

Answer on Question #55250, Physics / Other

A student recorded the length of a piece of wire measured with the meter scale as 981.6cm. What is the relative error in the measurement

- A. 0.0005
- B. 0.005
- C. 0.05
- D. 0.5

Solution:

Accuracy depends on the instrument you are measuring with.

But as a general rule:

The degree of accuracy is **half a unit** each side of the unit of measure

Accurate to 0,1 m means it could be up to 0,05 m either way:

$$\text{Length} = 981,6 \pm 0,05 \text{ cm}$$

In the our task the Absolute Error is 0,05 cm.

The Relative Error is the Absolute Error divided by the actual measurement.

We don't know the actual measurement, so the best we can do is use the measured value:

$$\text{Relative Error} = \frac{\text{Absolute Error}}{\text{Measured Value}} = \frac{0.05}{981.6} = 0.00005 = 0.005 \%$$

Answer: B. 0.005