CHEMISTRY
The Complete Course

Lesson Two

Quantitative Reasoning in Life and Chemistry, (Part I)

KA8502

Worksheet

Instructors may duplicate the worksheets as needed

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ANSWERS

1. Try to visualize the components of the problem and identify quantities and "this per that" numbers. Think logically about whether the answer should be a large or small quantity or a "this per that" number, in other words use your natural reasoning ability. Use drawings if necessary.

2. A problem, not necessarily related to chemistry, that involves a quantity number and a "this per that" number. For example, 30 students per room "guzinta" 3000 students to give 100 rooms. Multiplication and division are used in "guzinta" problems.

3. For example: there are 20 apples per bag, how many apples are in 11 bags? 220 apples.

4. For example: there are 220 apples divided evenly between 11 bags, how many apples are in each bag? 20 apples per bag.

5. 6 donuts x 12 donuts per dozen = 72 donuts.

6. 4 chocolate donuts

7. 4 donuts per person

8. 20 muffins "guzinta" 12 muffins per dozen
   or 20 ÷ 12 = 1.7 dozen

9. 750 ft

10. 10 telephone poles.

I. VIDEOTAPE FOLLOW-UP QUESTIONS

I. The "students and room" problem, although very simple, illustrates the exact type of quantitative reasoning that is used in solving introductory chemistry problems.
   A. Nevertheless, it often is difficult for students to clearly explain how they reasoned out the answer to the problem even though they have no difficulty whatsoever in utilizing the reasoning.
      1. This problem is a simple example of a "guzinta" problem.
      2. One of our major goals is to learn how to apply the type of reasoning used to solve this problem to actual chemistry problems.

B. There actually are three commonly used approaches to solving problems that involve this type of quantitative relationship.
   1. Some students use a "formula," or "equation."
   2. Some use the "proportion" method.
   3. Some use the "factor-label" approach.
   4. The "students and rooms" problem could have been solved using any of these approaches.
   5. Although any of these approaches can be used, it is not necessary to use any of these approaches to be a successful problem solver.

C. Chemistry problems can usually be solved by an application of simple, "natural" ways of reasoning quantitatively.
   1. There are basically only three ways in which numbers are normally related to one another.
   2. In the next lecture we will take a closer look at these ideas.

II. SUPPLEMENTARY EXERCISES

1. How should you approach a chemistry problem? What does Mr. Cardulla suggest?

2. What does Mr. Cardulla mean by a "guzinta" problem?

3. Make up a "guzinta" problem and solve it.

4. Rewrite the same "guzinta" problem from question 3 such that a different part is unknown.

5. Beth wakes up in the morning and finds 6 dozen donuts on the kitchen table. How many donuts are on the table?

6. Beth counts four chocolate donuts in each box of a dozen donuts. How many chocolate donuts are there in total?

7. How many donuts does each person get to eat if the donuts are divided between 18 people?

8. There are also 20 muffins on the table. How many dozens of muffins are there?

9. There are 15 telephone poles on Jake's street. The telephone poles are evenly spaced by 50 ft. How long is Jake's street?

10. The street next to Jake's is 500 ft long. How many telephone poles are there if they are also evenly spaced by 50 ft?