

# Graphing Exercises 1 & 2

## Exercise 1

**IMPORTANT:** This part of the assignment takes quite a bit of time. Make sure you plan ahead and give yourself plenty of time to complete both graphs and submit them.

**OVERVIEW OF THE ASSIGNMENT:** You will turn in these three parts for Exercise 1.

- 1) The Questions answers – typed in a Word document as Page 1
- 2) Graph 1: A hand drawn graph – scanned as an image and inserted as Page 2 into your Word document
- 3) Graph 2: A graph made in Excel and copied from Excel to your Word document as Page 3

You will first assemble all the parts into one Word document and then convert the Word document into one PDF that you will submit to BOTH your Google Drive Turn It in Assignment folder AND Turnitin.com.

**QUESTIONS:** Type your answers, double spaced, in a Word document as Page 1. For question **A**, feel free to make your own test tubes or use something like Jing or the Snip It Tool to cut and paste the test tubes in the question.

**GRAPH 1:** Construct the first line graph (*question J on the Graphing Exercise*) on a full sheet of graph paper using the guidelines on the handout, [How to Draw a Line Graph on Paper](#) (on website under Worksheet tab).

Be sure to follow the instructions on this page very, very carefully!!!!), especially paying attention to the examples of a bad graph and a good graph at the end of the handout.

### Hints for Graph 1:

- What are the independent and dependent variables? What are you purposefully changing, and what is changing as a result?
- Will you be graphing every test tube?
- You will have just one graph for this, but you'll have more than one line on the graph.

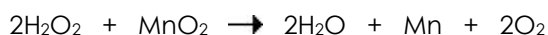
**GRAPH 2:** Construct the second graph (*question K on the Graphing Exercise*) using Excel or other data analysis software. Create a full page, scatter plot graph following the same guidelines that you will use for the paper graphs.

### Hints for Graph 2:

- Use a SCATTER plot graph and not a line graph. In Excel, line graphs connect the dots and that is a no, no!!
- **HOW TO PRINTABLE INSTRUCTIONS:** Go to our class website for a PDF with excellent instructions on "How to Make a Best Fit (Scatter Plot) Line Graph in Excel 2010"
- **HOW TO VIDEO:** Click here for a short video tutorial on making XY Scatter Plot Graphs in Excel <https://vimeo.com/137154649>
- If the instructions for making a graph on Excel are confusing, or you are using another type of data analysis software, GOOGLE IT until you find instructions that make sense to you!

## Graphing Exercise – Generation of Oxygen

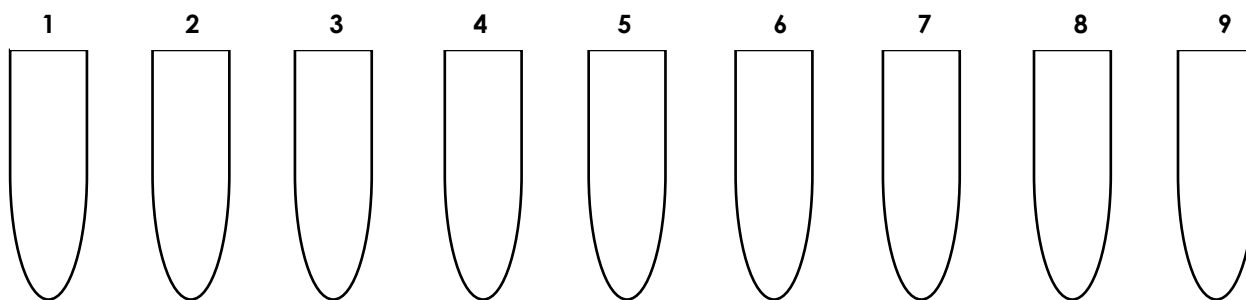
Oxygen can be generated by the reaction of hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) with manganese dioxide (MnO<sub>2</sub>).



A chemistry class sets up nine test tubes and places different masses of MnO<sub>2</sub> in each test tube. 100.0 mL of H<sub>2</sub>O<sub>2</sub> is added to each test tube and the volume of gas produced is measured each minute for five minutes. The table that follows contains the data from the experiment.

Tube #	MnO <sub>2</sub> (g)	1 min (mL O <sub>2</sub> )	2 min (mL O <sub>2</sub> )	3 min (mL O <sub>2</sub> )	4 min (mL O <sub>2</sub> )	5 min (mL O <sub>2</sub> )
1	0.1	1.4	2.6	3.5	4.2	5.1
2	0.2	2.8	4.6	5.8	7.1	7.6
3	0.3	4.9	7.2	8.8	10.2	11.3
4	0.5	5.9	8.5	10.4	11.8	13.3
5	1.0	8.5	12.4	14.4	16.1	17.1
6	1.5	11.0	14.8	17.5	19.8	21.8
7	2.0	12.0	17.0	20.2	22.7	24.8
8	2.5	13.6	19.0	22.1	24.7	27.3
9	3.0	16.2	21.8	25.1	28.2	30.4

A. Use the diagram below to label the chemicals that were added to each tube.



- B. In the experiment, what was the control? Explain why.
- C. What was the independent variable? Explain why.
- D. What was the dependent variable? Explain why.
- E. What volume of O<sub>2</sub> did tube #3 produce between the second and fourth minutes?
- F. How much O<sub>2</sub> is produced in tube #5 during the first two minutes?
- G. How much oxygen did tubes 7 and 8 produce together during the third minute?
- H. What volume of oxygen gas, in liters, was produced during this procedure?
- I. After you make the graph in question J below, answer the following: By comparing the slope of the graph curves, which tube was producing oxygen at the fastest rate between minutes four and five?
- J. Graph the amount of oxygen produced each minute in test tubes # 2, 4, and 6. (You will have one graph with three lines, one for each of these test tubes.)
- K. Make a graph using the mass of manganese dioxide and the volume of oxygen for each tube at 5 minutes – only 5 minutes! (*Careful, this one might be tricky! Hints: What are the independent and dependent variables? At five minutes, what are you purposefully changing, and what is changing as a result?*)

## Exercise 2

It is important that you be able to interpret data that is represented in graph form. Use the following link to go to the online worksheet where you will practice reading and interpreting graphs and charts. Make sure you complete all parts of the worksheet and click **Submit** when you are finished.

<https://goo.gl/forms/3hYmhi9VBUOeJRMz1>