Rice Center for Engineering Leadership | RCEL
COMMUNICATION

Using Tables and Figures in Written Documents

Handout for ELEC 240

9/6/16

Rice Center for Engineering Leadership | RCEL
COMMUNICATION

Using Graphics in Papers and Reports - Students

When to use graphics? Graphics (tables and figures) should illustrate and/or clarify information important to your arguments. They should include ONLY necessary content. Simplicity is a key to effective graphics.

Tables are useful to present large sets of data, to compare individual values, to present precise values, and to present multiple units of measure.

Figures, such as **graphs, charts, drawings, photos, screenshots, maps**, etc., are used to communicate trends, patterns, relationships, processes, or to display complex data in simple ways.

Graphics Key Rules Checklist

- — Every table and figure MUST be referenced to in the text. Text needs to to explain visuals and place them in the context.
- — Reference figures BEFORE they appear on a page.
- — TABLE titles and captions are placed ABOVE a table.
- — FIGURE titles and captions are placed BELOW the figure.
- — Figures and tables are numbered INDEPENDENTLY, in order in which you refer to them in the text. (Figure 1. … Figure 2.) (Table 1. … Table 2.) The word "Figure" and "Table" are often bolded and followed by a colon or a period. (**Figure 1:** Two common types of current: (a) direct current (DC) (b) alternative current (AC).) or (**Table 1.** Common circuit elements and their representation in an electric circuit.)
- — Use INFORMATIVE captions. Captions need to provide enough information to allow readers to interpret figures without having to read the document. Don't be afraid of longer, informative captions. (Captions should be single-spaced.)
- — Figures should be (most of the time)
  - — Centered on the page
  - — Reasonably sized, preferably taking no more than ½ page
  - — Set apart from the text by at least one blank line; text should not flow around figures
  - — Displaying well in color or gray scale. (For example: use patterns in line graphs instead of colors.)
- — Make sure that
  - — All information is accurate

- Axes are labeled
- Units are correct and clearly displayed
- Font sizes, line thickness, spacing of elements, and proportions help readability, clarity, and interpretation
- All figures have consistent look

— Center equations. Number equations on the far right of the page.

$$(x+a)^n = \sum_{k=0}^{n} \binom{n}{k} x^k a^{n-k} \qquad (1)$$

— Place labels and legends as close to your data as possible

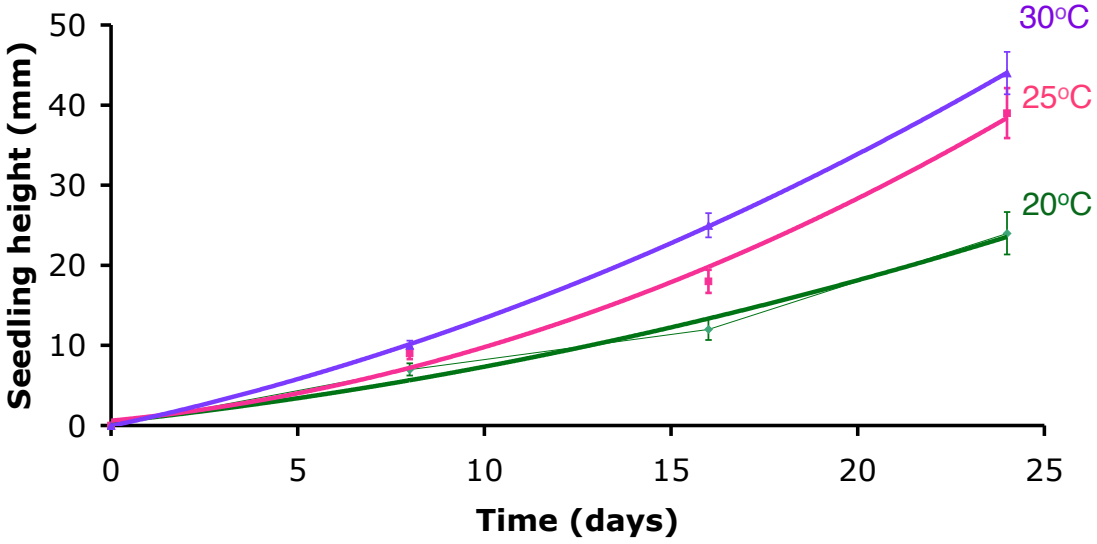


Figure 1: Seedlings grew most rapidly at 30°C

From Cain Project

— Visually mark significant features on graphs

Cite all your sources! If you recreated or adapted a figure or table from another author, include the words "Adapted from" or "After" followed by the author's name and a citation at the end of the caption.

Move page numbers to the bottom of the page,

Annotated lab report sample for ELEC 240 - Students

[redacted]

Pre-Lab

Don't indent first lines. Prior to Lab 4, we familiarized ourselves with the concepts and examined the instructions for the lab in order to build up a sense of excitement and purpose.

This is a very general statement. Explain more. What were the concepts you examined and what was the overall purpose of the lab.

During Lab

Objective

To learn basic op-amp design principles and understand the limitations of their use in practical applications.

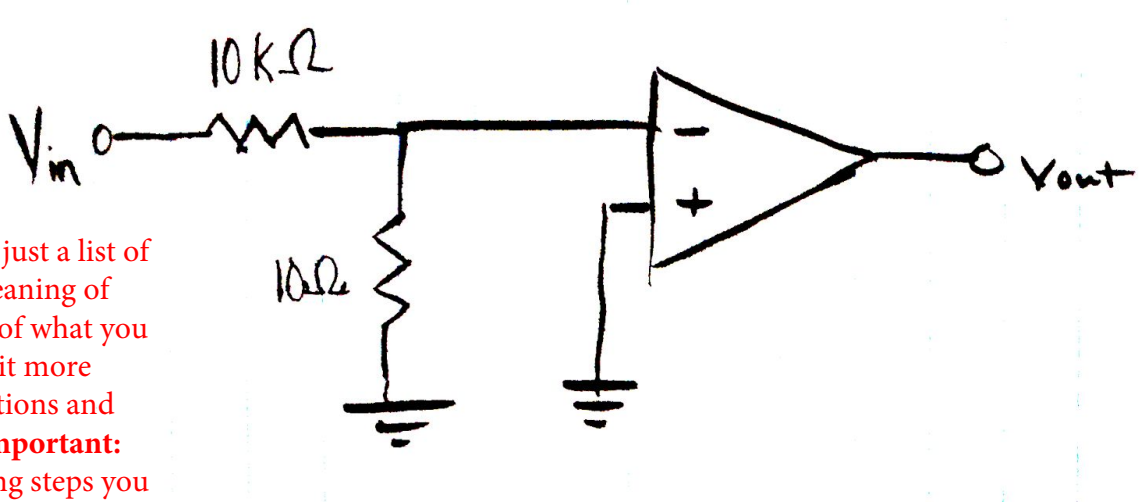
Procedure

Experiment 1.1: *The 741 Op-Amp*

Explain more. What are you planning to learn in Experiment 1.1, in the context of your overall objective.

Part A:

1. Attach the breadboard bus strips to the +15V and -15V rails.
2. Attach an LM741 op-amp to the board, and connect its Vcc (+/-) pins to the rails.
3. Configure the NI power supply to supply +15V and connect it to the correct adapters on the breadboard module.
4. Wire the following circuit (in figure 1): Capitalize word: Figure



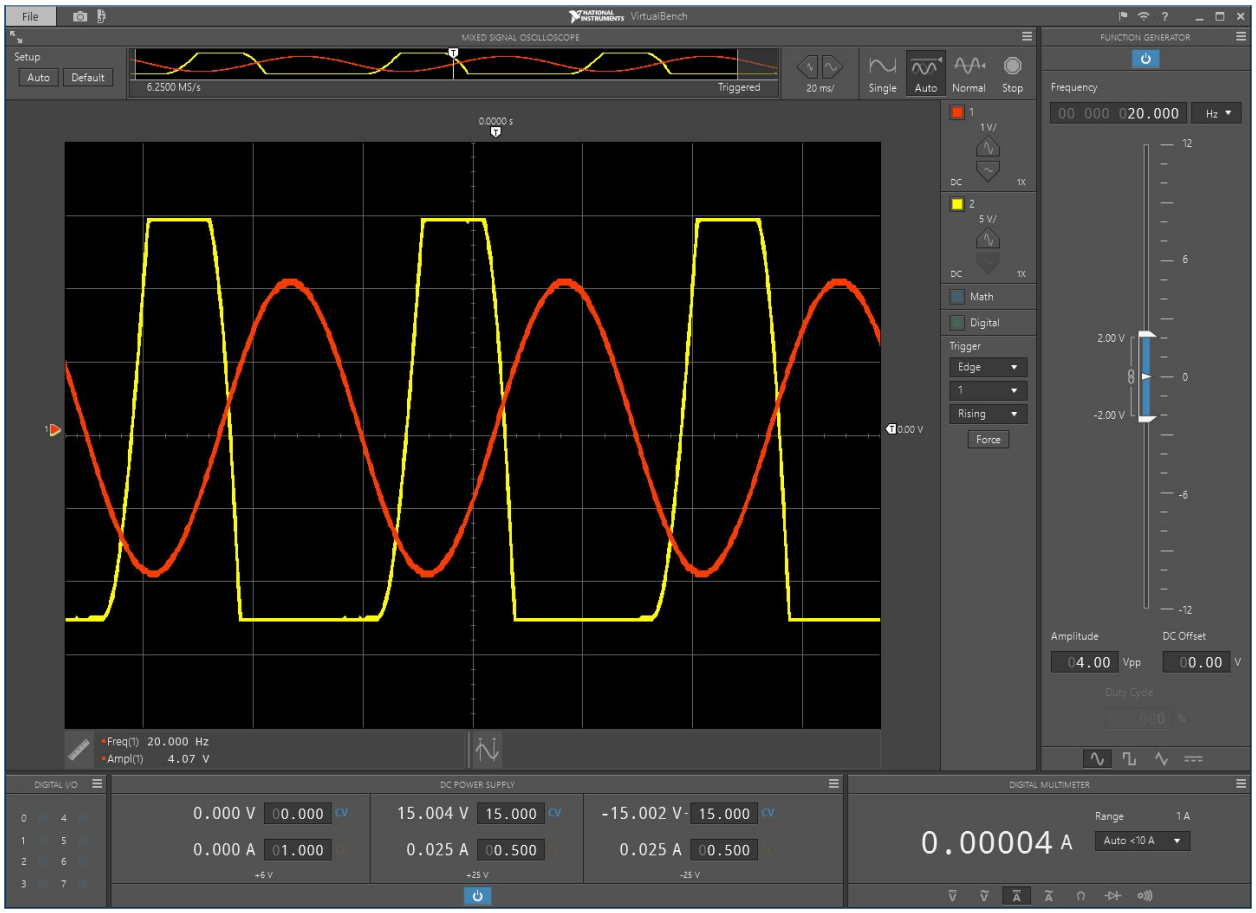
RE: Part A above: This is just a list of steps. Can you explain meaning of these steps in the context of what you are trying to learn? Make it more personal. Include expectations and reasons why you did it. **Important:** Include any troubleshooing steps you took.

Figure 1: A simple op-amp circuit Move Figure 1 caption up to page 1

5. Use the function generator to generate a 2Vpp sine wave.
6. Connect the function generator to both V_{in} on the breadboard and the oscilloscope channel 1 input.
7. Connect oscilloscope channel 2 to V_{out}.
8. Turn on the power supply and note the channel 2 waveform output relative to the channel 1 output. Record the peak values of V_{out}. The amplified waveform appears clipped. The clipped channel 2 waveform has a peak-to-peak amplitude of 27.7V (15V+, 12.7V-). See Figure 2 for the waveform.

Nice introduction of the Figure in text.

Analyze and reflect more: What does it mean for your purpose? What did you learn?



Add interpretation in the caption.

Figure 2. Input waveform (Channel 1, red) and clipped output waveform (Channel 2, yellow)

9. Connect a 100 Ω resistor between ground and V_{out}. Observe the change in the waveform. The waveform is still clipped, but the amplitude is significantly lower. Furthermore, our signal appears to have a lower duty cycle. See Figure 3 for the new circuit and Figure 4 for the waveform.

Needs more space between the screen shot and the text.