

## Precision and Accuracy

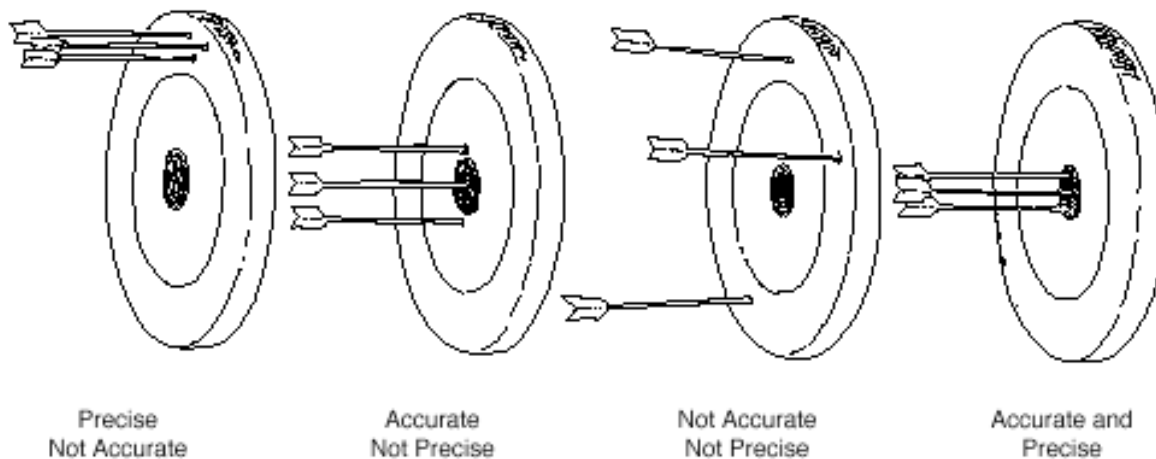
Name:	Date:
Group Members:	Block:

In science, it is very common for us to make measurements. Measurements are an important part of finding out about the world around us. To be sure that we get the right information, often we repeat our measurements. However, when an object is measured again and again, the measurements may vary. The closeness of a set of measured values to each other is called **precision**. Many people confuse precision with accuracy. **Accuracy** is a measure of how close values are to the correct value. A set of values can be in close agreement, or precise, without being accurate.

For example, suppose you repeatedly measure the mass of a 4.00-g object using an otherwise workable balance that reads too low by 3.00 g every time. You might get nearly identical readings—say, 1.00 g, 1.01 g, and 0.99 g. These readings are quite precise because they are close together. However, they differ from the correct value by a large amount, and are therefore very inaccurate. The figure below illustrates the concepts of precision and accuracy.

We use % error to determine the precision of a group of data. Small % error indicates a high degree of precision.

To determine whether or not a measurement is accurate we must know the “right” answer. This is the value that is accepted by those in charge. (example: if you look at blueprints for the school, you can find the “right” answer for the length of Main St.) Accuracy is a measure of correctness. If we don’t know that actual value, we can’t be sure if a result is accurate or not.



Class Data

Diameter of top of cup

	1	2	3	4	5	6	7	8	9	10	Average	% Diff
Measurement												
Deviation												

Length of the Room

	1	2	3	4	5	6	7	8	9	10	Average	% Diff
Measurement												
Deviation												

Height of the Room

	1	2	3	4	5	6	7	8	9	10	Average	% Diff
Measurement												
Deviation												

Length of a Battery

	1	2	3	4	5	6	7	8	9	10	Average	% Diff
Measurement												
Deviation												

Circumference of a Battery

	1	2	3	4	5	6	7	8	9	10	Average	% Diff
Measurement												
Deviation												

**Questions:**

a.) From the class results, which *group* of measurements is least precise and how do you know?

b.) From the class results, which *group* of measurements is most precise and how do you know?

c.) Make up an example of a measurement that is accurate but not precise and briefly explain.

d.) Make up an example of a measurement that is precise but not accurate and briefly explain.