

Name _____

Significant Digits and Uncertainty Worksheet

You must get this entire worksheet exactly correct in order to receive credit for it. If your worksheet is not perfect, you will be permitted to repeat it. With each attempt, the maximum possible credit will decrease by 10%.

1. Complete the following table, expressing results from a large number of measurements in each case.

Average Measured Value	Calculated Uncertainty	How to write in abstract or report
9.81874283 m/s	0.035012 m/s	9.819 ± 0.035 m/s
7551.124 m	366.02 mm	
$6.228420 \times 10^{-9} \text{ N m}^2/\text{kg}^2$	$7.3194 \times 10^{-11} \text{ N m}^2/\text{kg}^2$	
0.00045227 kg	0.00000963 kg	
753.101 g	169.201 g	
5.24397 s	$4.9211 \times 10^{-3} \text{ s}$	

2. Two teams of experimenters are measuring some things. Do their measurements agree? Note that the numbers have not yet been rounded into presentation format...

Yankee's value	Yankee's Uncertainty	Agree (Y/N)?	Met's value	Met's Uncertainty
10.04510 s	0.141 s		10.6250 s	0.0925 s
$17.19 \times 10^{-13} \text{ m}$	$3.24 \times 10^{-15} \text{ m}$		$17.151 \times 10^{-13} \text{ m}$	$2.55 \times 10^{-15} \text{ m}$
0.0515 kg	0.0002 kg		0.0510 kg	0.0001 kg
3245.25 N	22.11 N		3265.58 N	16.3 N

3. Seven people make the following measurements for the length of a street: 422.6 m, 423.4 m, 422.8 m, 423.0 m, 423.1 m, 422.9 m, and 423.1 m. For each part, make sure you include the appropriate unit.

- (a) What is the "best value" for the length of the street (with more digits than needed for (c))?
- (b) What is the uncertainty for this group of measurements (also with lots of digits)?
- (c) From your results, write the length of the street in presentation format.