

How Watery Are You?



The average adult consumes and excretes about $2\frac{1}{2}$ to 3 quarts of water each day.

Equipment/Materials

bathroom scale or similar weighing device	pencil
10 to 12 empty gallon jugs	paper
Choice of Record Sheets 9.1	water

Procedure

The procedure outlined below is for the most simple approach to the mathematical problem. More advanced students may apply algebraic relationships, fractions or decimal equivalents. Select one of the two Record Sheets that fits your students.

1. Have each student in the class weigh himself or herself.
2. Multiply the weight by 2.
3. Divide this answer by 3. This will tell how many pounds of water are in each student's body.
4. A quart of water weighs 2 pounds, so divide your last answer by 2.
5. Four quarts are in a gallon, so divide again by 4.
6. This will tell you how many gallons of water are in student's body.
7. Have each student fill up gallon jugs with water to represent the amount of water in their body.
8. Have students calculate how many pounds of their body is not water. Have students calculate this number as a percent of their body weight.



How Watery Are You?

Handout 1



A fluid loss of more than 10 percent of body weight can be fatal in a young child. For a 10-pound infant, that is only 1 pound!

How can you find out how much water is in your body? If the average person in your age group has a mass of water equal to about $\frac{2}{3}$ (66.66... percent) of his or her body weight, the volume and mass of water can be calculated fairly easily. Let's find out!

1. Weigh yourself on the scale provided and record the weight: _____ pounds

2. Multiply your weight by 2: _____ pounds x 2 = _____ pounds

3. Divide the product from step 2 by 3: _____ ÷ 3 = _____ pounds
(This tells you how many pounds of water are in your body!)

4. Each quart of water weighs approximately 2 pounds (2.08 pounds). The number of quarts of water can be found by dividing the answer from step 3 by 2:
_____ pounds ÷ 2 pounds per quart = _____ quarts

5. To determine the number of US gallons that makes, divide that answer by the number of quarts per gallon (4):
_____ quarts ÷ 4 quarts per gallon = _____ gallons

6. Determine the weight of your body that is not represented by water. (Hint: Subtract the weight that is water from your weight.)
_____ pounds (step 1) - _____ pounds (step 3) = _____ pounds

7. Calculate the percentage of your body that is not water by dividing the answer from step 6 by your total weight and multiplying by 100.
_____ pounds ÷ _____ pounds = _____ x 100 = _____ %.

8. If each person should drink about six to eight glasses (8 fluid ounces each) of water daily, how many quarts of water should you drink each day? (There are 32 fluid ounces in a quart.)
 - a. $6 \times 8 \text{ fl.oz.} =$ _____ fl.oz. b. $8 \times 8 \text{ fl. oz.} =$ _____ fl. oz.
 - _____ or _____ fl.oz. ÷ 32 fl.oz. per quart = _____ or _____ quarts
 - _____ or _____ quarts x 2 pounds per quart = _____ or _____ pounds

How Watery Are You?

Handout 2



A fluid loss of more than 10 percent of body weight can be fatal in a young child. For a 10-pound infant, that is only one pound!

How can you find out about how much water is in your body? If the average person in your age group has a mass of water equal to about 66.66... percent of his or her body weight, the volume and mass of water can be calculated fairly easily. Let's find out!

1. Weigh yourself on the scale provided and record the weight: _____ pounds

2. Multiply your weight by 0.6666...: _____ pounds x 0.6666 = _____ pounds
(This tells you how many pounds of water are in your body!)

3. Since each quart of water weighs approximately 2.08 pounds, the number of quarts of water can be found by dividing the answer from 2 by 2.08:
_____ pounds ÷ 2.08 pounds/quart = _____ quarts

4. The number of US gallons can be determined by dividing the number of quarts by the number of quarts per gallon (4):
_____ quarts ÷ 4 quarts/gallon = _____ gallons

5. Determine the weight of your body not represented by water by subtracting the water weight from the total weight
_____ pounds (total) - _____ pounds (water) = _____ pounds (not water)

6. Calculate the weight of your body not represented by water by multiplying total weight by the percentage of your body not represented by water (100 - 66.66...).
_____ pounds x _____ = _____ pounds (not water)

7. Were these amounts exactly the same? Why not?
(This small difference comes from rounding error. It gets smaller as the decimal is carried to more places.)

8. The recommended daily intake of water is at least 1½ to 2 quarts. A quart contains 32 fluid ounces (16 fl. oz. in a pint). How many 8-fl. oz. glasses of water are required to reach the recommended amount?