

How to Measure with a Vernier Caliper

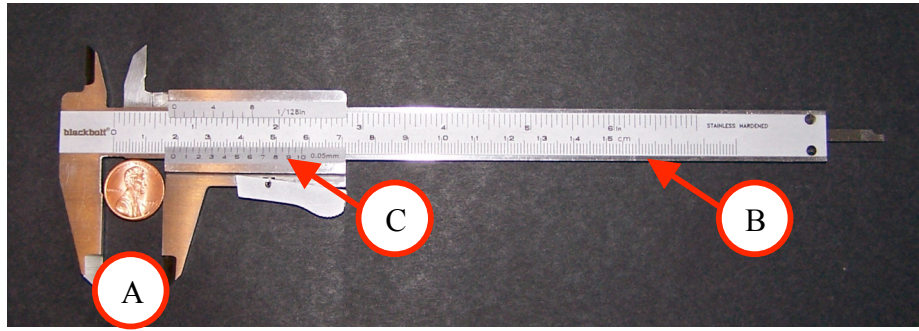
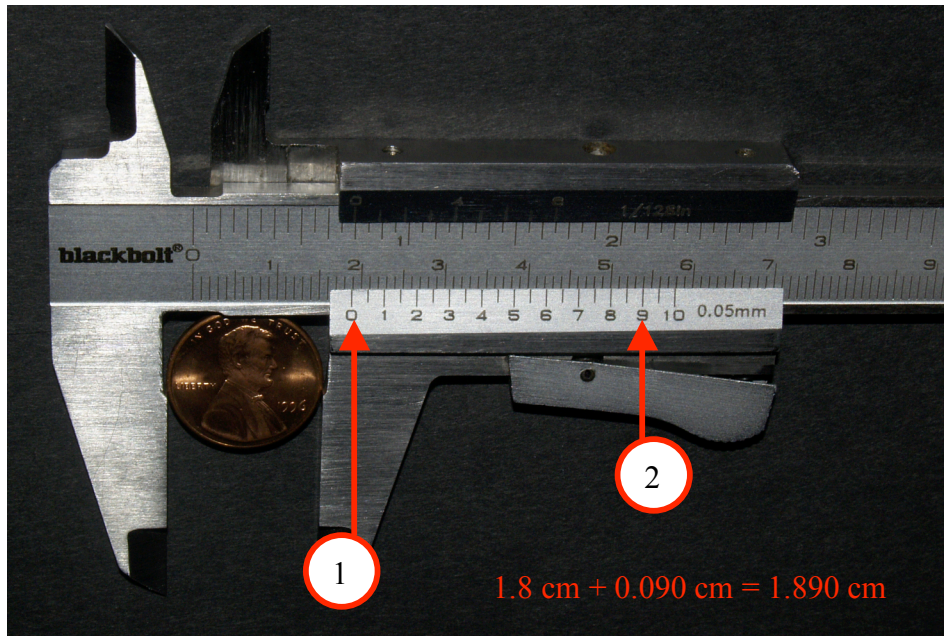


Figure 1-Vernier Caliper

- A. Inside Jaws
- B. Main scale (cm)
- C. Vernier scale (cm)

Calipers are comprised of two jaws, one attached to a fixed scale and the other attached to a sliding (Vernier) scale. In order to measure an object's width, the object is simply placed between the caliper's two jaws. The sliding tooth is then moved until the object is pressed tightly between the jaws. Using both scales, the width can be read to the nearest 0.005 cm (or 0.05 mm).

EXAMPLE MEASUREMENT



The scales are read as follows (refer to the figure above):

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- 1) Find where the 0 mark of the sliding vernier scale lines up on the fixed main scale. In this case, it is before the 1.9 cm mark. So, the first reading is 1.8 cm.
- 2) Find the mark on the vernier scale that **most** closely lines up with one of the marks on the main scale. Here, 8.5 and 9.5 are very close, but 9.0 lines up best with one of the marks on the fixed scale. This value is the number of hundredths of centimeters (or tenths of millimeters). So, the second reading is 0.090 cm.
- 3) Add the two values together to get the total reading: $1.8 \text{ cm} + 0.090 \text{ cm} = 1.890 \text{ cm}$

Given that the smallest division on the calipers is 0.005 cm (or 0.05 mm), what would be the uncertainty associated with the calipers? Remember uncertainty is rounded to one significant digit.