

Name: _____

Date: _____

Block: _____

1. Which student's data is precise? Explain your answer.

Student 1: 72.75 g, 73.34g, 73.02g, 73.25g

Students 2: 72.01g, 71.99g, 72.00g, 71.98g

2. An experiment performed to determine the density of lead yields a value of 10.95 g/cm^3 . The literature value for the density of lead is 11.342 g/cm^3 . Find the percent error.

3. How many sig figs are there in each of the following quantities?

(a) 20 kg (b) 0.0051 g (c) 11 m (d) 0.010 s (e) 90.4°C

(f) 0.004 cm (g) 0.089 kg (h) 0.009 00 L (i) 100.0°C

(j) 1.5 mL (k) 2.150 00 cm^2 (l) 5.380 000 0 s

4. Express each of the following quantities in the unit named:

(a) 5 grams in milligrams (b) 15 centimeters in meters

(c) 200 milliseconds in seconds (d) 60 grams in kilograms

(e) 0.2 centimeters in micrometers (f) 1.098 km to m

(h) 0.924 kg to mg (i) 0.705 mg to g

5. What is the difference between accuracy and precision?

6. Perform the following operations. Express each answer in scientific notation.

(a) $1100 \text{ m} + 596 \text{ m}$ (b) $32 \text{ 144}^\circ\text{C} - 800^\circ\text{C}$ (c) $32 \text{ 235 kg} / 1991 \text{ m}^3$

(d) $191 \text{ cm}^2 \times 0.0024 \text{ cm}^2$

7. Perform the following operations:

(a) $7.75 \times 10^4 \text{ m} + 4.79 \times 10^3 \text{ m}$ (b) $6.32 \times 10^{-6} \text{ kg} - 7.99 \times 10^{-7} \text{ kg}$

(c) $(9.6 \times 10^1 \text{ mL})(2.2 \times 10^{-5} \text{ g/mL})$

(d) $(39.9 \times 10^3 \text{ cm})(0.978 \times 10^{-7} \text{ cm}) \div (3.7 \times 10^7 \text{ cm})$

8. Give the number of sig figs that should appear in the answer to each of the following problems:

(a) $(0.30 \text{ kg/L})(0.0022 \text{ L})$ (b) $(0.8 \text{ kg})(1.99 \times 10^2 \text{ dollars/kg})$

(c) $(0.90 \text{ m}) \div (0.027 \text{ s})$ (d) $(0.5 \text{ kg}) \div 4.13 \times 10^9 \text{ cm}^2$

9. Express the number 56 000 in scientific notation to show (a) two sig figs;
(b) four sig figs.

(a) _____

(b) _____

10. Solve the following problems. Round your answers to the proper number of decimal places.

(a) $0.08990 \text{ dL} + 52 \text{ dL}$ (b) $0.9 \text{ s} - 0.000 05 \text{ s}$ (c) $63 \text{ km} + 93 \text{ km}$

(d) $4 \text{ dm}^3 + 6 \text{ dm}^3$

11. Several skin divers, wearing thermometers, recorded ocean temperatures while searching for a certain kind of fish. The values recorded were 10.5°C , 11.5°C , 11°C , 12.5°C , and 12°C . In how many significant figures should the average temperature be expressed?

Answer Key:

1. Student 2 has the precise data because the largest difference in values is 0.03 g while Student 1 has a 0.59g difference.

2. $\% \text{ error} = (11.342 - 10.95) \text{g} / (11.342 \text{g}) \times 100 = 3.5\%$.

3. (a) 1; (b) 2; (c) 2; (d) 2; (e) 3; (f) 1; (g) 2; (h) 3; (i) 4; (j) 2; (k) 6; (l) 8

4. (a) 5000 mg; (b) 0.15 m; (c) 0.2 s; (d) 0.06 kg; (f) 2000 μm ; (g) 1098 m;
(h) $9.24 \times 10^5 \text{ mg}$; (i) $7.05 \times 10^{-4} \text{ g}$

5. Accuracy is the closeness of a measurement to the true value. Precision tells us how close a set of measurements (for a quantity) are to another set, regardless of whether the measurements are correct.

6. (a) 1.7×10^3 ; (b) $3.13 \times 10^4 \text{ }^\circ\text{C}$; (c) $1.619 \times 10^1 \text{ kg/m}^3$; (d) $4.6 \times 10^{-1} \text{ cm}^4$

7. (a) $8.23 \times 10^4 \text{ m}$; (b) $5.52 \times 10^{-6} \text{ kg}$; (c) $2.1 \times 10^{-3} \text{ g}$; (d) $1.1 \times 10^{-10} \text{ cm}$

8. (a) 2; (b) 1; (c) 2 (d) 1

9. (a) 5.6×10^4 (b) 5.600×10^4

10. (a) 52 dL; (b) 0.9 s; (c) 156 km; (d) $1.0 \times 10^1 \text{ dm}^3$;

11. 2

