
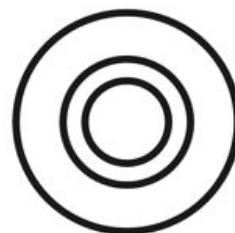


W	105 Uncertainty in Measurement	
	Objectives 105.1 Distinguish between accuracy and precision 105.2 Calculate Percent Error	

105.1 Accuracy and Precision

1. Draw three 'x' on each target to reflect the description in the table below each target.



Low Accuracy	Low Accuracy	High Accuracy
Low Precision	High Precision	High Precision

Students conducted an experiment to determine the volume of a liquid. Their results are below.

Students	Trial 1	Trial 2	Trial 3	Average
Joshua	17.4 mL	17.3 mL	17.2 mL	
Samantha	15.3 mL	17.2 mL	16.9 mL	
Alexa	16.4 mL	16.6 mL	16.5 mL	

2. If the actual volume of the liquid is 16.5 mL describe the accuracy and precision of each student.

Students	Accuracy	Precision
Joshua		
Samantha		
Alexa		

3. Explain what can account for the level of accuracy and precision in Joshua's data.

105.2 Percent Error

4. A student determines the density of zinc to be 7.56 grams per milliliter. If the accepted density is 7.14 grams per milliliter, what is the student's percent error?

5. In a titration experiment, the molarity of a base KOH(aq) was determined to be 0.95 M. The actual molarity was 0.83M. What is the percent error in the experiment?

6. A student measures the mass and volume of a sample of aluminum at room temperature, and calculates the density of Al to be 2.85 grams per cubic centimeter. Based on Table S, what is the percent error for the student's calculated density of Al?

7. In a laboratory activity, the density of a sample of vanadium is determined to be 6.9 g/cm³ at room temperature. What is the percent error for the determined value?

8. Based on data collected during a laboratory investigation, a student determined an experimental value of 322 joules per gram for the heat of fusion of H₂O. Calculate the student's percent error. Your response must include a correct numerical setup and the calculated result. [Ref. Table B]