

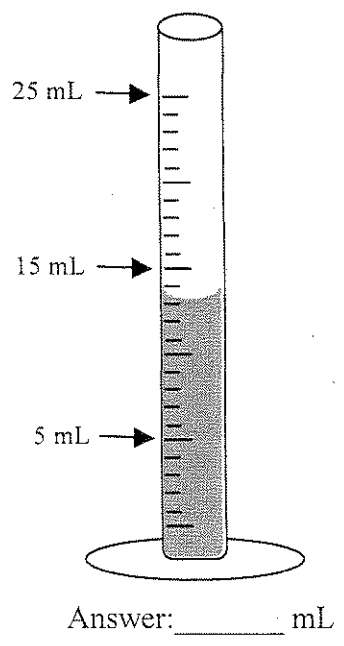
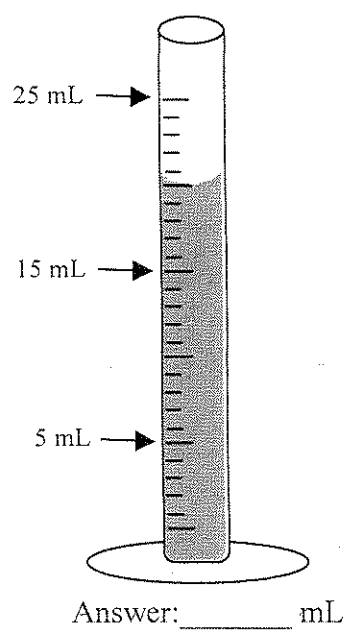
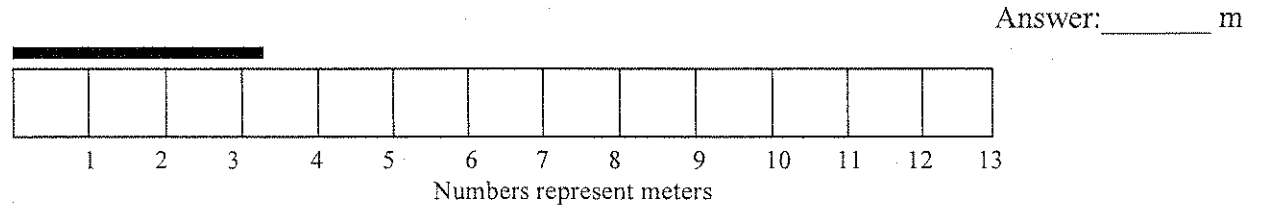
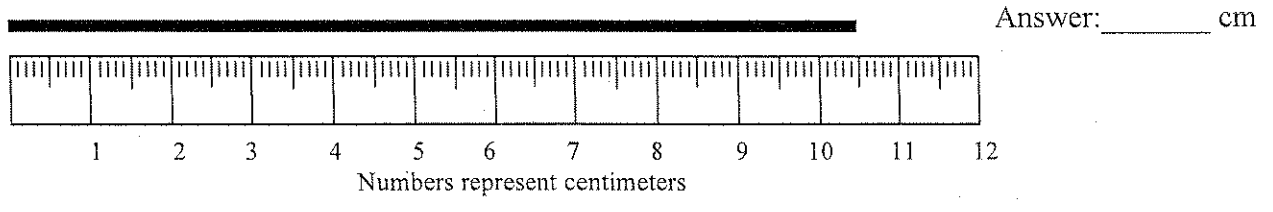
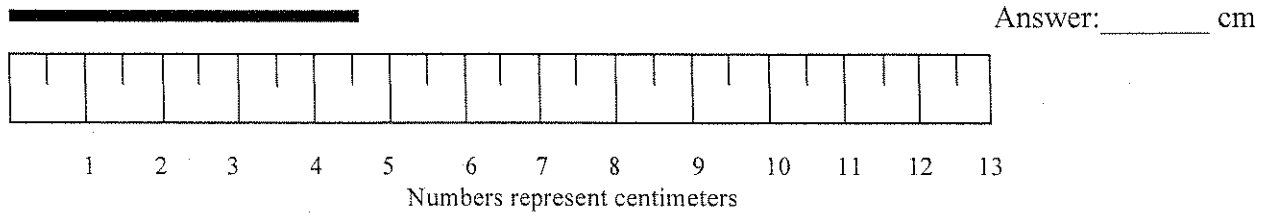
- 1) 12.0 kg = \_\_\_\_\_ g
- 2) 0.89 cm = \_\_\_\_\_ mm
- 3) 47.5 cm = \_\_\_\_\_ m

- 4) 3.56 L = \_\_\_\_\_ ml
- 5) 13.5 m = \_\_\_\_\_ km
- 6) 350 mg = \_\_\_\_\_ g

What is the correct SI base unit and metric prefix for measuring the following?

- 7. mass of a peanut \_\_\_\_\_
- 8. mass of an ant \_\_\_\_\_
- 9. Distance between New York and Portland \_\_\_\_\_
- 10. volume of a propane tank for a gas grill \_\_\_\_\_
- 11. Length of a football field \_\_\_\_\_
- 12. volume of pill container \_\_\_\_\_

13. Measure each object (shaded black) as accurately as possible to the correct number of significant figures using the units indicated on each scale.



14. a. Define accuracy –

b. Define precision –

15. Given the following data sets, rate the degree of accuracy and precision as either good or poor.

a. Target value is 21.50 g

18.73 g	26.30 g	29.21 g	11.34 g	12.56 g
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Accuracy \_\_\_\_\_

Precision \_\_\_\_\_

b. Target value is 133 cm

150 cm	151 cm	149 cm	148 cm	152 cm
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Accuracy \_\_\_\_\_

Precision \_\_\_\_\_

c. Target value is 0.030 mL

0.029 mL	0.027 mL	0.031 mL	0.032 mL	0.030 mL
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Accuracy \_\_\_\_\_

Precision \_\_\_\_\_

16. Write each given number in either decimal or scientific notation.

a)  $0.0034 =$  \_\_\_\_\_      c)  $9.81 \times 10^{-2} =$  \_\_\_\_\_      e)  $2300 =$  \_\_\_\_\_

b)  $4.05 \times 10^3 =$  \_\_\_\_\_      d)  $1.71 \times 10^{-1} =$  \_\_\_\_\_      f)  $0.00025 =$  \_\_\_\_\_

17. Perform the following operations using your calculator. Express answers in scientific notation.

a)  $(2.0 \times 10^6)(5.0 \times 10^{-3}) =$  \_\_\_\_\_      e)  $\frac{3.6 \times 10^{13}}{9.0 \times 10^3} =$  \_\_\_\_\_

b)  $\frac{(2.6 \times 10^{-3} - 2.0 \times 10^{-4})}{8.0 \times 10^{-9}} =$  \_\_\_\_\_      f)  $(4.2 \times 10^{-6})(5.0 \times 10^3) =$  \_\_\_\_\_

c)  $(5.0 \times 10^2)(5.0 \times 10^3) =$  \_\_\_\_\_      g)  $\frac{4.0 \times 10^{23}}{8.0 \times 10^{13}} =$  \_\_\_\_\_

d)  $\frac{(1.2 \times 10^{-3} - 2.0 \times 10^{-4})}{5.0 \times 10^{-8}} =$  \_\_\_\_\_      h)  $(7.2 \times 10^{-8})(3.0 \times 10^3) =$  \_\_\_\_\_

Determine the amount of significant figures in each measured quantity.

1) 17.68 mm

9) 65.66 km

2) 93.100 g

10) 42.02 cm

3) 20 kg

11) 5.4 m

4) 20. kg

12) 7.0500 kg

5) 18.54 mm

13) 41.78 km

6) 77.200 g

14) 42.02 cm

7) 70 kg

15) 7.9 m

8) 10. kg

16) 2.0900 kg

**Round 235.494 cm to the following number of significant figures**

17. 3 significant figures \_\_\_\_\_

19. 2 significant figures \_\_\_\_\_

18. 4 significant figures \_\_\_\_\_

20. 1 significant figures \_\_\_\_\_

21. **Round 0.02849 cm to 3 decimal places** \_\_\_\_\_

Solve the following problems and round the answers to the correct number of significant figures.

22)  $2.5 \text{ cm} \times 19.5 \text{ cm} =$  \_\_\_\_\_  $\text{cm}^2$

27)  $120 \text{ g} / 8.12 \text{ mL} =$  \_\_\_\_\_  $\text{g/mL}$

23)  $45.12 \text{ mL} - 13.65 \text{ mL} =$  \_\_\_\_\_  $\text{mL}$

28)  $1.25 \text{ mm} + 13.8 \text{ mm} + 123 \text{ mm} =$  \_\_\_\_\_  $\text{mm}$

24)  $3.20 \text{ m} \times 1.8 \text{ m} =$  \_\_\_\_\_  $\text{m}^2$

29)  $2500 \text{ kg} / 12.6 \text{ L} =$  \_\_\_\_\_  $\text{kg/L}$

25)  $(1.980 \times 10^{19} \text{ m}) / (3.00 \times 10^8 \text{ m/s}) =$  \_\_\_\_\_  $\text{s}$

30)  $3.67 \text{ g} - 3.13 \text{ g} =$  \_\_\_\_\_  $\text{g}$

26)  $0.0034 \text{ L} \times 2.50 \text{ mol/L} =$  \_\_\_\_\_  $\text{mol}$

31)  $45.0 \text{ g} / 2.10 \text{ cm}^3 =$  \_\_\_\_\_  $\text{g/cm}^3$

Chemistry  
LT 1.b (Scientific Measurement)

Name KEY  
Period \_\_\_\_\_ Date \_\_\_\_\_

1)  $12.0 \text{ kg} = 12000 \text{ g}$

2)  $0.89 \text{ cm} = 8.9 \text{ mm}$

3)  $47.5 \text{ cm} = 0.475 \text{ m}$

4)  $3.56 \text{ L} = 3560 \text{ ml}$

5)  $13.5 \text{ m} = 0.0135 \text{ km}$

6)  $350 \text{ mg} = 0.350 \text{ g}$

What is the correct SI base unit and metric prefix for measuring the following?

7. mass of a peanut g

10. volume of a propane tank for a gas grill L

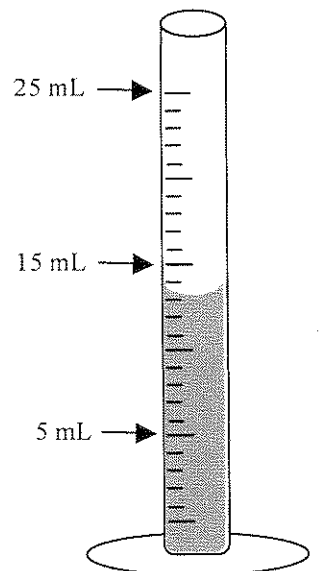
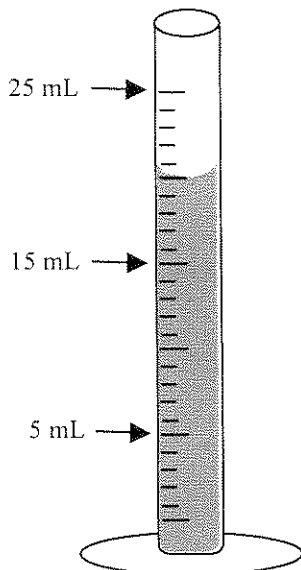
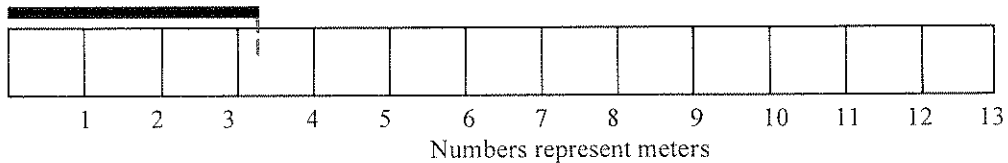
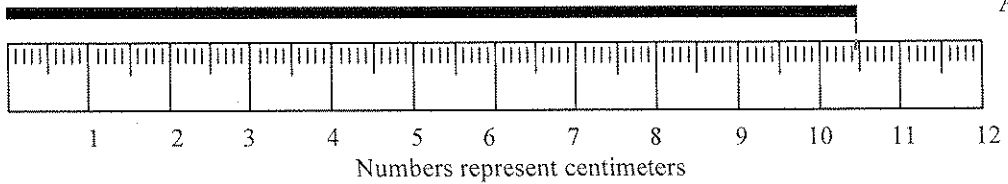
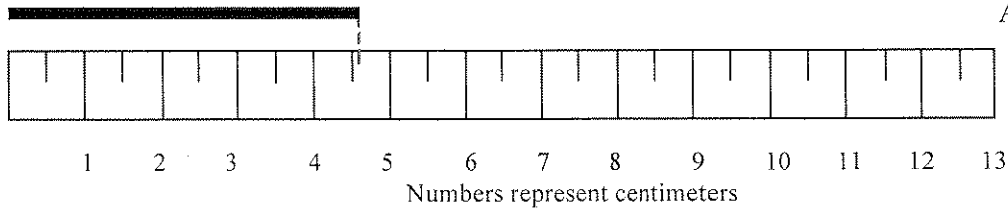
8. mass of an ant mg

11. Length of a football field m

9. Distance between New York and Portland km

12. volume of pill container mL

13. Measure each object (shaded black) as accurately as possible to the correct number of significant figures using the units indicated on each scale.



14. a. Define accuracy – How close a series of measurements is to the target or accepted value  
 b. Define precision – How close a series of measurements are to each other
15. Given the following data sets, rate the degree of accuracy and precision as either good or poor.

a. Target value is 21.50 g

18.73 g	26.30 g	29.21 g	11.34 g	12.56 g
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Accuracy Good

Precision Poor

$$\text{Ave} = \frac{18.73\text{g} + 26.30\text{g} + 29.21\text{g} + 11.34\text{g} + 12.56\text{g}}{5}$$

$$\text{Ave} = 19.63\text{g} \Rightarrow \text{close to } 21.50\text{g}$$

b. Target value is 133 cm

150 cm	151 cm	149 cm	148 cm	152 cm
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Accuracy Poor

Precision Good

$$\text{Ave} = \frac{150\text{cm} + 151\text{cm} + 149\text{cm} + 148\text{cm} + 152\text{cm}}{5}$$

$$\text{Ave} = 150\text{cm} \Rightarrow \text{not close to target}$$

$$\text{Range} = 152\text{cm} - 148\text{cm} = 4\text{cm} \Rightarrow \text{small range}$$

c. Target value is 0.030 mL

0.029 mL	0.027 mL	0.031 mL	0.032 mL	0.030 mL
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Accuracy Good

Precision Good

$$\text{Ave} = \frac{.029\text{mL} + .027\text{mL} + .031\text{mL} + .032\text{mL} + .030\text{mL}}{5}$$

$$\text{Ave} = .0298 \text{ or } .030\text{ mL} \Rightarrow \text{on target}$$

$$\text{Range} = .032\text{mL} - .027\text{mL} = .005\text{mL}$$

16. Write each given number in either decimal or scientific notation.

a)  $0.0034 = 3.4 \times 10^{-3}$

c)  $9.81 \times 10^{-2} = .0981$

e)  $2300 = 2.3 \times 10^3$

$\ll$  small range

b)  $4.05 \times 10^3 = 4050$

d)  $1.71 \times 10^{-1} = .171$

f)  $0.00025 = 2.5 \times 10^{-4}$

17. Perform the following operations using your calculator. Express answers in scientific notation.

a)  $(2.0 \times 10^6)(5.0 \times 10^{-3}) = 1.0 \times 10^4$

e)  $\frac{3.6 \times 10^{13}}{9.0 \times 10^3} = 4.0 \times 10^9$

b)  $\frac{(2.6 \times 10^{-3} - 2.0 \times 10^{-4})}{8.0 \times 10^{-9}} = 3.0 \times 10^5$

f)  $(4.2 \times 10^{-6})(5.0 \times 10^3) = 2.1 \times 10^{-2}$

c)  $(5.0 \times 10^2)(5.0 \times 10^3) = 2.5 \times 10^6$

g)  $\frac{4.0 \times 10^{23}}{8.0 \times 10^{13}} = 5.0 \times 10^9$

d)  $\frac{(1.2 \times 10^{-3} - 2.0 \times 10^{-4})}{5.0 \times 10^{-8}} = 2.0 \times 10^4$

h)  $(7.2 \times 10^{-8})(3.0 \times 10^3) = 2.16 \times 10^{-4}$

Chemistry  
LT 1.b (Scientific Measurement)

Name KEY  
Period \_\_\_\_\_ Date \_\_\_\_\_

Determine the amount of significant figures in each measured quantity.

1) 17.68 mm 4

9) 65.66 km 4

2) 93.100 g 5

10) 42.02 cm 4

3) 20 kg 1

11) 5.4 m 2

4) 20. kg 2

12) 7.0500 kg 5

5) 18.54 mm 4

13) 41.78 km 4

6) 77.200 g 5

14) 42.02 cm 4

7) 70 kg 1

15) 7.9 m 2

8) 10. kg 2

16) 2.0900 kg 5

**Round 235.494 cm to the following number of significant figures**

17. 3 significant figures 235 cm

19. 2 significant figures 240 cm

18. 4 significant figures 235.5 cm

20. 1 significant figures 200 cm

21. **Round 0.02849 cm to 3 decimal places** .028 cm

Solve the following problems and round the answers to the correct number of significant figures.

22)  $2.5 \text{ cm} \times 19.5 \text{ cm} = \underline{49} \text{ cm}^2$

27)  $120 \text{ g} / 8.12 \text{ mL} = \underline{15} \text{ g/mL}$

23)  $45.12 \text{ mL} - 13.65 \text{ mL} = \underline{31.47} \text{ mL}$

28)  $1.25 \text{ mm} + 13.8 \text{ mm} + 123 \text{ mm} = \underline{138} \text{ mm}$

24)  $3.20 \text{ m} \times 1.8 \text{ m} = \underline{5.8} \text{ m}^2$

29)  $2500 \text{ kg} / 12.6 \text{ L} = \underline{2.0 \times 10^2} \text{ kg/L}$

25)  $(1.980 \times 10^{19} \text{ m}) / (3.00 \times 10^8 \text{ m/s}) = \underline{6.60 \times 10^{10}} \text{ s}$

30)  $3.67 \text{ g} - 3.13 \text{ g} = \underline{0.54} \text{ g}$

26)  $0.0034 \text{ L} \times 2.50 \text{ mol/L} = \underline{.0085} \text{ mol}$

31)  $45.0 \text{ g} / 2.10 \text{ cm}^3 = \underline{21.4} \text{ g/cm}^3$