

Joe Smith, C1

Lab Partner: Sarah Jones

8/8/13

[Title Here]

**OBJECTIVE:** This should be one to three sentences explaining the purpose of this lab.

**PROCEDURE:** Your procedure will include two parts, a written part and also images from the experiment.

### **Part 1: Written Procedure**

Each separate step should be written in a separate “mini-paragraph” and may not be numbered; however, if your lab has different parts, you should label the separate parts. Include step by step information about how the lab is to be done, including the amounts of materials, etc. In the procedure, refer to the labeled images that you will include next.

Write as if your audience is another student who is following your report to do the lab. You may not cut and paste the procedure from the lab instruction sheets. Also, be sure to include any modifications that you made as you did the experiment.

### **Part 2: Images**

Second, insert and label relevant images from the experiment, including the set-up(s), you and your lab partner following the procedure, etc. Lab partners may share images with each other; however, one lab group may not share images with any other lab group.

You may use your cell phone or a digital camera to capture your images. You are encouraged to keep your electronic device away from the lab station, unless you are immediately taking pictures. Don't forget to label your image(s). Images may not be larger than 4 inches either in height or width. (Refer to Figures 1 and 2 below.)

**Figure 1: Really Hot Step**



**Figure 2: Interesting Lab Procedure**



OBSERVATIONS: What you observed in the experiment will most often be presented in two or three parts:

Part 1: Labeled Data & Calculation Table(s)

Data and calculation tables should be labeled. Also, each column should have a heading that describes the physical quantity that is recorded in the column. The column heading should also show the units of the physical quantity. Numerical values recorded in the table should be rounded to the appropriate number of significant digits.

Tables may be created directly within the lab report, or they may be created in another source and pasted in to the lab report, i.e., Excel, Google Docs, etc., (see Data Table 1 below). Always show labeled calculations under the calculations table. You also scan a written copy of your data and/or calculations and insert it into your lab report (see Data Table 2).

**Data Table Sample 1: Volume vs. Height of Water Level**

Volume filled in (mL)	Height of Water Level (cm)
0	0
250.0	4.00
500.0	6.65
750.0	9.10
1000.0	11.71
1250.0	14.27
1500.0	16.89

**Data Table Sample 2: Handwritten Observations & Calculations, Scanned and Pasted**

Position Measurements from Spark Tape		
i	Time (s)	Position (cm) ± 0.02 cm
11	11/60	15.78
12	12/60	16.39
13	13/60	17.02
23	23/60	24.33
24	24/60	25.16
25	25/60	26.00
35	35/60	35.26
36	36/60	36.28
37	37/60	37.30
47	47/60	48.52
48	48/60	49.76
49	49/60	51.03
59	59/60	64.25
60	60/60	65.61
61	61/60	67.04
71	71/60	82.22

CALCULATIONS	
Displacement	
$\Delta x_i = x_{i+1} - x_{i-1}$	
$\Delta x_{12} = x_{13} - x_{11} = 17.02 - 15.78$	
$\Delta x_{12} = 1.24 \text{ cm}$	
Uncertainty in displacement	
$\delta_{\Delta x} = \delta_{x_{i+1}} + \delta_{x_{i-1}} = .02 + .02 = .04 \text{ cm}$	
VELOCITY	
$v_i = \frac{\Delta x_i}{\Delta t}$	
$v_{12} = \frac{\Delta x_{12}}{\Delta t} = \frac{1.24 \text{ cm}}{1/30 \text{ s}} = 37.2 \text{ cm/s}$	

## OBSERVATIONS: *(continued)*

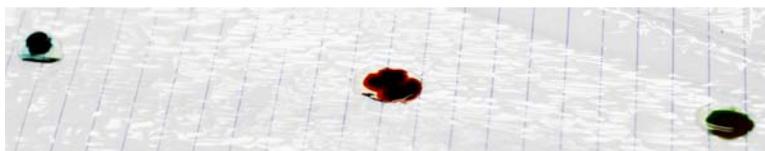
### Part 2: Images

Insert and label relevant images of the results of the experiment. This may mean a series of images depicting the results of each step, or you may be able to include an image of the final result. Ask.

You may use your cell phone or a digital camera to capture your images. You are encouraged to keep your electronic device away from the lab station, unless you are immediately taking pictures. Don't forget to label your image(s). Images may not be larger than 4 inches either in height or width.

Lab partners may share images with each other; however, one lab group may not share images with any other lab group.

**Figure 1: Reactivity of Halides**



Part 3: Depending on the experiment, you may need to include sentence or “mini-paragraph” observations.

**CONCLUSION:** Include a paragraph(s) explaining what you learned from the lab and the interpretations you can draw from the data you gathered. Also, include in this section explanations for any error you may have had in your lab. You must have a minimum of three sentences in your conclusion.

**QUESTIONS:** This is the one time you will use a numbered list! If the lab sheet had questions at the end, you will answer them here. Number the questions, and then answer each in a complete sentence. *Give the answers only, not the questions, in complete sentences.*

**GRAPHS:** Your lab report may or may not include a graph(s). Graphs must be full page size.

Graphs should either be prepared on the computer with software such as Excel, or you may draw it by hand and scan it into the computer. You should adhere to the following guidelines when preparing a graph.

1. *Title* – Every graph should have a title which identifies the graph by a number along with some descriptive text that tells exactly what is plotted, for example, *Graph 1: Velocity vs. Time*.
2. *Axes and Axes Labels* – Both axes should be labeled with descriptive text that tells both the name of the physical quantity that is plotted on that axis and the units of that physical quantity, for example, *Velocity (cm/s)*.
3. *Size and Clarity* – All graphs should be printed at a size that is sufficiently large so that the information can be easily read. This means you will need to turn your graphs to make them occupy most of the printed page. Choose axes limits so that the region of interest occupies most of the graph. Choose font sizes that are sufficiently large to be easily readable.
4. *Graph Modes* – You should adjust the graph mode so that individual data points are shown with some form of marker or with dots. Data values should never be connected with a jagged line, but instead show relationships that represent the **best fit** to data using lines with no markers (*see Graph 1 below*).

Graph 1: Velocity vs. Time

