

AP Prep Semester 2 – Numbers in Science Test Help

Please note: Check for Understanding are always more difficult than real test.

Quantitative vs. Qualitative

Qualitative vs. Quantitative

Read the following examples and then decide if each statement is Qualitative (QL) or Quantitative (QNT).

1. QL The candy was sour.
2. QNT The bug was 5 cm long.
3. QL The flower is red.
4. QNT The mass of the beaker was 122 g.
5. QNT My fingernail is 2 cm long.
6. QL The slug was slimy.
7. QL The laptop is white.
8. QNT She is 150 cm tall.
9. QL His hair is black.
10. QNT You have 3 sisters.



Use the cartoon to the right to answer below:

Make your own Quantitative Observation - The man has five fingers
 Make your own Qualitative Observation - the man is wearing a checkered shirt

Metric Conversions

Complete the following table showing the unit conversion for each of the following measurements.

Question	Measurement	Convert Units (you may write the number using scientific notation)		
1	23.6 cm	0.236 m	236 mm	2.36 × 10 ⁸ nm
2	456 mm	45.6 cm	0.456 m	4.56 × 10 ⁻⁷ Mm
3	6.89 km	6.89 × 10 ⁴ μm	689000 m	6.89 × 10 ⁸ mm
4	77.8 μm	7.78 × 10 ⁻⁵ m	0.00778 cm	7.78 × 10 ⁻⁸ km
5	0.97 m	9.7 × 10 ⁸ nm	0.00097 km	9.7 × 10 ⁻⁷ Mm
6	89.078 mL	0.089078 L	89.078 cL	89078 μL
7	8.55 L	0.00855 kL	8550 mL	8.55 × 10 ⁻⁶ ML
8	0.779 kL	799 L	7.99 × 10 ⁸ μL	799000 mL
9	2.678 kg	2678 g	267800 cg	0.002678 Mg
10	963.8 g	0.9638 kg	963800 mg	9.638 × 10 ⁴ μg
11	46666.56 mg	4666.656 cg	46.6656 g	46666560000 ng
12	952.45 Mg	9.52 × 10 ⁴ μg	952450 kg	952450000 g
13	3456.0 g	3.456 × 10 ¹² ng	345600 cg	3.456 kg

Scientific Notation

Rewrite the following in scientific notation

14) 461,000

4.61×10^5

15) 0.000000000285

2.85×10^{-10}

16) 0.000000000439

4.39×10^{-11}

17) 6,340,000

6.34×10^6

18) 36,300,000,000

3.63×10^{10}

19) 0.0000000305

3.05×10^{-8}

20) 0.000009

9×10^{-6}

21) 646,000,000,000

6.46×10^{11}

22) 0.0004

4×10^{-4}

Rewrite the following in standard notation.

23) 7×10^7

70,000,000

24) 2.03×10^9

0.00000000203

25) 7.53×10^4

0.000753

26) 4.96×10^{12}

4,960,000,000,000

27) 8.34×10^{10}

0.00000000834

28) 4.33×10^{11}

433,000,000,000

Dimensional Analysis

29) A worker unloads 9 crates every 36 minutes and is paid \$2 per crate. How much money does he make in an 8 hour shift?

$$8 \text{ hr} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{9 \text{ crates}}{36 \text{ min}} \times \frac{\$2}{1 \text{ crate}} = \boxed{\$240}$$

30) One milliliter of ink can print 50 pages of text. If you have 10 gallons, how many pages can you print? (1 gallon = 3.79 L)

$$10 \text{ gallons} \times \frac{3.79 \text{ L}}{1 \text{ gallon}} \times \frac{1000 \text{ mL}}{1 \text{ L}} \times \frac{50 \text{ pgs}}{1 \text{ mL}} = 1,895,000$$

31) Sandy is traveling at 97 km. on 102 minutes. What is her speed in miles per hour if 1 mile = 1.6 km.?

$$\frac{97 \text{ km}}{102 \text{ min}} \times \frac{1 \text{ mil}}{1.6 \text{ km}} \times \frac{60 \text{ min}}{1 \text{ hr}} = \frac{35.66 \text{ mil}}{\text{hr}}$$

32) A car gets 35 miles per gallon of gas. If the cost of gas is \$3.97 per gallon, how much will it cost to make a 485 mile trip?

$$485 \text{ mil} \times \frac{1 \text{ gallon}}{35 \text{ mil}} \times \frac{\$3.97}{1 \text{ gallon}} = \$55.01$$

Significant Figures

Determine the number of significant figures in each number

33) 4 75.02 mm

34) 2 0.0049 g

35) 4 18.90 mL

36) 2 150 cm

37) 2 12 test tubes

38) 3 150. km

Round each of the following to 3 significant figures.

39) 16.8477 L 16.8

40) 5.6732 5.67

41) 0.14986 L 0.150

42) 861.85 862

43) 5.0981×10^3 5.10×10^3

44) 0.09025011 0.0903

Calculate the answers to the appropriate number of significant figures.

45) $(23.7)(3.8) = \underline{90.}$

46) $(45.76)(0.0025) = \underline{0.11}$

47) $(81.04)(0.010) = \underline{0.81}$

48) $(6.47) \times (64.5) = \underline{417}$

49) $(43.678)(64.1) = \underline{2.80 \times 10^3}$

50) $1.678 / 0.42 = \underline{4.0}$

51) $28.367 / 3.74 = \underline{7.58}$

52) $4278 / 1.006 = \underline{4252}$

53) $0.003 / 0.123 = \underline{0.02}$