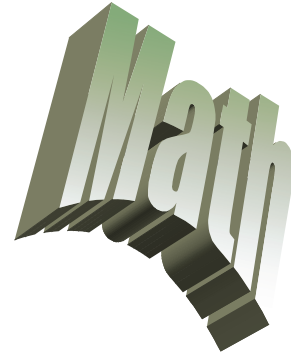# Algebra/Geometry Institute Summer 2005

Lesson Plan One: Ratios

Faculty Name: Steven Thompson
School: McEvans Elementary
Grade Level: 6th

1   Teaching objective(s)

Given ten problems, the students will determine the ratio and/or unit rate with no more than two errors.

2   Instructional Activities

A. Intro/Motivation

Tell students that today, we will learn about ratios.
- Inform students that by the end of the day, they will be able to write ratios in simplest form, and determine the unit rate for ratios.
- Tell students that I am very excited about the unit because math is important and used in everyday life.
  - Ask students if they can think of ways we may use percents or ratios in today's world.
  - Allow time for the students to brainstorm.
  - Tell students that we use ratios in the classroom when we compare the number of boys to the number of girls. Inform the students that we also use ratios when we determine the number of students per teacher or classroom.

B. Study Learning
  1. Ask the students if we have enough boys and girls in the room to sit boy, girl, boy, girl, and so on.
     - Allow the students to respond.
     - Ask the students how many students are in the room. Write the number of students on the board.
  - Ask the students to count the number of girls that are in the room and write the number on the board. Do the same thing for the number of boys.
  2. Tell the class to look at the information on the board and write a fraction for the number of girls in the class (# of girls/ # of students) and a fraction for the boys in the class (# of boys/ # of students).
     - Inform the students that the fractions they wrote are called ratios.

3. Use the overhead projector and display notes on ratios and unit
   rates.
   - Inform the students to take notes as I talk about ratios.
   - Tell the students that a ratio compares two numbers by division.
   - Inform students that a ratio compares a part to its whole or a
     part to another part.
4. Ask students to tell the ratio of teachers to students in the classroom.
   - Tell the students to first, write what they are comparing in
     fraction form, for example, teachers/number of students.
   - Tell the students that there are two teachers in the classroom and
     twenty-eight students, therefore, the ratio is 2/28.
   - Tell the students that a ratio can be written several ways: 2 to 28, 2:28, as a
     fraction.
5. Put more examples on the board.
   - examples: 8 circles to 2 triangle, 3circles to 4 squares, 5 circles to 5 squares.
   - Allow the student to help determine the ratio.
   - Tell the students if they have four stars and seven circles, then
     the ratio would by 4:7, 4/7, or 4 to 7.
   - Allow the students to help determine the ratio of the other
     examples.
6. Tell students that sometimes, we have to write the ratio in simplest
   form.
- Tell the students that writing a ratio in simplest form is just the
     same as writing a fraction in simplest form. Divide each part of the ratio by greatest
     common factor. For example, the ratio of 2/28 can
     be written in simplest form by saying 2 will go into 2 one time
     and 2 will go into 28 fourteen times.
   - Put more examples of simplifying ratios on the board. Work each
     one of them step by step.
   - Examples: 32:20, 14 to 16, 18/42, 15:33, 66/46, 14/9
   - Ask the students if they have any questions about simplifying
     ratios.
7. Tell the students that sometimes we have to find equal ratios. Tell students that equal
   ratios are two ratios that have the same value such as 1/4 and 2/8. Inform the
   students that we can determine if ratios are equal by putting them in simplest form.
8. Ask students if they remember when we converted metric and
   customary measurements.
   - Tell the students that 12 inches to 1 foot is a ratio because for
     every foot, there are 12 inches.
   - Tell students that we call these types of ratios unit rates because
     it compares a quantity to a unit of one such as inches and feet.
   - Go over the difference between rates and unit rates. Put examples
     of unit rates on the board and work them out for the students.
   - Examples: 302 miles in 2hours, 120 pages in 1 day, 27 calls in 9 hours
   - Ask the students if they have any questions about unit rates.

Guided Practice
1. Have ten note cards with ratios and unit rates on them.
   - Examples: 52 pages in 1 day, 81 seats in 9 rows, 40 calls in 8 hours, 39:48, 16 to 48, 8:18, 12/24, 14 to 8, 6 yellow marbles and 15 purple marbles, 4 blue shirts and 24 green shirts.
   - Tell students that the cards have either a ratio that needs to be simplified, a picture of two or more things, or a unit rate.
   - Tell the students that I am going to call out the ratio or unit rate on the card, and they will have to put it in simplest form.
   - Tell the students that I will call out the items in the pictures, and they will have to give me the ratio between the items.
2. Tell the students to write their answers on notebook paper.
   - Go over the answers on each card with the students. Ask if they have any questions.

Independent Practice
1. Pass out a worksheet to the students. (See Attachment)
   - Tell the students that the sheet will give them more practice with ratios and unit rates.
   - Allow time for completion (ten minutes).
   - Go over the worksheet with the students. Ask the students if they have any questions.

C. Closure/Culmination
   1. Pair the students.
   2. Give each pair of students a bag of beans and a chart.
      - Tell the students that they will have to look on the chart to see which beans they must compare to find the ratio. For example, they will determine the ratio of pinto beans to lima beans by counting the number of beans.
   3. Allow the students to complete the activity.
      - Go over the chart with the students. Ask if they have any questions.

D. Follow-Up
   1. Tell the students to take everything off their desks.
      - Pass out a quiz to each student. (See Attachment)
      - Inform students that they will have extra time on the quiz.
      - Tell the students to put their papers in the basket on my desk.
      - Inform students that we will be given a chance to view their quizzes tomorrow.

3   Materials and Resources

Throughout this lesson on ratios I will incorporate the use of an overhead projector and pictures that correlate to the material in the lesson. I will also be using note cards, notebook paper, worksheets (Problems provided by http://www.edhelper.com/math/ratios206.htm and http://www.edhelper.com/math/ratios215.htm), a bag of beans, and a chart to record their responses during the culminating activity.

4   Assessment

At the close of the lesson, I will administer a quiz on ratios covering the material that was taught in the lesson.

Name:_____ Date:_____

Worksheet

Write each ratio in simplest form.

1. 21/48

2. 22:26

3. 18/3

4. 52 to 56

5. 60:27

Find the unit rate.

6. 30 seats in a row

7. 4,056 miles in 12 hours

8. 666 pages in 9 days

9. 808 miles in 4 hours

10. 192 pages in 3 days

Quiz

Name:_____   **Date:**_____

Write each ratio three ways. Write your answer in simplest form.

1. 10 black marble and 12 blue marbles

2. 4.white hats and 8 yellow hats

3. 6 bunches of red grapes and 21 bunches of green grapes

4. 125 screws and 300 nails

5. 21 hamburgers and 33 cheeseburgers

Write each ratio in simplest form.

6. 16:8

7. 15/10

8. 20 to 56

9. 60 to 30

10. 26:40

Find the unit rate.

11. 128 seats in 8 rows

12. 67 meters in 1 second

13. 20 calls in 4 hours

14. 378 pages in 3 days

15. 112 meters in 2 seconds

Name: _____   Date: _____

Bag of Beans Activity

Beans	Ratio	Ratio in Simplest Form
Lima Beans & Butter Beans		
Lima Beans & Pinto Beans		
Lima Beans & Great Northern Beans		
Butter Beans & Pinto Beans		
Butter Beans & Great Northern Beans		
Pinto Beans & Great Northern Beans		