



NEWSHOUR A NewsHour with Jim Lehrer special for students

EXTRA

## LESSON: A GIGABYTE OF MUSIC, HOW MUCH IS THAT? Student Worksheet

Name \_\_\_\_\_

### Part 1: Review of Theory

1. Change each conversion sentence to two fractions each equal to one. (The first example is worked for you.)

a.  $\$30,000 = 1 \text{ year's pay}$       Ans.  $(\$30,000 / 1 \text{ year}) = (1 \text{ year} / \$30,000) = 1$

b.  $1 \text{ mile} = 5280 \text{ feet}$

c.  $1000 \text{ bytes} = 1 \text{ megabyte}$

d.  $50 \text{ CDs cost } \$19.98$  (Hint: Think " $50 \text{ CDs} = \$19.98$ ")

e.  $15 \text{ prerecorded songs costs } \$15.95$

2a. Explain why  $(1 \text{ km} / 100 \text{ m}) = 1$

b. Why does using this fraction produce exact answers when used in conversion problems?

c. Explain why  $(1 \text{ CD} / \$10.50)$  might not equal 1.

d. Why would the fraction in part c produce only rough estimations?

3. Correct, then solve each problem. (Hint: One fraction is incorrect in each of the following problems.)

a.  $2.5 \text{ m} * (100 \text{ cm} / 1\text{m}) * (1 \text{ cm} / \$2)$

b.  $2 \text{ CDs} * (1 \text{ CD} / 80 \text{ minutes})$

4. Convert to the indicated measurement. Use the following conversions to help you.

1 gigabyte = 1000 megabytes

1 CD = 700 megabytes

1 CD = 80 minutes of playing time

1 song = 2.5 minutes of music

(copied from the label of a package of CDs)

(A typical song lasts from 2 to 3 minutes.

Emphasize that our final answer will be only a rough estimate, but it will help us understand the size of five gigabytes.)

a. 1000 minutes of music = \_\_\_\_\_ CDs

b. 1000 songs = \_\_\_\_\_ CDs

c. 1 gigabyte = \_\_\_\_\_ minutes of music

**Part 2: Solve the problems using the conversion techniques discussed in class. Use the conversions listed in problem 4.**

5. Rhoda has 9 CDs of downloaded music. How many gigabytes does she have?  
\_\_\_\_\_ How many minutes of music? \_\_\_\_\_

6. Xi has 4 CDs of downloaded music. If we estimate that each song is about 2.5 minutes long, how many songs are on his CDs? \_\_\_\_\_

7. Some CD players have 2.5 in. diameter hard drives, which can hold as much as 60 gigabytes of song files. How many blank CDs would it take to record the same amount of music? \_\_\_\_\_

8. According to the Online NewsHour story, "Entertainment Industry Targets Individual Downloaders", "Many of the violators had on average over 1,000 music files on their computers. They could be held accountable for up to \$150,000 per song - but settlements will likely be much less". Suppose each file contains only one song. How much could a person with 1000 files be fined? \_\_\_\_\_ Why are settlements expected to be less?