Accuracy vs. Precision

Example:

The accepted value of Ms. Bunney's head **9.8 kg**

You measure:	Accurate?	Precise?
a) 10 kg	Yes	No
b) 0.44485 kg	No	Yes
c) 9.7999 kg	Yes	Yes
d) 2 kg	No	No
e) 9.6 kg	Yes	No
f) 1.228901 kg	No	Yes

Now, write your own definition of accuracy and precision (p.28) and include an example

Accuracy: refers to the closeness of a measured value to a standard or known value. For example, if in lab you obtain a weight measurement of 3.2 kg for a given substance, but the actual or known weight is 10 kg, then your measurement is not accurate. In this case, your measurement is not close to the known value.

Precision: refers to the closeness of two or more measurements to each other (reproducible measurement). If you weigh a given substance five times, and get 3.2 kg each time, then your measurement is very precise. Precision is independent of accuracy. Precision can also refer to the number of significant figures, more precise means more significant figures.

Significant figures or significant digits: are used to give an idea of the degree of uncertainty in your measurement. Sig figs are the accurately known digits (the certain digits) plus one estimated digit.

A Significant figure is a measured or meaningful digit. They are a way for us to properly report our numbers. (p.27)

Rules for Counting Sig Figs

See if you can figure out the rule for counting sig figs

Rule 1: All non zero digits are significant

	# of sig figs?
234	3
6791	4
62	2
23.115	5

Rule 2: All zeros between non zero digits (interior zeros) are significant

	# of sig figs?
2001	4
605	3
123001	6
65.0025	6

Rule 3: Zeros don't count if they show a decimal place or how big or how small the number is
(holding a place value only)
Leading zeros are insignificant
Trailing zeros are insignificant is there is no decimal place

	# of sig figs?
0.0072	2
0.00000145	3
1200	2
68000000	2

Rule 4: Zeros count if they show a measurement was made
Trailing zeros with a decimal place

	# of sig figs?
1.50	3
86.00	4
40.0	3

Rule 5: When a number is expressed in scientific notation, all the numbers count for sig figs

	# of sig figs?
2.3×10^{2}	2
1.200×10^{-6}	4
8.00×10^{7}	3

Try Some!

	# of sig figs
a) 1.25	3
b) 0.060	2
c) 1.20×10^2	3
d) 100	1
e) 11000	2
f) 0.00000001	1
g) 820100	4
h) 0.005520	4
i) 0.45	2
j) 12500	3
k) 3.80×10^3	3
l) 1001	4
m) 0.04000	4
n) 10	1