ACT'ng on Numbers - Labeling the digits in a number to determin # of Sig Figs
Acting Rules of **Counting** Significant Figures (Sig Figs or SF)

1. **A**   ALL non-zero digits in a number are significant.

2. **C**   Captive zeros - zeros located between nonzero digits are significant.

3. **T**   Trailing zeros - zero at the end of a number **having** a **decimal point**
are significant

4. **ng**   Leading zeros - zeros that serve only to locate the position of the decimal point.
'no good' Place holder preceding are NOT significant.

Examples of ACT'ng :

800003   14.000
ACCCCA   AATTT

	# of Sig Figs
a. 800003	6 total
b. 1.21	
c. 149700 "assume"	
d. 14.000	5 total
e. 0.03995	
f. 9.999 x 10³	.

See if you can ACT on these giving ACT labels:

14.000   149700

0.3995   9.999 x 10³

ACT!'ng on Numbers - Labeling the digits in a number to determin # of Sig Figs
Acting Rules of **Counting** Significant Figures (Sig Figs or SF)

1. **A**   ALL non-zero digits in a number are significant.

2. **C**   Captive zeros - zeros located between nonzero digits are significant.

3. **T!**   Trailing zeros - zero at the end of a number **having** a **decimal point**
are significant

4. **ng**   Leading zeros - zeros that serve only to locate the position of the decimal point.
'no good' Place holder preceding are NOT significant.

Examples of ACT!'ng :

800003   14.000
ACCCCA   AATTT

	# of Sig Figs
a. 800003	6 total
b. 1.21	
c. 149700 "assume"	
d. 14.000	
e. 0.03995	
f. 9.999 x 10³	.

See if you can ACT on these giving ACT labels:

14.000   149700
AATTT   AAAAngng
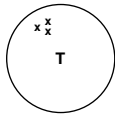
0.03995   9.999 x 10³
ngng AAAA   AAAA   exponent is
                       exactly

1
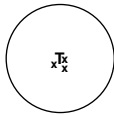
….and <u>measurements</u> will have to be made!!!!

Measurements - a system or way of gathering numerical values—size, extent, quantity, dimension–using a measuring device.

A.   Accuracy: the degree to which a measured value is close to the true value.

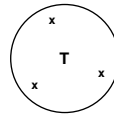B.   Precision: the degree to which a "set" of measured values agree with each other.

Compare the weigthed average of the "x's" to the value " **T**" which represents the true value. Decide which of the measurement is accurate, precise, both accurate and precise or neither.
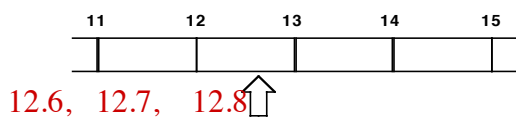

<u>precise</u>
but
inaccurate

<u>precise</u> &
<u>accurate</u>

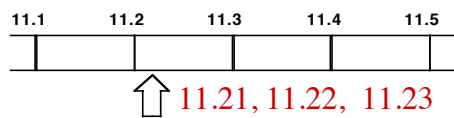inaccurate but by chance; the result of the average of the three x's will be accurate

---

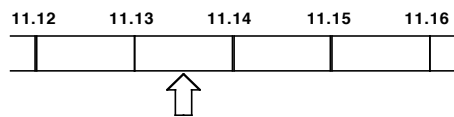# D. Measured Values & Significant Figures (with certainty):


```
   11        12        13        14        15
```
12.6, 12.7, 12.8

```
  11.1      11.2      11.3      11.4      11.5
```
11.21, 11.22, 11.23

```
 11.12     11.13     11.14     11.15     11.16
```
11.134,   11.135, 11.136

reading = $\underline{12.7 \pm 0.1}$
least reliable scale
highest uncertainty

reading = $\underline{11.22 \pm 0.01}$
more reliable scale
lower uncertainty

reading = $\underline{11.135 \pm 0.001}$
most reliable scale
least uncertainty