


Writing Rules


1. A. Maya has a large 15-liter bucket. She wants to know how many milliliters it can hold. Help Maya by making a function table like this one. Fill in the blank spaces.



| Input Volume in Liters | Output Volume in Milliliters |
|---------------------------|---------------------------------|
| 1 | 1000 |
| 2 | 2000 |
| 5 | 5000 |
| | 10,000 |
| 15 | |

B. Write a rule to find the volume in milliliters when you know the volume in liters.

2. A. Irma has a pitcher labeled 3500 milliliters. She wants to know how many liters the pitcher can hold. Help Irma by making a function table like this one. Fill in the blank spaces.



| Input Volume in Milliliters | Output Volume in Liters |
|--------------------------------|----------------------------|
| 1000 | 1 |
| 1500 | 1.5 |
| 2000 | 2 |
| 2500 | 2.5 |
| 3000 | |
| 3500 | |
| 4000 | |
| 4500 | |

B. Write a rule to find the volume in liters when you know the volume in milliliters.


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3. The students in Mrs. Dewey's class are trying to write the rule to find the volume in quarts when they know the volume in cups.

| Input Volume in Cups | Output Volume in Quarts |
|-------------------------|----------------------------|
| 4 | 1 |
| 8 | 2 |
| 12 | 3 |
| 16 | 4 |
| 20 | 5 |



I think the rule is the volume in cups divided by 4 equals the volume in quarts.




I think the rule is the volume in cups multiplied by 4 equals the volume in quarts.

A. Look at the function table. Test each student's rule. Do you agree with Grace or Michael? Why or why not?


B. Nicholas wants to measure 28 cups of water but has only a 1-quart measure. Use the rule you found in Question 3A to find the volume of water in quarts.

4. The students in Mrs. Dewey's class are trying to write the rule for the total (T) volume of water and marbles in the graduated cylinders in the Volume vs. Number Lab.


| Input N Number of Marbles | Output T Total Volume (cc) |
|---------------------------------|----------------------------------|
| 0 | 25 |
| 1 | 30 |
| 2 | 35 |
| 3 | 40 |
| 5 | 50 |
| N | |



I think the rule is $N + 5 = T$.



I think the rule is $25 + 5 \times N = T$.



I think the rule is $T = 5 \times N$.

What's the rule?

A. Do you agree with Keenya, Roberto, or Irma? Why or why not?

B. What will the total volume be after 10 marbles are added?

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For more practice, complete the *Using Different Units* pages in your Student Activity Book.

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*Answers and/or discussion are included in the lesson.

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Questions 1–4 (SG pp. 569–570)

1. A.* 10 liters = 10,000 milliliters;
15 liters = 15,000 milliliters
- B.* The volume in milliliters equals volume in liters times 1000.

2. A.*

| Input Volume in Milliliters | Output Volume in Liters |
|--------------------------------|----------------------------|
| 1000 | 1 |
| 1500 | 1.5 |
| 2000 | 2 |
| 2500 | 2.5 |
| 3000 | 3 |
| 3500 | 3.5 |
| 4000 | 4 |
| 4500 | 4.5 |

- B.* The volume in liters equals volume in milliliters divided by 1000.

3. A.* I agree with Grace, because when I tested each rule, hers worked. Michael's will not work because I am going from a smaller unit to a larger unit. The number of the larger units should be less than the number of smaller units. If I multiplied the number of cups by 4, the number of quarts would get larger rather than smaller.

- B.* 7 quarts. 28 cups divided by 4 equals 7 quarts.

4. A.* Roberto. $25 + 5 \times N = T$. Keenya's rule does not include the starting water and does not work for all the data in the table; Irma seems to have found the marble size to be 5 cc and that 5 times the number of marbles equals the volume of the marbles, but she forgot the starting water, 25 cc.

- B. 75 cc