

Exercises

1. Which time is reported with more precision? How do you know?

9:15:13

9:15

9:15:13.004

When numbers are reported with lots of digits, it suggests that the measurement is precise.

Do you have a way to determine which value is more accurate? If your answer is no, what else do you need to answer this question? NO → we need to know a standard value to compare it to.

2. A gold coin was The mass of a gold coin was measured five times. The actual mass of the coin is 25.5631 g. The results of the measurements are tabulated below.

Trial	1	2	3	4	5
Mass (g)	23.32	23.331	23.2960	23.3	23.299

- a. Are these measurements precise? Explain your answer.

Yes. The values are all grouped together

- b. Are the measurements accurate? Explain your answer.

NO. We are told the correct mass is 25.5631 g. These numbers do not match

- c. Which of these is the correct answer for the average? If they are all correct, explain why.

23.3092

23

23.31

23.309

23.30920

At this point, we cannot answer this question with confidence because we have not learned how to assess the significance of digits within a number.

Concept/Thought Questions: (technically, none are correct)

1. What are two good ways to improve

- a. the accuracy of a measurement?

- adjust the instrument being used (this is called a calibration)

- find a new instrument

- b. the precision of a measurement?

- find a new instrument that is more precise

- control the environmental variables to eliminate instrument fluctuations

2. How is precision communicated when reporting a number?

The number of digits that are being reported