



Measurement & Volume Quest

Name: _____

Grade: 5

Date: _____

Convert units, compute rectangular prism volume, compare capacities, and solve real multi-step measurement problems. Show work and label units.

Part 1 · Metric Conversions METRIC

(1. 3 m = _____ cm

(2. 450 cm = _____ m

(3. 5 L = _____ mL

(4. 2,750 mL = _____ L

(5. 8 kg = _____ g

(6. 12,500 g = _____ kg

Part 2 · Customary Conversions CUS

(7. 4 ft = _____ in

(8. 72 in = _____ ft

(9. 5 yd = _____ ft

(10. 3 qt = _____ pt

(11. 16 c = _____ gal

(12. 2 gal = _____ qt

Part 3 · Rectangular Prism Volume VOLUME

(13. $5\text{ cm} \times 3\text{ cm} \times 4\text{ cm} =$ _____
 cm^3

(14. $8\text{ m} \times 2\text{ m} \times 2\text{ m} =$ _____ m^3

15. $10 \text{ in} \times 6 \text{ in} \times 5 \text{ in} = \underline{\hspace{2cm}} \text{ in}^3$

16. Base area 12 m^2 , height $7 \text{ m} \rightarrow$
volume $\underline{\hspace{2cm}} \text{ m}^3$

17. $9 \text{ ft} \times 3 \text{ ft} \times 3 \text{ ft} = \underline{\hspace{2cm}} \text{ ft}^3$

18. Cube edge $6 \text{ cm} \rightarrow$ volume
 $\underline{\hspace{2cm}} \text{ cm}^3$

Part 4 · Volume & Scaling

SCALE

19. Box $4 \times 3 \times 5$. Double only height.
New volume = $\underline{\hspace{2cm}}$

20. Box $2 \times 5 \times 6$. Double every
dimension $\rightarrow$ volume multiplied by
 $\underline{\hspace{2cm}}$ (factor)

21. Original volume 150 in^3 . Double
length only (others same). New
volume = $\underline{\hspace{2cm}} \text{ in}^3$

22. If $l \times w$ grows by factor 3
(height same), volume changes by
factor $\underline{\hspace{2cm}}$

23. Prism $7 \times 4 \times 2$. Increase width
from 4 to 6. Volume change =
 $+\underline{\hspace{2cm}} \text{ units}^3$

24. Scale $3 \times 5 \times 8$ by $1/2$ each
dimension $\rightarrow$ new volume = $\underline{\hspace{2cm}}$

Part 5 · Liquid Capacity & Mass

CAPACITY

25. A 2 L bottle holds how many
 mL ? $\underline{\hspace{2cm}}$

26. A tank has 3.6 L ; add 900 mL .
Total $\text{L} = \underline{\hspace{2cm}}$

27. $4 \text{ cups milk} = \underline{\hspace{2cm}} \text{ pints}$

28. $3 \text{ pt} = \underline{\hspace{2cm}} \text{ quarts}$

29. $24 \text{ oz} = \underline{\hspace{2cm}} \text{ lb}$ ($16 \text{ oz} = 1 \text{ lb}$)

30. $5.5 \text{ kg} = \underline{\hspace{2cm}} \text{ g}$

Part 6 · Mixed Word Problems

REAL

CRATE 31. A crate $6 \times 4 \times 5$ ft holds boxes each $2 \times 2 \times 1$ ft. How many boxes fit (fill perfectly)? _____

AQUARIUM 32. Tank: $80 \text{ cm} \times 30 \text{ cm} \times 40 \text{ cm}$. Volume = _____ cm^3 (convert to liters /1000) = _____ L

JUICE 33. 1.5 L pitcher: poured 350 mL + 0.4 L + 125 mL. Space left (mL) = _____

GARDEN SOIL 34. Raised bed $3 \text{ m} \times 2 \text{ m} \times 0.4 \text{ m}$. Soil volume = _____ m^3 (convert to L $\times 1000$) = _____ L

STORAGE 35. Two prisms: A $5 \times 3 \times 4$; B $4 \times 4 \times 5$. Which larger volume? _____ (show numbers)

TRUCKLOAD 36. Truck can haul 8,000 kg. Three loads: 2,450 kg + 3,325 kg + 1,990 kg. Capacity left (kg) = _____

Part 7 · Error Analysis & Reasoning FIX

37. Error: Student says $2,750 \text{ mL} = 2.75 \text{ L} = 2,750 \text{ L}$. Correct conversion & brief mistake note: _____ / _____

38. Error: Volume $5 \times 3 \times 4 = 5 + 3 + 4 = 12$. Correct volume & mistake: _____ / _____

39. Chose $4 \times 3 \times 10 = 70$ (rounded wrongly). Correct product = _____ ; percent error $\approx$ _____ %

Part 8 · Multi-Step Challenge CHALLENGE

40. A shipping box $12 \times 10 \times 8$ in. Smaller product fits $6 \times 5 \times 4$ in. How many small boxes fit (perfect pack)? _____

41. Convert leftover from #33 space (mL) to L = _____ L

42. Prism with volume 864 cm^3 , base $12 \text{ cm} \times 9 \text{ cm}$. Height = _____ cm

43. Increase all dims of $4 \times 3 \times 2$ by 25%. New volume = _____ (to nearest whole)

44. Tank $1 \text{ m} \times 0.5 \text{ m} \times 0.4 \text{ m}$ fills at 2 L/min. Fill time (min) = _____

45. Reflection: Easiest skill today? _____

Answer Key

1. 300
2. 4.5
3. 5,000
4. 2.75
5. 8,000
6. 12.5
7. 48
8. 6
9. 15
10. 6 pt
11. 1 gal (16 c)
12. 8 qt
13. 60
14. 32
15. 300
16. 84
17. 81
18. 216
19. $4 \times 3 \times 10 = 120$ (orig 60; doubled height) $\Rightarrow 120$
20. Factor $2^3 = 8$
21. 300
22. 3
23. 56 (from $7 \times 4 \times 2 = 56$ minus old $7 \times 4 \times 2$ width diff $7 \times (6-4) \times 2 = 28$)
24. $(3 \times 5 \times 8) = 120 \rightarrow$ half dims volume $(1/2)^3 = 1/8$: $120/8 = 15$
25. 2,000
26. 4.5 L
27. 2 pt
28. 1.5 qt
29. 1.5 lb
30. 5,500 g
31. 30 boxes ($(6/2) \times (4/2) \times (5/1) = 3 \times 2 \times 5$)
32. 96,000 cm³ & 96 L
33. $1,500 - (350 + 400 + 125) = 625$ mL
34. $3 \times 2 \times 0.4 = 2.4$ m³ $\rightarrow 2,400$ L
35. A:60 vs B:80 $\rightarrow$ B
36. $8,000 - (2,450 + 3,325 + 1,990) = 235$
37. 2.75 L / confused scaling to liters not milliliters
38. 60 / added not multiplied

39. $120 / (\sim) (120-70)/120 \approx 41.7\%$

40. $8 ((12/6) \times (10/5) \times (8/4) = 2 \times 2 \times 2)$

41. 0.625

42. $864 \div (12 \times 9) = 864 \div 108 = 8$

43. $4 \times 3 \times 2 = 24$; each dim $\times 1.25 \Rightarrow$ factor $1.25^3 = 1.953125 \rightarrow \approx 47$

44. $1 \times 0.5 \times 0.4 = 0.2 \text{ m}^3 = 200 \text{ L} \rightarrow 200 \div 2 = 100$

45. Varies

Accept equivalent decimal / fraction forms. Minor rounding (± 1) accepted in #43. Reflection varies.