Accuracy & Precision

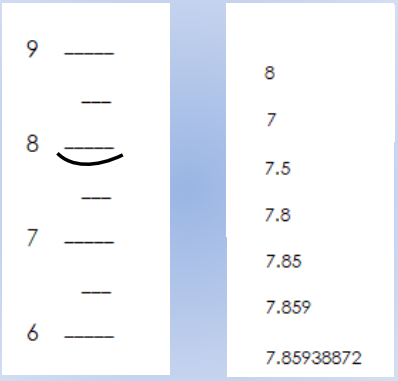
Exact v. Inexact Numbers

Accuracy

- How close a measurement is to a "true" value

Precision

- Degree of agreement between several measurements of the same thing
- An indicator of repeatability, reliability



***Every tool has a limitation!!!!**

***Every piece of data measured is an estimated value.**

***Calculated answers can never be better than the weakest piece of data used to get that answer!**

Ex: What is the density of a substance if 15 grams has a volume of 41 ml?

D = m/v
= 15 grams/41 ml
= 0.3658536 g/ml ????????

No way can your answer be accurate to the 10 millionths place!!

How many of these are legitimate?

Exact v. Inexact Numbers

- Infinite Sig Digits
  - Examples:
    - # of items
    - Metric-Metric conversion factors
    - English-English conversion factors
- Specific # of Sig Digits
  - Examples:
    - Anything that was measured
      - Mass of…
      - Volume of…
      - Temperature of…
    - Most Metric-English conversion factors
      - Exception: 1 in = 2.54 cm EXACTLY

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- Mass of index card — inexact
- # oz in a lb — exact
- Volume of cup of Starbuck's coffee — inexact
- # inches in a mile — exact
- # seconds in a week — inexact