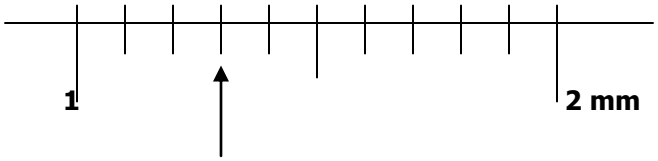
**DO NOW:**
**a) Report the length of an object that reaches the arrow below**




**Length = 1.30, 1.29 or 1.31 mm, but not just 1, 1.3, or 2 mm.**

**REMEMBER: You must estimate only 1 place past the markings on your instrument.**

## Aim: How do we calculate precisely?

1) When **multiplying and dividing,** limit and round to the least number of **significant figures** in any of the factors. In other words, for multiplying & dividing, count sigfigs to find the "weakest link"; your answer can't be stronger.

Therefore, 5.1 ← 2 sigfig, "weakest link"
213 ← 3 sigfig

0.023943662 → 0.024
2 sigfig

Another example, 2,300 x 0.987567 = 2271.4041 → 2,300
2 sigfig, 6 sigfig, 2 sigfig

**NOTE**: DON'T forget the power! 23 isn't 2,300

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2) When **adding and subtracting**, limit and round your answer to the least number of **decimal places** in any of the numbers that make up your answer. In other words, for **adding and subtracting**, count dp's to find the "weakest link"; your answer can't be stronger.

32.34 + 2.6 + 1.3412 = 36.2812 → 36.3
2 dp, 1 dp "weakest link", 4 dp, 1 dp

**NOTE:** Sometimes they'll give you a problem which requires adding/subtracting, and they'll ask you for an answer with the correct number of sigfigs. To do so, you still go by the least number of decimal places.
**GO TO HANDOUT**: Problems on front side were done in class; probs on backside were assigned for HW; Problems: i & j are a little harder

Chemistry 1 \ Chille sigfig2.mst

Aim: How do we calculate precisely?

**"a chain is as strong as its weakest link"**

So, in doing computations, the answer should be as precise as the **least** precise measurement.

1) For **addition and subtraction**, round off so that the answer has as many decimal places as the measurement with the **least** number of **decimal places.**

2) For **multiplication and division**, round off so that the answer has the same number of significant figures as the measurement having the **least** number of **significant figures**.

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Classwork: Express the answers for the following problems with the appropriate number of significant figures.

a) 32.85 x 0.017 = 0.558845 → 0.56
4 SF 2 SF 2 SF

b) 7.01 + 15.263 + 9.0 = 31.2773 → 31.3
2 dp 3 dp 1 dp 1 dp

c) 9.633 / 4.1 = 2.34951219 → 2.3
4 SF 2 SF 2 SF

d) 78 - 46.58 = 31.42 → 31
0 dp 2 dp 0 dp

e) 8.924 x 3.1 = 27.6644 → 28
4 SF 2 SF 2 SF

* f) 47.8 x 3.2 = 152.96 → 150
3 SF 2 SF 2 SF

* Don't forget the power of 10! 15 ≠ 150

g) 39.48 - 3.384 = 36.096 → 36.10
2 dp 3 dp 2 dp

h) 22.040 x 0.001 = 0.022204 → 0.02
5 SF 1 SF 1 SF

i) 100 x 4.18 x (36.7 - 32.3) → 1839.2 → * 2,000
1 SF 3 SF 1st 4.4 1 SF

2 ≠ 2000

j) $\frac{3346}{2.2\ (26.4 - 26.3)} = 15209.09091 \rightarrow {}^{*}20{,}000$

4 SF; 1 dp → 2 SF; 2 SF; 0.1 1 dp → 1 SF; 1 SF

For HW, do the problems on the reverse side →→→→→→→→→→→→→→→→

1st Do Subtraction

Then do multiplication/division