

Session 1: Combinations

Preparations

Sig Fig / Uncertainty basics

Start today's session after you can reliably:

1. count the # of sig figs in a number, and
2. convert between absolute and relative \pm

Q1

Identify the number of significant figures in:

- (a) 3408
- (b) 0.03408
- (c) 0.034080

Q2

Convert between absolute and relative uncertainties:

- (a) 300 ± 25
- (b) $300 \pm 25\%$
- (c) $0.0300 \pm 5\%$

1

Combining significant figures

$$555 + 0.1$$

$$555.0 + 0.1$$

$$555 \times 0.70$$

$$555 \times 7.0$$

Session 2: Populations

Preparations

Additional 2-3 sheets A4

You may wish to do additional calculations.

Smartphone / calculator

There are calculations that you cannot do in head

Data Booklet

Find out where to find atomic masses

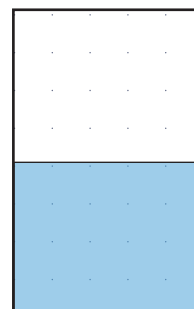
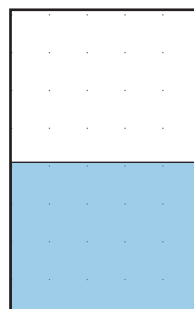
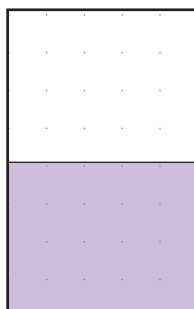
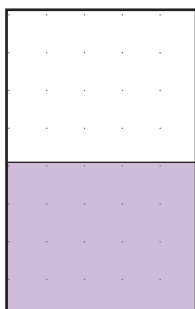
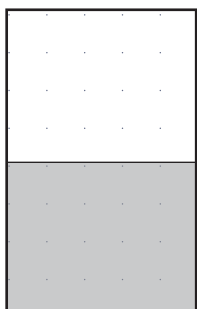
1

Mathematical equations

Describes

; uses

The symbol collection so far:



General symbol annotations



Mathematical relationships so far:

2

Chemical equations

Describes

; uses

Can be decorated with

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An elaborate example:

Homework

Add Y1W5 Anki deck

Complete the equation practice stack

Do Anki decks

Session Lab: Quiz + Measuring

Preparations

Tried practice quiz

Check your answers and learn from the mistakes. The quiz will be similar.

Smartphone / calculator

There are calculations that you cannot do in head

Data Booklet

You can bring your own copy or use one from the lab.

Dark clothing

It may get stained

Hair band

If you have long hair

Closed toe shoes

Someone else may break glass!

Computer

For entering data into class spreadsheet

1 Quiz

[1] describes one point, and can be done in 1.5 minutes.

There is a total of [10].

2 Measurement lab

In this lab you will be attempting to measure exactly 5 cm^3 volume using a variety of glassware. Collect between 3-4 trials for each.

The “goodness” of the measurements will be evaluated by measuring the mass of the liquid delivered, knowing the density of water (and thus aqueous solutions) is 1.00 g/cm^3 . Use a 10 cm^3 beaker on the balance. Dry between runs.

A class spreadsheet is given on the website for you to collect your data. The data analysis and write-up will be done on the **class** data.

Collect your own data *Today; see next page*

Enter into spreadsheet *By Friday 9 pm*

Process data

Write-up analysis *By next Sunday 9 pm.*

equipment		before	after	comments
10 cm ³ grad cylinder	1			
	2			
	3			
	4			
5 cm ³ pipette	1			
	2			
	3			
	4			
burette	1			
	2			
	3			
	4			
10 cm ³ syringe	1			
	2			
	3			
	4			
1 cm ³ micropipette (x5 times)	1			
	2			

2

Combining uncertainties

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Exact numbers

Averaging

300 ± 25
 $+ 300 \pm 25$

$300 \pm 25\%$
 $- 300 \pm 25$

300 ± 25
 $\times 300 \pm 25$

$300 \pm 25\%$
 $\div 300 \pm 25$



3

Reporting Values

	Procedure	Example

Homework

Measurements stack: Q4-7, 11-16

Reflections