Excel Tutorial

Background

The goal for this tutorial is for you to get familiar with the Excel skills we'll be using on a weekly basis. By the end of this tutorial, you should **know the basics of Excel.** I know everyone is coming in with different levels of experience here, so I want to include an Excel tutorial that will make sure everyone is up to speed here.

Groupwork restrictions

If you have a lot of Excel experience and are working in a group, you may not take charge of doing this section! Your role now is to help your less experienced groupmates figure out Excel. So you can give them advice, but they need to be in the driver's seat here.

Activity!

Get your materials

1. A group member should log into the lab computer with the following info:
    - Username: your zagmail username
      - You should not need to include the @zagmail.gonzaga.edu part.
    - Password: your zagmail password

2. Go to the PHYS104L Canvas > **Modules > Excel Resources > The Big 104L Excel Guide!** and **open the attached PDF in a new tab.** There's a bunch of stuff in here that we'll refer to throughout the semester; for now, we're going to focus on **pages 2 and 3 of the document.**

3. Go back to the list of Canvas modules and find **Modules > Lab 2 > Excel Template.** Open **02-MeasuringUnitsConversions_Template.xlsx.**
    - ★ *By default, our computers save to the Downloads folder.*
    - ★ *Save the file periodically as you work! If the computer crashes, you don't want to lose all your hard work!*

4. You should see, under the **Excel Tutorial** heading, a blue box of data and a green box of data.

Cell references

Excel uses lettered columns and numbered rows. You can see the columns labeled above the spreadsheet and the rows labeled to the left. Each cell in the spreadsheet has a column-row designation —e.g., cell C3 in your spreadsheet says *Sum*.

When doing math or manipulating data in Excel, it's fastest and easiest to work with cell references, so **I expect you to use cell references whenever possible!** Like, an "I'm grading you on it" kind of expectation.

5. In cell C4, type an equals sign (=) in the first cell of the inches column. This tells Excel that it is time to do math and use formulas.
6. Now, refer to the contents of cell A4 by just clicking on cell A4.
7. Now, add the contents of cell B4 by typing + and then clicking on cell B4.
8. Press enter. Cell C4 should now have the sum of the values in cells A4 and B4 in there!

What should you see at this point?

If you don't see the sum of the first two (x, y) values in cell C4, ask me, a partner, or an instructor for help. Otherwise, move on to the next section!

Basic math

We will continue working with the first two (x, y) values for this section.

9. Go to page 3 of The Big 104L Excel Guide! Using the basic math table as reference, fill in the remainder of row 4:
   ★ Find the difference of x-y.
   ★ Find the product of x and y
   ★ Find the quotient of x/y.
   ★ Raise x to the power of y.

What should you see at this point?

Cells C4-G4 should have values in them. You can double-check that you did your math right with a calculator and seeing if the values match up. If you're having trouble, ask me, a partner, or an instructor for help. Otherwise, move on to the next section!

Copying formulas down a column

There are four more (x,y) pairs in the blue table. You need to find the sum, difference, product, etc., for each pair. But do you want to do all of that by hand? Probably not!

Fortunately, because we used cell references, we can copy the formulas we just used in row 4 down to fill in rows 5-8. The cell references will change automatically to refer to the new rows.

10. Click on cell C4, the first sum value that you have.
11. Mouse over to the tiny green square in the lower right corner of the cell. The cursor should turn to a black crosshair.
12. Click and drag down the column as far down as you want to copy.
    ★ Instead of clicking-and-dragging, you can also double-click the tiny green square. That will autofill down the column for each value in the adjacent column.
13. Repeat this process for the Difference, Product, Quotient, and x^y columns.

Cells C4-G4 should have values in them. You can double-check that you did your math right with a calculator and seeing if the values match up. If you're having trouble, ask me, a partner, or an instructor for help. Otherwise, move on to the next section!

Not-so-basic math

Okay. Now let's move down to the green table for some more sophisticated math.

You should see a bunch of mass and radius values for a bunch of balls. Use what you just learned, along with the Basic Math and Statistics tables in The Big 104L Excel Guide!, to help you do the following:

14. For each ball, calculate the ball's volume.
    ★ Use the built-in Excel function called PI() when you do this!
15. For each ball, calculate the ball's density.
16. Find the average mass, radius, volume, and density for this set of balls.
17. Use the MIN() function to find the minimum values in the mass, radius, volume, and density columns.
18. Use the MAX() function to find the maximum values in the mass, radius, volume, and density columns.

What should you see at this point?

Below are the average, minimum, and maximum values that you should be seeing at the end of this process. If you're seeing something different, ask me, a partner, or an instructor for help. Otherwise, move on to the next section!

Average	5.858666667	0.782	2.184843649	2.699949898
Minimum	1.33	0.49	0.492806979	2.541873286
Maximum	10.97	1.01	4.315714737	2.876711672

Print your work!

I want Excel work turned in as a hard copy. I know this seems very old-fashioned and silly, but it honestly helps expedite grading *so much* and I want to get you your grades ASAP!

Here's the problem: if you just print your spreadsheet as it is, I'll get a printout full of numbers. But how do I know you actually used Excel to get any of these numbers? How do I know you're using formulas correctly if I can't see them?

Well, here's the solution: print in formula view! Here's how:

1. Make sure your work is open on the desktop version of Excel (the browser version can't print formulas properly)

2. On the toolbar, click Formulas > Show Formulas.

3. Adjust the column widths so that things print nicely!
   ★ Resize the columns to be as small as possible without cutting off your formulas. You can do this by hovering between the column labels until you see the resizing cursor, and then double-clicking.

4. Print to the lab printer (called "Herak 257 Printer" — should be the default option).
   ★ When printing, you don't want any of your tables split up over multiple pages.
   ★ If the Print Preview looks like you need to shrink things down further, play with page orientation and scaling.
      ○ At the bottom of the print menu is a dropdown for scaling. Play around with it to find a good fit --- "Fit All Columns on One Page" is a good place to start.