

Uncertainties in Measurements

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It is the difference between the nominal value and the
maximum or minimum value.

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Graphically,



The nominal value of x is here. (i.e. the value without considering uncertainties)

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The minimum value of x is here. (i.e. the value with the uncertainty subtracted)

Graphically,



The maximum value of x is here. (i.e. the value with the uncertainty added)

Graphically,



Δx

The uncertainty, Δx is here.

Graphically,



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and here.

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$$\Delta x \Delta x$$

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(In other words, it doesn't make sense to have an extremely *precise* measure of the *imprecision* in a value!)

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Since Alice's value has a *minimum* of $10.1 - 0.3m/s^2 = 9.8m/s^2$ and Bob's value has a *maximum* of $9.6 + 0.4m/s^2 = 10m/s^2$, we see they *both* include the range of values from $9.8 \rightarrow 10.0m/s^2$, so we say that they *agree within their experimental uncertainties*.

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In that case, we calculate the *percent difference* between the two values.