



REQUIRED SKILL

Recognizing *Accuracy and Precision*

For many students, the distinction between precision and accuracy is NOT clear. A measurement can be precise, accurate, both or neither. These terms can refer to either a data set as a whole or an individual measurement.

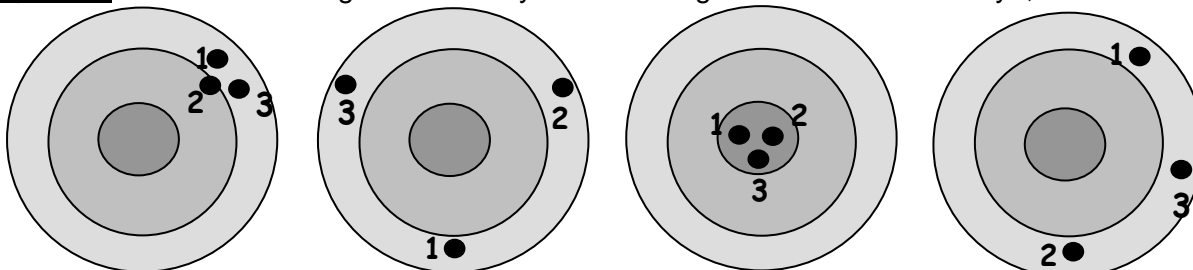
Precision

- degree of exactness to which a measurement can be reproduced (consistency)
- limited by the smallest division on the measuring device
- example: The smallest division on a meter stick is a millimeter

Accuracy

- extent to which a group of data agrees with the accepted value
- usually indicated by a percent error calculation

Example one: Consider the targets below. If your ultimate goal is to hit the bull's-eye, are these shots:



A. Precise or Accurate? **B.** Precise or Accurate? **C.** Precise or Accurate? **D.** Precise or Accurate?

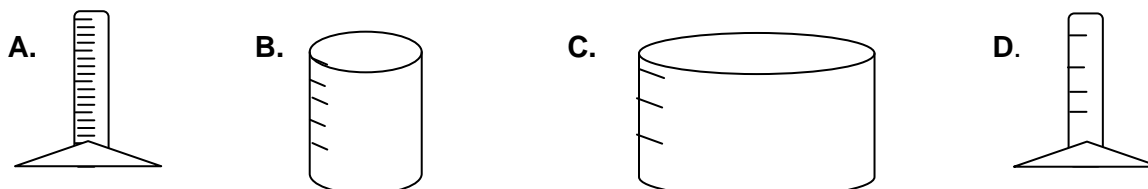
For target “A”, the shots are relatively close together, however, they are nowhere near the bull’s-eye. These shots would be considered “precise”, but NOT accurate.

For target “B”, the three shots are scattered and are therefore not precise. However, the average of the data set is accurate.

For target “C”, all three shots landed in the bull’s-eye region. Therefore, the shots are precise and all three are accurate.

For target “D”, all three shots are scattered and are not near the bull’s-eye. The shots are neither precise nor accurate.

Example two: A student is asked to measure the volume of a small steel ball. Which of the following instruments would give the most **precise** measurement?



For precision, both the *size* of the device and the *spacing of the unit divisions* are important. Therefore, the most precise measurement would be acquired with instrument “A”.